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Depressive Symptoms Predict Delayed Ambulation After Traumatic Injury

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ABSTRACT

Background: Impaired psychological state, such as anxiety and depressive symptoms, occurs in up to 40% of patients hospitalized for traumatic injury. These symptoms, in the acute period, may delay engagement in activity, such as ambulation, following injury. The purpose of this study was to determine whether baseline anxiety and depressive symptoms predicted delayed (>48 hr from admission) ambulation in patients hospitalized for major traumatic injury.

Methods: Adults (n = 19) admitted for major trauma (Injury Severity Score [ISS] = 15) provided a baseline measure of anxiety and depressive symptoms (Hospital Anxiety and Depression Scale [HADS]). Logistic regression was used to determine the predictive power of baseline HADS Anxiety and HADS Depression subscale scores for delayed ambulation while controlling for ISS.

Results: At baseline, anxiety was present in 32% of patients; 21% reported depressive symptoms. Baseline HADS Anxiety score did not predict the ambulation group. However, for each 1 point increase in baseline HADS Depression score, the likelihood of patients ambulating after 48 hr from admission increased by 67% (odds ratio = 1.67; 95% CI [1.02, 2.72]; p = .041).

Conclusion: Worsening depressive symptoms were associated with delayed ambulation in the acute period following injury. Future, larger scale investigations are needed to further elucidate the relationship between psychological symptoms and the acute recovery period from trauma to better inform clinicians and guide development of interventions to improve patient outcomes.

Key Words

Ambulation, Anxiety, Depressive symptoms, Traumatic injury

More than 200,000 deaths occur in the United States from traumatic injury annually, equivalent to one death every 3 min (Centers for Disease Control and Prevention, 2016). Advances in management of injured patients over the past decade have reduced trauma-related mortality, while the incidence of trauma has continued to increase (American College of Surgeons, 2011, 2016; Centers for Disease Control and Prevention, 2016). As a consequence, the number of people living with trauma-related disabilities has also increased (O'Donnell et al., 2013), exceeding 12 million people worldwide. Thus, traumatic injuries are associated with long-term consequences for injured individuals, their families, and society (O'Donnell et al., 2013; World Health Organization, 2011, 2013).

Investigators have identified additional long-term consequences of traumatic injury that include anxiety, depressive symptoms, and posttraumatic stress disorder (PTSD), which occur in up to 40% of patients after traumatic injury (Peris et al., 2011; Richmond et al., 2011; Ringdal, Plos, Lundberg, Johansson, & Bergbom, 2009). These psychological states may persist for weeks to years after injury and are associated with impaired functional health and difficulty returning to normal activity (Peris et al., 2011; Richmond et al., 2011, 2014). For example, patients with depression report significantly worse quality of life at 3, 6, and 12 months following injury compared with patients without depression (Richmond et al., 2014).

Although there is evidence that psychological symptoms after trauma are associated with long-term functional consequences, there is limited knowledge of how psychological symptoms in the acute period following injury alter early physical activity and rehabilitation (Peris et al., 2011; Warren, Stucky, & Sherman, 2014; Zatzick, Russo, & Katon, 2003). Early physical activity after hospitalization for critical illness has been associated with

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The authors declare no conflicts of interest.

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improved patient outcomes that included up to a 3-day decreased length of stay in the intensive care unit, a 3-day reduction in hospital length of stay, and a 30% increase in functional status at discharge (Engel, Needham, Morris, & Gropper, 2013; Fraser, Spiva, Forman, & Hallen, 2015; Tucker & Carr, 2016). Fear, anxiety, depressive symptoms, PTSD symptoms, and lack of motivation can be psychological barriers to early ambulation (Rosenbaum et al., 2016; Vranceanu et al., 2014). A systematic exploration of the complex interaction of anxiety and depressive symptoms with physical activity in patients after trauma could provide insight into development of interventions to reduce psychological symptoms to promote early activity and decrease disability and optimize outcomes. Thus, the purpose of this study was to determine the association of baseline anxiety and depressive symptoms with time to first ambulation during hospitalization in patients after major trauma (Injury Severity Score [ISS] >15). We hypothesized that those with higher anxiety or depressive symptoms at baseline would have a greater likelihood of delayed ambulation (>48 hr from admission) regardless of injury severity.

METHODS

Sample and Setting

This was an exploratory, observational study conducted at a large, academic, Level I trauma center in the south-central United States. Patients admitted between April and August 2018 with a diagnosis of traumatic injury were screened for the following eligibility criteria: (1) a primary diagnosis of traumatic injury with an ISS of more than 15 indicating severe injury; (2) age 18 years or older; and (3) able to read and write in English. Potential participants were excluded if they (1) had injuries that prohibited mobility, that is, unstable pelvic or spine fractures, spinal cord injury resulting in quadriplegia or paraplegia, or traumatic brain injury with inability to follow commands or communicate; (2) were determined to have terminal status; (3) had a preexisting disease at baseline that impaired mobility (i.e., neuromuscular diseases); and (5) had a preexisting diagnosis of anxiety, depression, schizoaffective disorder, or bipolar disorder. Those eligible for participation were invited to participate, and those who agreed were enrolled after giving signed informed consent.

A total of 19 participants were enrolled into the study. Figure 1 presents a flow diagram of recruitment, enrollment, and study procedures. Participants were grouped on the basis of time in hours to first documented ambulation (early: ≤48 hr from admission; delayed: >48 hr from admission). This cut point was chosen because 48 hr was the upper limit of the target range for first ambulation per the early mobility protocol on the trauma unit at the study institution.

Measures

Sociodemographic and Clinical Variables

Sociodemographic and clinical variables obtained from the electronic medical record and patient interview included age, gender, race, type of trauma (blunt, penetrating), admission toxicology results, hospital length of stay, time to ambulation, and discharge disposition.

Injury Severity Score

The ISS is a measure of severity of injury that is significantly associated with morbidity and mortality (Baker, O'Neill, Haddon, & Long, 1974). This measure allows the degree of traumatic injury to be categorized into one of six categories ranging from minor to untreatable based on the Abbreviated Injury Scale ([AIS]; Baker et al., 1974). Prior investigators have demonstrated good reliability in determining precise injury severity scoring using the ISS grading (intraclass correlation coefficient [ICC]: .975; Baker et al., 1974; Maduz et al., 2017). The ISS was calculated from raw AIS subscores as outlined by the Association for the Advancement of Automotive Medicine manual (Association for the Advancement of Automotive Medicine, 2016). Individual AIS scores for corresponding injuries were determined by review of documentation in the electronic medical record attested by the attending trauma surgeon.

Anxiety and Depressive Symptoms

Symptoms of anxiety and depressive symptoms were measured using the Hospital Anxiety and Depression Scale ([HADS]; Zigmond & Snaith, 1983). The HADS is a 14-item self-report measure with two subscales; seven items measure anxiety symptoms, and seven items measure depressive symptoms. Each item is rated on a 4-point scale from 0 to 3, with 0 indicating did not experience symptom and 3 indicating high frequency or severity of symptoms over the past week. The subscales are used as independent measures of anxiety and depressive symptoms. Total score for each subscale ranges from 0 to 21, with higher scores indicating more severe symptoms (Zigmond & Snaith, 1983). Established cut points for each subscale have been determined and include no symptoms (0–7), mild (8–10), moderate (11–14), or severe (15–21) (Whelan-Goodinson, Ponsford, & Schonberger, 2009; Zigmond & Snaith, 1983). The HADS has demonstrated reliability in patients after trauma (HADS Anxiety subscale Cronbach α = .92, HADS Depression subscale Cronbach α = .88) and validity (HADS Anxiety subscale: sensitivity = 0.75, specificity = 0.69; HADS Depression subscale: sensitivity = 0.62, specificity = 0.92) when compared with the *DSM-IV* criteria for the clinical diagnoses of anxiety and depression (Whelan-Goodinson et al., 2009).

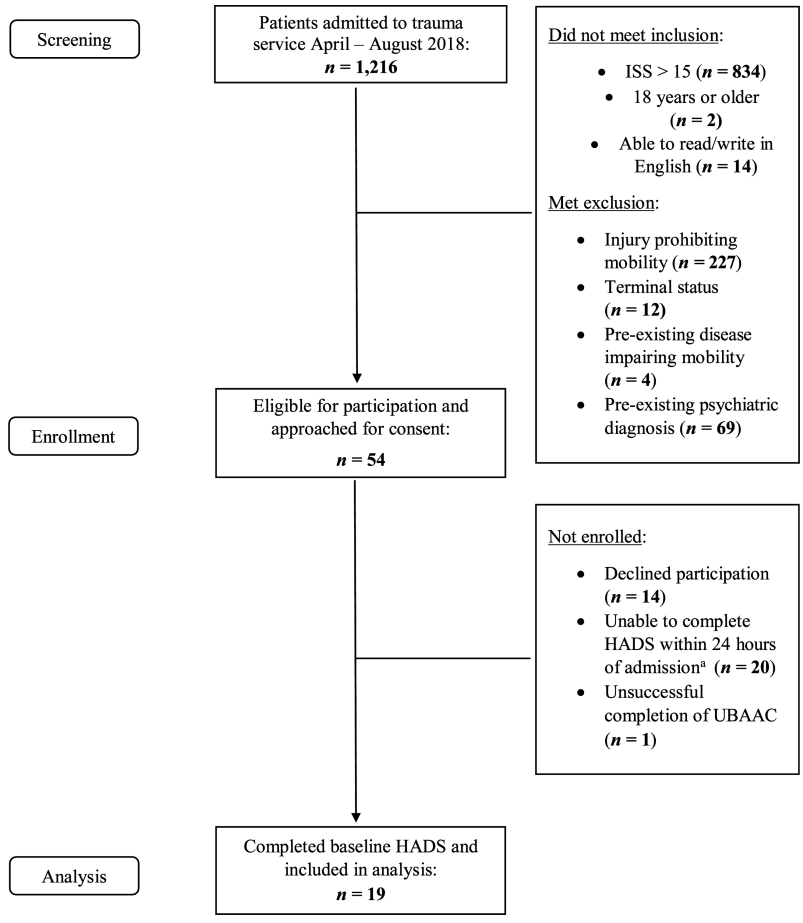

Figure 1. Study flow diagram. ISS = Injury Severity Score; HADS = Hospital Anxiety and Depression Scale; UBACC = University of California, San Diego Brief Assessment of Capacity to Consent. [a]Reasons eligible participants were unable to complete the HADS within 24 hr included mechanical ventilation, altered level of consciousness, participant unavailable (e.g., out of room, procedural restrictions, sleeping).

Procedure

After institutional review board approval, the primary investigator (PI) evaluated all daily admissions to the trauma service. Eligible and willing patients completed the University of California, San Diego Brief Assessment of Capacity to Consent instrument to evaluate their capacity to consent (Jeste et al., 2007). After consent, sociodemographic and baseline clinical data were obtained from the medical record and participant interview within 24 hr of admission. During the interview, participants verbally completed the HADS by the PI reading questions and answer options and marking the participant response. Responses were repeated back to the participant to ensure accuracy. The PI reviewed participants' electronic medical records daily until discharge to determine time to ambulation and length of stay.

Data Analysis

Descriptive statistics including means (standard deviations) and frequencies (percent) were used to characterize the sample. Logistic regression was used to determine whether baseline anxiety and depressive symptom scores predicted participants having delayed ambulation (>48 hr from admission) while controlling for ISS. Because of the small sample size and high correlation between the subscales (Pearson $r = .80$), separate logistic regression models were run for baseline HADS Anxiety and Depression subscale scores. All analyses were conducted using IBM SPSS Statistics (Version 25) with an a priori α level of .05 to indicate significance.

RESULTS

Participant Characteristics

Participants were primarily Caucasian, male, with a mean age of 40 ± 17 years (Table 1). Most injuries were the result of blunt trauma, and the average ISS was 21 ± 4 indicating severe injury. More than half of participants had a positive toxicology screen at admission. Hospital length of stay was 5.6 ± 3.2 days, and nearly half took longer than 48 hr to

TABLE 1 Participant Characteristics

Characteristic	Mean ± *SD*	*n* (%)
Age (years)	40 ± 17	
Gender (male)		12 (63)
Race		
Caucasian		13 (68)
African American		6 (32)
Toxicology screen (positive)		10 (53)
Blunt trauma		16 (84)
ISS	21 ± 4	
Delayed (>48 hr from admission) ambulation		9 (47)
Hospital LOS (days)	5.6 ± 3.2	
ICU LOS (days)	1.4 ± 2.1	
Baseline HADS Anxiety score	6 ± 5	
Baseline HADS Depression score	4 ± 3	
Anxiety (Anxiety score ≥8)		6 (32)
Depression (Depression score >8)		4 (21)
Discharge disposition		
Home		14 (74)
Other inpatient facility		5 (26)

Note. HADS = Hospital Anxiety and Depression Scale; ICU = intensive care unit; ISS = Injury Severity Score; LOS = length of stay.

achieve first ambulation following admission. A third of the sample had anxiety symptoms (HADS Anxiety score ≥8), and 21% reported depressive symptoms (HADS Depression score ≥8). All participants survived their hospitalization, and nearly two thirds were discharged home.

Anxiety and Depression Scores as Predictors of the Ambulation Group

Baseline HADS Anxiety subscale scores did not predict delayed ambulation (Table 2). In contrast, baseline HADS Depression subscale scores predicted being in the delayed ambulation group. For each 1-unit increase in baseline HADS Depression subscale score, participants were 67% more likely to ambulate after 48 hr following admission (odds ratio = 1.67; 95% CI [1.02, 2.72]; $p = .041$).

DISCUSSION

We evaluated the relationship between baseline anxiety and depressive symptoms and delayed ambulation in adult patients hospitalized for major trauma. Our hypothesis that anxiety would predict delayed ambulation was not supported. In contrast, our hypothesis regarding depressive symptoms predicting delayed ambulation was supported. These findings suggest that the presence of depressive symptoms at admission increased the likelihood of delayed ambulation after hospitalization for traumatic injury.

Previous investigators reported anxiety and depressive symptoms in as many as 40% of patients after trauma, but those symptoms were most often measured months after the injury and hospitalization (Peris et al., 2011; Richmond et al., 2011; Ringdal et al., 2009). Investigators who measured anxiety and depressive symptoms during hospitalization for injury found that 17%–45% of patients reported anxiety whereas 17%–60% of patients reported depressive symptoms (Johnson, Lodge, Vollans, & Harwood, 2019; Mason et al., 2009; O'Donnell et al., 2013). At baseline evaluation, O'Donnell et al. (2013) found that traumatically injured patients reported similar levels of anxiety and depressive symptoms as our participants, whereas Johnson et al. (2019) found that 60% of trauma patients had psychological symptoms at hospital discharge. Combined, these results suggest that psychological symptoms are present in many patients early in the acute phase following injury. Whether symptoms present early in the acute phase persist after hospitalization has not been examined. Future longitudinal studies will provide an understanding of how the presence of psychological symptoms early after admission can influence the course of long-term psychological and physical recovery from trauma.

Although anxiety symptoms were more prevalent than depressive symptoms in our participants, they were not predicative of delayed ambulation. Previous investigators demonstrated that anxiety and fear avoidance were associated with delayed return to activity after injury. For example, previous investigators examined the relationship between anxiety and fear with delayed activity after sports-related injury and also found that increasing anxiety and fear delayed reengagement in activity (Fischerauer et al., 2018; Kosy et al., 2019). In addition, Oude Voshaar et al. (2006) reported that fear of falling delayed mobility by 11% in patients after hip fracture, which suggested that psychological state did influence activity. Although anxiety and fear may be used interchangeably, the two phenomena are distinct. Anxiety is a future-oriented anticipatory reaction that can result in avoidance of activity, whereas fear is a reaction to a specific and identifiable threat (Cannon, 1915; Leal, Goes, da Silva, & Teixeira-Silva, 2017; Vincent, Horodyski, Vincent, Brisbane, & Sadasivan, 2015). Use of the HADS did not allow for us to capture fear or differentiate between anxiety and fear. In addition, the insignificant association of anxiety with delayed ambulation in our study may have been due to small sample size, which limited the ability to determine

TABLE 2 Predictors of the Delayed Ambulation Group (>48 hr From Admission)

	B	Exp β	95% CI	*p*
Model 1				
Injury Severity Score	−0.44	.65	[0.38, 1.09]	.10
HADS Anxiety subscale score	0.61	1.84	[0.99, 3.42]	.055
Model 2				
Injury Severity Score	−0.20	.82	[0.61, 1.11]	.19
HADS Depression subscale score	0.51	1.67	[1.02, 2.72]	.041

Note. HADS = Hospital Anxiety and Depression Scale. Model 1: Omnibus Test of Model Coefficients: p = .01; Hosmer–Lemeshow test: p = .270; Model 2: Omnibus Test of Model Coefficients: p = .03; Hosmer–Lemeshow test: p = .322.

predictive ability. Future studies with a larger sample size and use of instrumentation that allowed for anxiety and fear to be captured separately might allow for a better understanding of the association of anxiety with ambulation in patients after trauma, controlling for covariates such as age, pain, substance abuse, and comorbid conditions that could also influence ambulation.

Baseline HADS Depression subscale score predicted delayed ambulation, which supported our hypothesis. This finding is congruent with prior investigators, who found that depressive symptoms were associated with decreased levels of physical activity after injury (Atay, Aslan, Burc, Demirci, & Atay, 2016; Kempen, Sanderman, Scaf-Klomp, & Ormel, 2003; Rosenbaum et al., 2016). Rosenbaum et al. (2016) found that symptoms of depression were associated with less time spent walking during hospitalization after trauma. Atay et al. (2016) also found that persons with depressive symptoms were 40% less active at 6 weeks and 36% less active at 6 months following hip replacement surgery; these findings might suggest that depressive symptoms could be more severe closer to the time of injury, thus impairing activity early in the course of recovery. Kempen et al. (2003) reported that persistent depressive symptoms postinjury continued to reduce activity at 8 weeks, 5 months, and 1 year following discharge. As Atay et al. (2016) and Kempen et al. (2003) examined older adults (mean age 70–79 years) with isolated hip fractures, these investigations were not directly comparable with our population in age or severity of injury. In these prior investigations, participant self-report of activity level was used, rather than an objective measure like that in our investigation, which could have limited the validity of the relationships reported (Atay et al., 2016; Kempen et al., 2003; Rosenbaum et al., 2016). Despite these differences, the findings from our study along with those of previous investigators suggest that there are physical consequences related to engagement in activity from psychological health following traumatic injury. Furthermore, because the HADS captures symptoms reported over the span of the previous 7 days, our findings may indicate that people who experience traumatic injury with unknown, preexisting depressive symptoms could be at risk for impaired return to ambulation during hospitalization. This finding bolsters the importance of assessment of depressive symptoms upon admission.

Limitations

There are limitations that should be considered when interpreting the findings of our study. First, this study was conducted at a single institution with a small sample; thus, our findings are likely not generalizable to all patients after trauma. Because of the small sample size, we were unable to control for potential confounding variables, such as pain and comorbid conditions, which might impact both time to ambulation and psychological symptom (Jeon & Yi, 2018). Despite the inability to statistically control for cofounding variables, our stringent inclusion and exclusion criteria were set in place in an attempt to mitigate the potential influence on time to mobility or psychological symptoms. Second, the method of data collection may have introduced social desirability and response bias because the individual provided oral responses to the PI in the hospital setting. Different responses might have been obtained if the participant completed the instrument in a private setting alone. Finally, we only captured state anxiety, which is influenced by trait characteristics (Leal et al., 2017; Vincent et al., 2015).

Although we excluded participants with preexisting diagnoses of anxiety, depression, schizoaffective disorder, or bipolar disorder, participants could have had an undiagnosed psychiatric condition.

CONCLUSIONS

At baseline, psychological symptoms are prevalent in patients hospitalized for traumatic injury. Depressive symptoms, but not anxiety, predicted later ambulation. It is important to investigate the association between these symptoms and ambulation after injury in a larger sample to

understand the complex interactions that occur between injury and associated psychological symptoms, to clarify how their interactions influence inpatient rehabilitation and ambulation, and to support the development of targeted interventions to provide systematic and evidence-based care for patients after trauma.

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KEY POINTS

- Symptoms of anxiety and depression are prevalent in patients who experience traumatic injury.
- Psychological symptoms may affect how injured patients physically recover.
- A better understanding of the impact psychological symptoms have on physical recover is needed to inform development and testing of interventions to improve outcomes for trauma patients.

REFERENCES

American College of Surgeons. (2011). *National Trauma Data Bank*. Retrieved from https://www.facs.org/quality-programs/trauma/ntdb

American College of Surgeons. (2016). *NTDB Reports and Publications*. Retrieved from https://www.facs.org/quality-programs/trauma/ntdb/docpub

Association for the Advancement of Automotive Medicine. (2016). *Abbreviated Injury Scale: 2015 revision* (6th ed.). Chicago, IL: Author.

Atay, I. M., Aslan, A., Burc, H., Demirci, D., & Atay, T. (2016). Is depression associated with functional recovery after hip fracture in the elderly? *Journal of Orthopaedics*, *13*(2), 115–118. doi:10.1016/j.jor.2015.02.001

Baker, S. P., O'Neill, B., Haddon, W., Jr., & Long, W. B. (1974). The Injury Severity Score: A method for describing patients with multiple injuries and evaluating emergency care. *Journal of Trauma*, *14*(3), 187–196.

Cannon, W. B. (1915). *Bodily changes in pain, hunger, fear and rage: An account of recent researches into the function of emotional excitement*. New York, NY: D Appleton & Co.

Centers for Disease Control and Prevention. (2016). *Wisqars data and statistics*. Retrieved from http://www.cdc.gov/injury/wisqars/overview/key_data.html

Engel, H. J., Needham, D. M., Morris, P. E., & Gropper, M. A. (2013). ICU early mobilization: From recommendation to implementation at three medical centers. *Critical Care Medicine*, *41*(9, Suppl. 1), S69–S80. doi:10.1097/CCM.0b013e3182a240d5

Fischerauer, S. F., Talaei-Khoei, M., Bexkens, R., Ring, D. C., Oh, L. S., & Vranceanu, A. M. (2018). What is the relationship of fear avoidance to physical function and pain intensity in injured athletes? *Clinical Orthopaedics and Related Research*, *476*(4), 754–763. doi:10.1007/s11999.0000000000000085

Fraser, D., Spiva, L., Forman, W., & Hallen, C. (2015). Original research: Implementation of an early mobility program in an ICU. *American Journal of Nursing*, *115*(12), 49–58.

Jeon, S. W., & Yi, E. S. (2018). Factors that influence hospital inpatients' exercise constraints. *Journal of Exercise Rehabilitation*, *14*(4), 606–611. doi:10.12965/jer.1836278.139

Jeste, D. V., Palmer, B. W., Appelbaum, P. S., Golshan, S., Glorioso, D., Dunn, L. B., … Kraemer, H. C. (2007). A new brief instrument for assessing decisional capacity for clinical research. *Archives of General Psychiatry*, *64*(8), 966–974. doi:10.1001/archpsyc.64.8.966

Johnson, L., Lodge, C., Vollans, S., & Harwood, P. J. (2019). Predictors of psychological distress following major trauma. *Injury*, *50*(9), 1577–1583. doi:10.1016/j.injury.2019.05.031

Kempen, G. I. J. M., Sanderman, R., Scaf-Klomp, W., & Ormel, J. (2003). The role of depressive symptoms in recovery from injuries to the extremities in older persons. A prospective study. *International Journal of Geriatric Psychiatry*, *18*(1), 14–22. doi:10.1002/gps.768

Kosy, J. D., Phillips, J. R. P., Edordu, A., Pankhania, R., Schranz, P. J., & Mandalia, V. (2019). Failure to return to preinjury activity level after hamstring anterior cruciate ligament reconstruction: Factors involved and considerations in goal setting. *Indian Journal of Orthopaedics*, *53*(6), 714–720. doi:10.4103/ortho.IJOrtho_186_18

Leal, P. C., Goes, T. C., da Silva, L. C. F., & Teixeira-Silva, F. (2017). Trait vs. State anxiety in different threatening situations. *Trends in Psychiatry and Psychotherapy*, *39*(3), 147–157. doi:10.1590/2237-6089-2016-0044

Maduz, R., Kugelmeier, P., Meili, S., Doring, R., Meier, C., & Wahl, P. (2017). Major influence of interobserver reliability on polytrauma identification with the Injury Severity Score (ISS): Time for a centralised coding in trauma registries? *Injury*, *48*(4), 885–889. doi:10.1016/j.injury.2017.02.015

Mason, S., Farrow, T. F. D., Fawbert, D., Smith, R., Bath, P. A., Hunter, M., … Turpin, G. (2009). The development of a clinically useful tool for predicting the development of psychological disorder following injury. *British Journal of Clinical Psychology*, *48*(Pt. 1), 31–45. doi:10.1348/014466508x344799

O'Donnell, M. L., Varker, T., Holmes, A. C., Ellen, S., Wade, D., Creamer, M., … Forbes, D. (2013). Disability after injury: The cumulative burden of physical and mental health. *Journal of Clinical Psychiatry*, *74*(2), e137–e143. doi:10.4088/JCP.12m08011

Oude Voshaar, R. C., Banerjee, S., Horan, M., Baldwin, R., Pendleton, N., Proctor, R., … Burns, A. (2006). Fear of falling more important than pain and depression for functional recovery after surgery for hip fracture in older people. *Psychological Medicine*, *36*(11), 1635–1645. doi:10.1017/s0033291706008270

Peris, A., Bonizzoli, M., Iozzelli, D., Migliaccio, M. L., Zagli, G., Bacchereti, A., … Belloni, L. (2011). Early intra-intensive care unit psychological intervention promotes recovery from posttraumatic stress disorders, anxiety and depression symptoms in critically ill patients. *Critical Care (London, England)*, *15*(1), R41. doi:10.1186/cc10003

Richmond, T. S., Guo, W., Ackerson, T., Hollander, J., Gracias, V., Robinson, K., & Amsterdam, J. (2014). The effect of postinjury depression on quality of life following minor injury. *Journal of Nursing Scholarship*, *46*(2), 116–124. doi:10.1111/jnu.12064

Richmond, T. S., Ruzek, J., Ackerson, T., Wiebe, D. J., Winston, F., & Kassam-Adams, N. (2011). Predicting the future development of depression or PTSD after injury. *General Hospital Psychiatry*, *33*(4), 327–335. doi:10.1016/j.genhosppsych.2011.05.003

Ringdal, M., Plos, K., Lundberg, D., Johansson, L., & Bergbom, I. (2009). Outcome after injury: Memories, health-related quality of life, anxiety, and symptoms of depression after intensive care. *Journal of Trauma*, *66*(4), 1226–1233. doi:10.1097/TA.0b013e318181b8e3

Rosenbaum, S., Vancampfort, D., Tiedemann, A., Stubbs, B., Steel, Z., Ward, P. B., … Sherrington, C. (2016). Among inpatients, post-traumatic stress disorder symptom severity is negatively associated with time spent walking. *Journal of Nervous and Mental Disease*, *204*(1), 15–19. doi:10.1097/nmd.0000000000000415

Tucker, S. J., & Carr, L. J. (2016). Translating physical activity evidence to hospital settings: A call for culture change. *Clinical Nurse Specialist: The Journal for Advanced Nursing Practice*, *30*(4), 208–215. doi:10.1097/NUR.0000000000000212

Vincent, H. K., Horodyski, M., Vincent, K. R., Brisbane, S. T., & Sadasivan, K. K. (2015). Psychological distress after orthopedic trauma: Prevalence in patients and implications for rehabilitation. *PM R*, *7*(9), 978–989. doi:10.1016/j.pmrj.2015.03.007

Vranceanu, A. M., Bachoura, A., Weening, A., Vrahas, M., Smith, R. M., & Ring, D. (2014). Psychological factors predict disability and pain intensity after skeletal trauma. *Journal of Bone and Joint Surgery. American Volume*, *96*(3), e20. doi:10.2106/jbjs.l.00479

Warren, A. M., Stucky, K., & Sherman, J. J. (2014). Rehabilitation psychology's role in the Level I trauma center. *Journal of Trauma Nursing*, *21*(3), 139–145. doi:10.1097/TA.0b013e3182858ab9

Whelan-Goodinson, R., Ponsford, J., & Schonberger, M. (2009). Validity of the hospital anxiety and depression scale to assess depression and anxiety following traumatic brain injury as compared with the structured clinical interview for DSM-IV. *Journal of Affective Disorders*, *114*(1–3), 94–102. doi:10.1016/j.jad.2008.06.007

World Health Organization. (2011). *World report on disability*. Retrieved from https://www.who.int/disabilities/world_report/2011/report.pdf

World Health Organization. (2013). *Sixty-sixth World Health Assembly (WHA66.9)*. Retrieved from https://apps.who.int/gb/ebwha/pdf_files/WHA66-REC1/WHA66_2013_REC1_complete.pdf

Zatzick, D. F., Russo, J. E., & Katon, W. (2003). Somatic, post-traumatic stress, and depressive symptoms among injured patients treated in trauma surgery. *Psychosomatics*, *44*(6), 479–484. doi:10.1176/appi.psy.44.6.479

Zigmond, A. S., & Snaith, R. P. (1983). The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica*, *67*(6), 361–370.

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