Published in final edited form as:

Rehabil Psychol. 2014 May ; 59(2): 242–246. doi:10.1037/a0036294.

Brief report of affective state and depression status after traumatic brain injury

Shannon B. Juengst, PhD, CRC^{1,2}, Patricia M. Arenth, PhD², Ellen M. Whyte, MD^{2,3}, and Elizabeth R. Skidmore, PhD, OTR/L^{1,2}

¹Department of Occupational Therapy, School of Health and Rehabilitation Science, University of Pittsburgh, Pittsburgh, Pennsylvania

²Department of Physical Medicine and Rehabilitation, University of Pittsburgh Medical Center, Pittsburgh, Pittsburgh, Pennsylvania

³Department of Psychiatry, University of Pittsburgh, Pittsburgh, Pennsylvania

Abstract

Objective—To examine the relationship between affective state (positive and negative affect) and depression status among adults with chronic traumatic brain injury (TBI).

Research Method—This is a cross-sectional cohort study of community-dwelling adults with chronic TBI (n=64) that assesses the relationship between affective state (positive and negative affect), using the Positive and Negative Affect Schedule (PANAS), and depression status, categorized as no depression, history of depressive episode, and current depressive episode, using the Primary Care Evaluation of Mental Disorders (PRIME-MD).

Results—Affective state differed significantly across depression status groups for both positive affect ($F(2, 61) = 5.10, p = .009$) and negative affect ($F(2, 61) = 8.19, p = .001$). Participants with no depression reported higher positive affect ($M = 35.67, SD = 9.08$) than those with a current depressive episode ($M = 27.64, SD = 8.59, p = .007$) and lower negative affect ($M = 14.52, SD = 5.08$) than those with a history of a depressive episode ($M = 20.21, SD = 5.08, p = .006$) or those with a current depressive episode ($M = 22.29, SD = 6.21, p = .001$).

Conclusions—Poor affective state, including both low positive affect and high negative affect, is associated with depression diagnosis. High negative affect is present, even in the absence of a current depressive episode, after TBI. These data highlight the need to assess affective state in addition to screening for mood disorders among adults with chronic TBI.

Keywords

Positive Affect; Negative Affect; Depression; Brain Injury

Introduction

Difficulties with mood and affect after traumatic brain injury (TBI) are prominent and more common than in the general population (Dikmen, Bombardier, Machamer, Fann, & Temkin, 2004; Gordon et al., 2006; Jorge et al., 1993; Ownsworth & Oei, 1998). A review of the literature suggests the prevalence of major depressive disorder after TBI averages 30% (Gordon et al., 2006), with 60% of individuals with major depressive disorder after TBI experiencing a co-morbid anxiety disorder (Bombardier et al., 2010). Post-TBI neuropsychiatric disorders, such as major depression and anxiety disorders, are negatively associated with long-term functional, psychosocial, quality of life, and health outcomes, regardless of injury severity or time since injury (Bombardier et al., 2010; Bowen, Neumann, Conner, Tennant, & Chamberlain, 1998; Gordon et al., 2006; Hart et al., 2011; Jorge, Robinson, Starkstein, & Arndt, 1994). These psychiatric symptoms may persist even decades after injury (Anstey et al., 2004). Furthermore, as demonstrated in studies in late-life depression, individuals with subclinical depressive symptoms are lower on a continuum of well-being and functional status compared to those with no depression (Beekman, Deeg, Braam, Smit, & Van Tilburg, 1997; Beekman et al., 2002; Lyness, King, Cox, Yoediono, & Caine, 1999). Additionally, individuals with minor depressive symptoms after TBI are at greater risk for developing major depression (Hart et al., 2012).

Mood refers to an individual's overall emotional or affective state (Gray & Watson, 2001). An episode of depression is an example of a long-term disturbance (or disorder) in mood. Affect refers to emotional reactions to specific experiences, and as such, is relatively independent of mood status (Gray & Watson, 2001). Nevertheless, Clark and Watson (1991) have suggested that the distinguishing affective symptom of a depressive episode is low positive affect (lack of energy, loss of interest) whereas high negative affect (nervousness, distress, hostility) may be present in either depression or anxiety disorders (Clark & Watson, 1991; Clark & Watson, 1991a; Dikner et al., 2004). In addition, the combination of low positive affect and high negative affect may persist even after resolution of the depressive episode (Clark & Watson, 1991; Dikmen et al., 2004). While these complex relationships between affective state and depressive disorders have been established in the general population, there are no studies that have specifically explored the persistence of poor affective state and its relationship to depressive episodes among individuals with chronic TBI.

The purpose of this brief report is to assess the relationship between affective state (positive affect and negative affect) and depression diagnosis among adults with chronic TBI. We hypothesized that those individuals with a history of a depressive episode and those with a current depressive episode would demonstrate a poorer affective state – defined by low positive affect and high negative affect – as compared to individuals with no history of or current depressive episode.

Methods

This was a secondary data analysis of a cross-sectional study examining long-term outcomes after TBI. This current report investigates the association between affect (positive affect and

negative affect) and depression diagnosis in a sample of adults with a history of complicated mild to severe traumatic brain injury (TBI).

Participants

Individuals were recruited through existing collaborations with a University-affiliated rehabilitation institute, its associated research registry, and through local agencies and support groups for individuals with TBI.

Individuals were included if they had a history of complicated mild to severe traumatic brain injury (Glasgow Coma Scale (Teasdale & Jeannette, 1974) score 3–15 with neuroradiologic findings or significant functional compromise to require ongoing specialized services; Harrison-Felix, Newton, Hall, & Kreutzer, 1996) sustained greater than 6 months ago, were 18 years old or older, and lived in a private or group residential setting. Individuals were excluded if they had a history of any condition resulting in progressive cognitive decline (e.g., Alzheimer's disease), acute episode of psychosis or mania, or were currently involved in injury-related litigation.

Written informed consent was obtained from the participants in accordance with the University Institutional Review Board's procedures. Proxy consent was used for individuals who lacked capacity to consent only when individuals willingly assented to the study.

Measures

Demographic data were assessed through interview. Injury severity was determined using Glasgow Coma Scale scores obtained at time of injury via medical record review or via documentation sufficient to complete a post hoc assessment. The scaled total score of the Mayo-Portland Adaptability Inventory (MPAI), a validated disability measure for adults with TBI (Malec, 2005), assessed overall disability. While this tool does include individual items assessing depression and anxiety, the total scaled score includes 26 total items measuring disability more broadly. The Primary Care Evaluation of Mental Disorders (PRIME-MD) depression section, including the nine questions on the Patient Health Questionnaire (PHQ-9) but in a Yes/No format, was used to determine depression status (Spitzer et al., 1994). This is a valid and reliable screening tool for major and minor depressive episodes after TBI (Bombardier et al., 2010; Fann et al., 2005). Participants were categorized into one of three categories: no history of depressive episode, a prior depressive episode but no current episode (history of depressive episode), or a current depressive episode (those with major and minor depressive episodes were combined to maximize power, after it was established that these groups did not differ on any measured factors). The Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988) was used for assessing positive and negative affect. Higher total scores on the positive affect subscale (10 items, score range 10–50) indicate high energy, concentration, and positive engagement, and lower scores indicate sadness and lethargy. Higher scores on the negative affect subscale indicate higher anger, disgust, guilt, fear, and nervousness, and lower scores indicate calmness and serenity (Watson et al., 1988). All assessments were administered by a trained rehabilitation counselor (S.J.) and supervised by a psychiatrist with stroke expertise (E.W.).

Data Analyses

Statistical analyses were performed using SPSS19.0™ for Windows. We first examined descriptive statistics, including means and standard deviations for continuous variables and frequencies and percentiles for categorical variables. We then conducted one-way ANOVA and Bonferroni post hoc analyses to assess differences in positive affect and negative affect between depression status groups.

Results

Recruitment

Of 115 individuals who initially responded or were contacted to participate in the parent study, 71 were found to be eligible after initial telephone screening. Seventy participants provided informed consent, of which 65 were found to be eligible and completed study assessments. Since one participant failed to complete the PANAS, 64 participants were included in this report.

Descriptive Data

Descriptive data for this sample are presented in Table 1.

Participants had a mean age of 46 (SD = 17) years and a median time since injury of 50 (range = 13–104) months. The sample was 80% male and 97% white. Approximately one-fifth (22%) of the sample met criteria for a current major (14%) or minor depressive episode (8%), with an additional 45% reporting a history of a (but not a current) depressive episode and 33% reporting no history of depressive episode. In terms of descriptive measures, the groups differed significantly with regard to race and disability. There were only two non-white participants in this sample, and both were in the current depressive episode group. With regard to disability, those with no depression reported significantly less disability than those with a history of a depressive episode ($p = .005$) or those with a current depressive episode ($p = .001$).

Compared to a validation sample from the general adult population ($n = 1,003$), who demonstrated average positive affect of 31.31 (SD = 7.65) and negative affect of 16.00 (SD = 5.90) (Crawford & Henry, 2004), the present sample of adults with chronic TBI had similar positive affect ($M = 32.67$, $SD = 7.77$) and slightly higher negative affect ($M = 18.80$, $SD = 6.77$).

Affective State by Depression Group

Results from the one-way ANOVA are summarized in Table 1. Post hoc analyses indicate that participants with no depression ($M = 35.67$, $SD = 9.08$) reported significantly higher positive affect than those with a current depressive episode ($M = 27.64$, $SD = 8.59$; $p = .007$). Those with a history of depressive episode reported positive affect scores ($M = 32.93$, $SD = 4.81$) that fell between those with no depression ($M = 35.67$, $SD = 9.08$) and those with a current depressive episode ($M = 27.64$, $SD = 8.59$), though there were no statistically significant differences. Participants with no depression ($M = 14.52$, $SD = 5.08$) reported significantly lower negative affect than either those with a history of depressive episode (M

= 20.21, SD = 6.71, $p = .006$) or those with a current depressive episode ($M = 22.29$, SD = 6.21, $p = .001$). Those with a history of depressive episode ($M = 20.21$, SD = 6.71) reported similar negative affect to those with a current depressive episode ($M = 22.29$, SD = 6.21; $p = .900$).

Discussion

Our findings demonstrate that among individuals with chronic TBI, the presence of low positive affect and high negative affect is associated with a current depressive episode. In addition, these findings suggest that low positive affect/high negative affect persists even after resolution of a major or minor depressive episode. Participants with no depression reported the best affective state, whereas those with a current depressive episode reported the poorest affective state, as would be expected. What is notable is that those with a history of depressive episode who did not currently meet criteria for a major or minor episode evinced levels of high negative affect comparable to those who met symptom criteria for a current depressive episode.

Our findings suggest that, even after individuals no longer meet the symptom burden required to be diagnosed with a current depressive episode, they continue to experience high levels of negative affect (e.g., anger, guilt, nervousness). This is consistent with previous research indicating that high levels of anxiety and negative affect are associated with TBI (Anstey et al., 2004). Among those with a current depressive episode, positive affect (e.g., positive engagement, concentration, high energy) was significantly lower than those with no history of depressive episode, consistent with Clark and Watson's model identifying low positive affect as a hallmark symptom of depressive disorders (Clark & Watson, 1991).

These findings confirm that, among individuals with chronic TBI, higher negative affect may persist even after resolution, either through treatment or natural recovery, of a depressive episode. Clinicians providing services to individuals with chronic TBI should therefore attend not only to active depressive and anxiety symptoms, but also to high levels of negative affect that are generally not detected by many depression screening tools. This may be particularly important among individuals with a history of depressive episode, as these individuals were found to be experiencing higher negative affect than those with no history of depressive episode.

In this cross-sectional study, we can only speculate as to the cause of this finding. One potential explanation for the chronicity of the high negative affect may be the presence of or history of an anxiety disorder. Unfortunately, we did not assess for anxiety in this study. Anxiety disorders are a frequent co-morbid condition of depressive disorders after TBI (Gordon et al., 2006), and the affect common to each of these disorders often make them difficult to distinguish from one another (Clark & Watson, 1991). Clark and Watson (1991) theorize that low positive affect is the distinguishing symptom of depressive disorders, whereas high negative affect may occur in both depressive and anxiety disorders.

Another potential explanation is that individuals who reported a history of depressive episode had not achieved full remission from their depressive episode. Hence, these partial

remitters may be continuing to experience a significant depressive symptom burden, but do not meet criteria for a depressive episode. Finally, another explanation is that high negative affect may reflect personality characteristics, either reflecting in-born temperament or brain injury associated personality change. Individuals with certain personality characteristics are at high risk for developing depression (Harkness, Bagby, Joffe, & Levitt, 2002). Hence, negative affect, if reflecting certain personality characteristics, would be expected to be more common for those participants with a history of or with a current depressive disorder.

Finally, participants with no depression reported less disability than either those with a history of a depressive episode or a current depressive episode. It has been established that depression is associated with greater disability after TBI (Hibbard et al., 2004), but this study extends these findings to suggest that even those with a history of depressive episode continue to report higher levels of disability than those with no history of depressive episode. Our findings support previous research reporting that poor emotional outcomes after TBI negatively influence participation and satisfaction as individuals attempt to integrate into the community (Anson & Ponsford, 2006; Felmingham, Baguley, & Crooks, 2001; Hoofien, Gilboa, Vakil, & Donovan, 2001; Jorge et al., 1993; Jorge et al., 1993; Morton & Wehman, 1995; Ownsworth & Fleming, 2005; Ruff et al., 1993). Further exploration of the influence of affect on disability, participation, and satisfaction may better inform targets for intervention to improve these outcomes after TBI.

Limitations

The most significant limitation is that this was a secondary analysis of cross-sectional data, and thus, this study was not originally powered for the variables explored in these analyses. Furthermore, the direction of the relationship between depression status and affective state could not be assessed. These findings do, however, highlight the need to explore this relationship further. Our sample was predominantly composed of Caucasian males with minimal communication deficits, and thus we urge caution before generalizing these findings to the broader TBI population. While we used assessments shown to be valid and reliable in the TBI population, more specific measures are necessary to further clarify how affective state represents a distinct construct in general and in relationship to the TBI population in particular. Using assessments more sensitive to gradations in depressive symptoms (e.g., the PHQ-9) may also clarify further the relationship between depression and long-term outcomes after TBI (Bombardier et al., 2010; Fann et al., 2005). Furthermore, individuals with TBI vary in their ability to provide an accurate self-report due to poor cognition or impairment in self-awareness. Developing more objective measures of affective state (e.g., biological indicators) would be helpful for accurately identifying individuals in need of intervention. Furthermore, there is some evidence to suggest that the relationship between affect and mood disorders may be explained by changes in neurotransmitters (Nutt et al., 2007). Given the potential importance of neurotransmitters, information regarding depression treatment (e.g., use of antidepressants) may be important to explore in future studies.

Summary

The persistence of high negative affect after the resolution of a depressive episode and the association of both current and prior depressive episodes with increased disability strongly suggest the need for clinicians to assess and treat affective state in addition to screening for both depressive and anxiety disorders among individuals with chronic TBI.

Without such detailed assessment, the persistence of high negative affect even after resolution of a depressive episode may go unnoticed and continue to influence long-term community integration, health, and quality of life outcomes. Identifying and addressing affective state in the early stages after TBI may contribute to the prevention of more significant clinical depression or other psychiatric syndromes, thus contributing to the improvement of long-term health and community integration outcomes. Future research is required to more clearly specify the relationship amongst affective state, depressive diagnosis, and disability and to explore interventions to address poor affective state in the presence or absence of mood disorders.

Acknowledgments

This study was supported in part through funding received from the School of Health and Rehabilitation Science Research Development Fund, School and Health of Rehabilitation Science, University of Pittsburgh, by the NIH NCMRR/NINDS K12 HD 055931, and by the U.S. Army Medical Research and Materiel Command under Award No. W81XWH-10-1-0920. Opinions, interpretations, conclusions, and recommendations are those of the author and are not necessarily endorsed by the U.S. Army.

Bibliography

- Anson K, Ponsford J. Coping and emotional adjustment following traumatic brain injury. *Journal of Head Trauma Rehabilitation*. 2006; 21:248–259. 00001199-200605000-00005 [pii]. [PubMed: 16717502]
- Anstey KJ, Butterworth P, Jorm AF, Christensen H, Rodgers B, Windsor TD. A population survey found an association between self-reports of traumatic brain injury and increased psychiatric symptoms. *Journal of clinical epidemiology*. 2004; 57:1202–1209. [PubMed: 15567638]
- Beekman AT, Deeg DJ, Braam AW, Smit JH, Van Tilburg W. Consequences of major and minor depression in later life: a study of disability, well-being and service utilization. *Psychological Medicine*. 1997; 27:1397–1409. [PubMed: 9403911]
- Beekman AT, Geerlings SW, Deeg DJ, Smit JH, Schoevers RS, de Beurs E, et al. The natural history of late-life depression: a 6-year prospective study in the community. *Archives General Psychiatry*. 2002; 59:605–611.
- Bombardier CH, Fann JR, Temkin NR, Esselman PC, Barber J, Dikmen SS. Rates of major depressive disorder and clinical outcomes following traumatic brain injury. *JAMA*. 2010; 303:1938–1945. 10.1001/jama.2010.599 [PubMed: 20483970]
- Bowen A, Neumann V, Conner M, Tennant A, Chamberlain MA. Mood disorders following traumatic brain injury: identifying the extent of the problem and the people at risk. *Brain Injury*. 1998; 12:177–190. [PubMed: 9547948]
- Clark LA, Watson D. Tripartite model of anxiety and depression: psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*. 1991; 100:316–336. [PubMed: 1918611]
- Crawford JR, Henry JD. The positive and negative affect schedule (PANAS): construct validity, measurement properties and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*. 2004; 43:245–265. 10.1348/0144665031752934 [PubMed: 15333231]
- Dikmen SS, Bombardier CH, Machamer JE, Fann JR, Temkin NR. Natural history of depression in traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*. 2004; 85:1457–1464. [PubMed: 15375816]

- Fann JR, Bombardier CH, Dikmen S, Esselman P, Warms CA, Pelzer E, et al. Validity of the Patient Health Questionnaire-9 in assessing depression following traumatic brain injury. *The Journal of head trauma rehabilitation*. 2005; 20:501–511. [PubMed: 16304487]
- Felmingham KL, Baguley IJ, Crooks J. A comparison of acute and postdischarge predictors of employment 2 years after traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*. 2001; 82:435–439. S0003-9993(01)25170-3 [pii]. 10.1053/apmr.2001.21985 [PubMed: 11295001]
- Gordon WA, Zafonte R, Cicerone K, Cantor J, Brown M, Lombard L, et al. Traumatic brain injury rehabilitation: state of the science. *American Journal of Physical Medicine and Rehabilitation*. 2006; 85:343–382.10.1097/01.phm.0000202106.01654.61 [PubMed: 16554685]
- Gray E, Watson D. Emotion, mood, and temperament: Similarities, differences, and a synthesis. *Emotions at work: theory, research and applications for management*. 2001:21–44.
- Harkness KL, Bagby RM, Joffe RT, Levitt A. Major depression, chronic minor depression, and the five-factor model of personality. *European Journal of Personality*. 2002; 16:271–281.10.1002/per.441
- Harrison-Felix C, Newton CN, Hall KM, Kreutzer JS. Descriptive findings from the traumatic brain injury model systems national data base. *Journal of Head Trauma Rehabilitation*. 1996; 11(5):1–14.
- Hart T, Brenner L, Clark AN, Bogner JA, Novack TA, Chervoneva I, et al. Major and minor depression after traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*. 2011; 92:1211–1219.10.1016/j.apmr.2011.03.005 [PubMed: 21807140]
- Hart T, Hoffman JM, Pretz C, Kennedy R, Clark AN, Brenner LA. A longitudinal study of major and minor depression following traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*. 2012; 93:1343–1349.10.1016/j.apmr.2012.03.036 [PubMed: 22840833]
- Hibbard MR, Ashman TA, Spielman LA, Chun D, Charatz HJ, Melvin S. Relationship between depression and psychosocial functioning after traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*. 2004; 85:S43–53. [PubMed: 15083421]
- Hoofien D, Gilboa A, Vakil E, Donovan PJ. Traumatic brain injury (TBI) 10–20 years later: a comprehensive outcome study of psychiatric symptomatology, cognitive abilities and psychosocial functioning. *Brain Injury*. 2001; 15:189–209.10.1080/026990501300005659 [PubMed: 11260769]
- Jorge RE, Robinson RG, Arndt SV, Forrester AW, Geisler F, Starkstein SE. Comparison between acute- and delayed-onset depression following traumatic brain injury. *Journal of Neuropsychiatry and Clinical Neuroscience*. 1993; 5:43–49.
- Jorge RE, Robinson RG, Arndt SV, Starkstein SE, Forrester AW, Geisler F. Depression following traumatic brain injury: a 1 year longitudinal study. *Journal of Affective Disorders*. 1993; 27:233–243. [PubMed: 8509524]
- Jorge RE, Robinson RG, Starkstein SE, Arndt SV. Influence of major depression on 1-year outcome in patients with traumatic brain injury. *Journal of Neurosurgery*. 1994; 81:726–733.10.3171/jns.1994.81.5.0726 [PubMed: 7931619]
- Lyness JM, King DA, Cox C, Yoediono Z, Caine ED. The importance of subsyndromal depression in older primary care patients: prevalence and associated functional disability. *Journal of the American Geriatric Society*. 1999; 47:647–652.
- Malec, J. The Mayo-Portland Adaptability Inventory. The Center for Outcome Measurement in Brain Injury. 2005. Retrieved February 15, 2011, from <http://www.tbims.org/combi/mpai>
- Morton MV, Wehman P. Psychosocial and emotional sequelae of individuals with traumatic brain injury: a literature review and recommendations. *Brain Injury*. 1995; 9:81–92. [PubMed: 7874099]
- Nutt D, Demyttenaere K, Janka Z, Aarre T, Bourin M, Canoico PL, et al. The other face of depression, reduced positive affect: the role of catecholamines in causation and cure. *Journal of Psychopharmacology*. 2007; 21:461–71.
- Owensworth T, Fleming J. The relative importance of metacognitive skills, emotional status, and executive function in psychosocial adjustment following acquired brain injury. *Journal of Head Trauma Rehabilitation*. 2005; 20:315–332. 00001199-200507000-00004 [pii]. [PubMed: 16030439]

- Owensworth TL, Oei TP. Depression after traumatic brain injury: conceptualization and treatment considerations. *Brain Injury*. 1998; 12:735–751. [PubMed: 9755365]
- Ruff RM, Marshall LF, Crouch J, Klauber MR, Levin HS, Barth J, et al. Predictors of outcome following severe head trauma: follow-up data from the Traumatic Coma Data Bank. *Brain Injury*. 1993; 7:101–111. [PubMed: 8453409]
- Spitzer RL, Williams JB, Kroenke K, Linzer M, deGruy FV 3rd, Hahn SR, et al. Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *JAMA*. 1994; 272:1749–1756. [PubMed: 7966923]
- Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale. *Lancet*. 1974; 2:81–84. [PubMed: 4136544]
- Watson D, Clark LA, Carey G. Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology*. 1988; 97:346–353. [PubMed: 3192830]
- Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*. 1988; 54:1063–1070. [PubMed: 3397865]

Impact

- While the relationship between depressive disorders and poor affect has been established, little is known about poor affect in the absence of depressive disorders for individuals with chronic TBI. This study explored poor affect in a sample of community-dwelling individuals with chronic TBI, both in the presence and absence of depressive disorders.
- This study confirms the relationship between depression and poor affect after TBI, extending these findings to a sample of individuals with a broader range of time since injury than previous studies. More importantly, this study highlights the existence of poor affect after TBI, even in the absence of depressive disorders. This poor affect may not be detected by standard depression screening tools and may therefore remain unrecognized by rehabilitation professionals.
- Identifying the affective state of individuals with chronic TBI may provide a more thorough understanding of factors influencing long-term outcomes than identifying depressive disorders alone. Furthermore, addressing poor affective state in the early stages after TBI may contribute to the prevention of clinical syndromes, such as depression, and to the improvement of long-term health and community integration outcomes.

Table 1

Depression Status Group Differences

Factor	All n=64		No Depression n=21		History of Depressive Episode Only n=29		Current Depressive Episode n=14		F	p	Post Hoc*
	Mean (±SD)		Mean (±SD)		Mean (±SD)		Mean (±SD)				
Age (years)	46.14 (±16.56)		48.52 (±20.86)		46.59 (±14.42)		41.64 (±13.45)		0.74	.482	
Time Since Injury (months)	50 (13–104) [†]		28 (13–81) [†]		69 (21–179) [†]		23 (13–68) [†]		1.64	.203	
Education (years)	14.67 (±2.63)		15.29 (±2.86)		14.31 (±2.34)		14.50 (±2.82)		0.88	.422	
Disability [‡]	44.27 (±13.01)		35.70 (±13.83)		46.83 (±12.36)		51.21 (±4.87)		8.51	.001	No<Hx, Dep
Positive Affect	32.67 (±7.77)		35.67 (±9.08)		32.93 (±4.81)		27.64 (±8.59)		5.10	.009	No>Dep
Negative Affect [‡]	18.80 (±6.77)		14.52 (±5.07)		20.21 (±6.71)		22.29 (±6.21)		8.19	.001	No<Hx, Dep
	n (%)		n (%)		n (%)		n (%)		χ ²	p	
Gender (male)	51 (80%)		20 (95%)		20 (69%)		11 (79%)		5.21	.074	
Race (white)	62 (97%)		21(100%)		29(100%)		12 (86%)		7.38	.025	No, Hx>Dep
Injury Severity [§]											
Complicated Mild	20 (32%)		8 (38%)		9 (31%)		3 (21%)		6.07	.194	
Moderate	13 (20%)		7 (33%)		4 (14%)		2 (14%)				
Severe	31 (48%)		6 (29%)		16 (55%)		9 (48%)				

Note.

[†]Median (25th–75th percentiles)

[‡]Higher scores indicate poorer outcomes

[§]Based on Glasgow Coma Scale score at time of injury (13–15=complicated mild; 9–12=moderate; 8=severe)

* Means were significantly different at the *p* .05 level based on Bonferroni post hoc paired comparisons. No=No Depression, Hx=History of Depressive Episode Only, Dep=Current Depressive Episode.