Published in final edited form as:

Int J Inj Contr Saf Promot. 2011 September ; 18(3): 243–248. doi:10.1080/17457300.2011.561927.

Unhealthy and unsafe practices associated with symptoms of depression among injured patients

Sara L. Cooper,

Department of Health & Behavioral Sciences, University of Colorado Denver, College of Liberal Arts & Sciences, Denver, Colorado, USA, 265 Dahlia Street, Denver, CO 80220, USA,
Telephone: 001-720-201-6714; Facsimile: 001-303-388-0696

Allan W. Graham,

Chemical Dependency Treatment Service, Kaiser Permanente Health Plan of Colorado, Denver, Colorado, USA, 10350 E Dakota Ave, Denver, CO 80231, USA, Telephone: 001-303-367-2800; Facsimile: 001-303-367-2828

Cynthia W. Goss, and

Colorado Injury Control Research Center and Colorado School of Public Health, University of Colorado Denver, Aurora, Colorado, USA, 13001 East 17th Place, Campus Box C-245, Aurora, CO 80045, USA, Telephone: 001-303-724-4435; Facsimile: 001-303-724-4489

Carolyn DiGuseppi*

Colorado Injury Control Research Center and Colorado School of Public Health, University of Colorado Denver, Aurora, Colorado, USA, 13001 East 17th Place, Campus Box B-119, Aurora, CO 80045, USA, Telephone: 001-303-724-4415; Facsimile: 001-303-724-4489

Sara L. Cooper: sara@cooperlink.com; Allan W. Graham: Allan.W.Graham@kp.org; Cynthia W. Goss: Cynthia.Goss@ucdenver.edu; Carolyn DiGuseppi: Carolyn.DiGuseppi@ucdenver.edu

1. Introduction

Each year, some 20.9 million US adults suffer from a diagnosable depressive disorder (Kessler, Chiu, Demler & Walters, 2005). Greater numbers have subclinical depressive symptoms, which are associated with increased risk of major depression, physical disability, and medical illness (Kessler, Berglund, Demler, Jin & Walters, 2005; World Health Organization, 2004). Depression, a major contributing factor to deliberate self-harm (McLean, Maxwell, Platt, Harris, & Jepson, 2008), is also associated with increased unintentional injury risk (American Geriatrics Society [AGS], British Geriatrics Society, & American Academy of Orthopaedic Surgeons, 2001, Tiesman et al., 2006). Mood disorders are common in patients presenting for acute injury (Richmond Hollander, Ackerson, Robinson, Gracias, Shults & Amsterdam, 2007).

The potential connection between depressive symptoms and poor health and safety practices, which may further contribute to risk of injury, disability and illness, has not been fully delineated (Cannella & Scoloveno, 2003; Yarcheski, Mahon, Yarcheski, & Cannella,

*Corresponding Author. Carolyn.DiGuseppi@ucdenver.edu.

2004). Many studies investigating this relationship have focused solely on young people (Allgöwer, Wardle, & Steptoe, 2001; Babiss & Gangwisch, 2009; Mahon, Yarcheski, & Yarcheski, 2001; Melnyk et al., 2006; Yarcheski, Mahon, & Yarcheski, 2004), while those investigating adults have been limited by the practices assessed (i.e. physical activity alone) (Farmer, Locke, Moscicki, Dannenberg, Larson & Radloff, 1988) or their restricted study samples (Igna, Julkunen, Vanhanen, Keskivaara, & Verkasalo, 2008; Bonnet, Irving, Terra, Nony, Berthezene & Moulin, 2005; Gazmararian, Baker, Parker, & Blazer, 2000). Only one population-based study has examined a wide variety of health practices among a large sample of adults of all ages (Strine, Mokdad, Dube, Balluz, Gonzalez, Berry & Kroenke, 2008), finding positive associations between current or lifetime depression and smoking, physical inactivity, binge drinking, and heavy drinking.

A similar, negative association between depression and safety behaviours (e.g., seat belt use), which are also important health-promoting practices, has been reported in a few studies of young people (Allgöwer et al., 2001; Mahon et al., 2001; Yarcheski, Mahon, & Yarcheski, 2004) and in one study of adult farm residents (Stallones & Beseler, 2004). However, there is little available evidence on the relationship between safety practices and depressive symptoms in the general adult population.

Further, although studies have found that depressive symptoms are an important risk factor for acute injury (AGS et al., 2001; Cox, Kenardy, & Hendrikz, 2008; Richmond et al., 2007; Richmond et al., 2009; Stoddard & Saxe, 2001; Tiesman et al., 2006), we found no studies examining the association between safety or health practices and depression among trauma patients.

2. Methods

2.1 Study design and data source

We analyzed existing data from a study of acutely injured patients presenting to a minor trauma clinic for initial care of an acute injury (DiGuseppi, Goss, Xu, Magid, & Graham, 2006; Graham, Goss, Xu, Magid, & DiGuseppi, 2007). Subjects were adult members of a metropolitan health maintenance organization (HMO) plan. The Kaiser Foundation Research Institute and Colorado Multiple Institutional Review Boards approved the study.

2.2 Measures

Participants completed a brief lifestyle risk assessment instrument during the clinic visit or by telephone afterward. Details have been described previously (DiGuseppi et al., 2006). Depressive symptoms were identified from positive responses to two questions: “feeling down, depressed, or hopeless” (depressed mood) and taking “little interest or pleasure in doing things” (anhedonia) in the past month. A positive answer to either question is 96% sensitive for identification of depression, but specificity is only 57% (Thibault & Steiner, 2004). To improve specificity, we required a positive answer to both questions to indicate depressive symptoms. A negative response to both questions defined absence of depressive symptoms. Subjects responding ‘yes’ to only one of the two questions were excluded.

Patients were also asked about usual health and safety behaviours in the month before the injury occurred, including frequency of aerobic exercise, amount of high-fibre foods consumed, consistency of sunscreen or sun-protective clothing use, consistency of seatbelt use, and smoking status. Positive practices were defined as active, consistent participation in health-promoting activities (Brown, Muhlenkamp, Fox, & Osborn, 1983; Cannella & Scoloveno, 2003; Yarcheski, Mahon, Yarcheski, et al., 2004). Drinking frequency and problem drinking were measured using the abbreviated Alcohol Use Disorders Identification Test (Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998). Because only 4% of subjects drank alcohol six or more times per week, they were combined with moderate drinkers (2–5 drinks/week) for purposes of analysis.

2.3 Analysis

We modelled the association between individual health practices and symptoms of depression, comparing those with depressive symptoms to those with no symptoms while controlling for gender, age, and method of data collection.

3. Results

We examined 376 injured subjects (84.1% of the total) who gave concordant responses (i.e., both 'yes' or both 'no') to the questions on depressed mood and anhedonia. Most injuries were unintentional, with nearly 60% due to just two causes: falls (30%) and sports and recreation injuries (27%). Only 4% were due to motor vehicle crashes, 0.3% to intentional self-injury and none to violence. Sample characteristics are described in Table 1.

Symptoms of depression were reported by 14.1% of subjects. These subjects were significantly more likely to be female, as expected (Blehar & Oren, 1997; Kessler, Berglund, Demler, Jin, Koretz, Merikangas & Wang, 2003; Weissman, Bland, Canino, Faravelli, Greenwald, Hwu & Yeh, 1996), but did not otherwise differ from those without symptoms (Table 1).

Depressive symptoms were significantly associated with exercising less often, having ever smoked, and smoking currently, even after accounting for gender, study site and data collection method (Table 2). Having quit smoking was significantly associated with depressive symptoms in crude but not adjusted analyses. Depressive symptoms were also positively associated with reduced consumption of high-fibre foods and inconsistent seatbelt use, although these associations were not statistically significant. There was no association with inconsistent sun protection use or problem drinking. Those drinking at least two drinks per week were significantly less likely to report depressive symptoms compared to non-drinkers, while lighter drinkers did not differ from non-drinkers. In adjusted analyses, a persistent protective effect of moderate drinking was of borderline statistical significance.

Seventy-four subjects engaged in (i.e., reported meeting the reference standard for) 4 healthy behaviours, of whom 5 (6.8%) reported symptoms of depression. In contrast, of 153 subjects practicing 2 health promoting behaviours, 21 (13.7%) reported depressive symptoms. Of 35 subjects reporting only one healthy behaviour, 7 (20.0%) reported symptoms.

4. Discussion

Depressive symptoms are both a risk factor for and a consequence of acute injury, even minor ones (AGS et al., 2001; Cox et al., 2008; Richmond et al., 2007, 2009; Stoddard & Saxe, 2001; Tiesman et al., 2006). Our results demonstrate that acutely injured individuals with depressive symptoms are more likely to report unhealthy practices, including physical inactivity and smoking, as has been reported in non-injured adult populations (e.g., Allgöwer et al., 2001; Dunn et al., 2001; Farmer et al., 1988; Gazmararian et al., 2000; Igna et al., 2008; Strine et al., 2008; Wiesbeck, Kuhl, Yaldizli, & Wurst, 2008), and suggest that depressive symptoms may also be associated with an unhealthy diet and inconsistent seat belt use in the injured population.

The association we found between depressive symptoms and physical inactivity among injured patients supports findings in other populations (Canella & Scoloveno, 2003; Yarcheski, Mahon, Yarcheski, et al., 2004; Farmer et al., 1988; Strine et al., 2008; Bonnet et al., 2005). The reciprocal association between acute injury and depression (AGS et al., 2001; Cox et al., 2008; Richmond et al., 2007, 2009; Stoddard & Saxe, 2001; Tiesman et al., 2006) suggests that physical inactivity could mediate or contribute to the association between depressive symptoms and certain injury risks, such as falls in older adults (Park & Park, 2008; Turcu, Toubin, Mourey, D'Athis, Manckoundia & Pfitzenmeyer, 2004), while depressive symptoms that result from acute injury might also be mediated by physical inactivity. Injuries serious enough to warrant a visit to an urgent care clinic or emergency department often result in modified or restricted physical activity post-treatment. Limited activity, whether related solely to the injury or further reduced as a result of associated depression, has the same result: deconditioned musculature, which typically affects gait and balance, two significant risk factors for falls and other injuries related to overexertion or strenuous activity (e.g. sprains, strains, or back injury).

Inconsistent seatbelt use and low consumption of high-fibre foods also appeared to be modestly associated with depressive symptoms. With only 53 subjects reporting depressive symptoms, our power to detect small differences in positive health and safety practices was limited, but the direction and magnitude of their effects were consistent with previous reports in adolescents (Mahon et al., 2001; Yarcheski, Mahon, & Yarcheski, 2004). The similar relationships observed between depressive symptoms and exercise, high-fibre diet, and seatbelt use are consistent with the conceptualization of positive preventive behaviours as a one-dimensional phenomenon, in which individuals behave consistently positively (or negatively) across health practices (Langlie, 1979; Mahon, Yarcheski, & Yarcheski, 2002). Subjects with multiple unhealthy behaviours were more than twice as likely to have symptoms of depression as those with few or no unhealthy behaviours. If health- and safety-promoting behaviours indeed cluster among injured patients, certain of these may act as markers for a continuum of positive health practices which may help prevent or limit injury, and subsequently mitigate depression that results from acute injury.

We used two screening questions to define depressive symptoms, without further clinical validation. The likelihood of major depression among subjects with negative responses on both questions was shown to be only 1% in a general clinic population (Thibault & Steiner,

2004). Hence, the risk of false negatives among those reported as “not depressed” in this study is quite low. However, Thibault & Steiner (2004) found that the probability of depression among those answering ‘Yes’ to *either* question is only 28% (Thibault & Steiner, 2004). Because we were unable to conduct clinical assessment to diagnose depression, we attempted to address possible false positive responses by requiring a positive answer on *both* questions to define the presence of depressive symptoms. Nevertheless, at least some of those reporting positive symptoms may not in fact have depression, potentially reducing differences between groups (Type 2 error). Therefore, those associations that we did identify may have been underestimated, and we may have failed to identify additional true associations.

A substantially lower proportion of the acutely injured subjects in our study reported depression symptoms compared to primary care patients answering the same questions (Thibault & Steiner 2004; Whooley, Avins, Miranda, & Browner, 1997). Selection bias is unlikely to explain this relatively low prevalence, since study participants were similar to all injured adult patients seen in the study trauma clinics during the study period (DiGuseppi et al., 2006). However, it may reflect an HMO population that is generally healthier than the general population. The small number of subjects reporting depressive symptoms limited the power of this study to detect important associations, as noted above. Nevertheless, with 376 subjects, our sample is larger than a number of studies that have evaluated similar relationships (Mahon et al., 2001; Yarcheski, Mahon, & Yarcheski, 2004), and is the only one to address an acutely injured adult population.

The prevalence of consistent seat belt use in our sample was substantially higher than the national self-reported prevalence of 80% during the same time period (Centers for Disease Control and Prevention, 2004). While this might reflect social desirability bias (Choi & Pak, 2005) in self-reported seat belt use (Hunter, Stewart, Stutts, & Rodgman, 1993), national prevalence estimates are also based on self-report. Moreover, suffering an acute injury may influence patients to over-report seat belt use even when their injury did not occur in a motor vehicle crash. Since all study participants had acute injuries, however, any association between injury and over-reporting of seat belt use is unlikely to have biased our results.

5. Implications for Practice and Research

Based on our findings, we recommend that in the minor trauma clinic setting, identification of depressive symptoms in patients should be followed by an assessment of health and safety practices, particularly exercise and smoking, and ongoing promotion of positive health and safety behaviours, to prevent further injury and illness. Encouragement of positive health practices among depressed patients may also have beneficial effects on other health outcomes not considered in this study. Identification of sentinel practices indicative of a broader cluster of unhealthy behaviours may be an important next step in quantifying risk of depression and consequent risk of injury in the general population. Finally, further research in larger samples is needed to evaluate the relationship between depressive symptoms and unsafe practices, particularly among injured patients and in subgroups of the population defined by gender, age, and other characteristics.

Acknowledgments

We thank Michael Emerson, PhD, who developed the initial study implementation plan; Fabio Almeida, Kristen Rahbar, Anna Sukhanova, and Kristi Wishcop, who performed data collection; and Joshua Gordon and Marilyn Pearson, who helped collect data. We gratefully acknowledge the clinical and administrative staff and patients of Kaiser Permanente of Colorado. This study was supported by Grant Number R03/AA013708-01 from the National Institute on Alcohol Abuse and Alcoholism (NIAAA). Dr. DiGiuseppi and Ms. Goss also received support from Grant Number R49-CCR811509 from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIAAA or the CDC.

References

- Allgöwer A, Wardle J, Steptoe A. Depressive symptoms, social support, and personal health behaviors in young men and women. *Health Psychology*. 2001; 20:223–227.10.1037//0278-6133.20.3.223 [PubMed: 11403220]
- American Geriatrics Society, British Geriatrics Society, & American Academy of Orthopaedic Surgeons Panel on Falls Prevention. Guideline for the prevention of falls in older persons. *Journal of the American Geriatrics Society*. 2001; 49:664–672. [PubMed: 11380764]
- Babiss L, Gangwisch J. Sports participation as a protective factor against depression and suicidal ideation in adolescents as mediated by self-esteem and social support. *Journal of Developmental and Behavioral Pediatrics*. 2009; 30:376–384. [PubMed: 19692930]
- Blehar MC, Oren DA. Gender differences in depression. *Medscape Women's Health*. 1997; 2(2):3. [PubMed: 9746677]
- Bonnet F, Irving K, Terra J, Nony P, Berthezene F, Moulin P. Anxiety and depression are associated with unhealthy lifestyle in patients at risk of cardiovascular disease. *Atherosclerosis*. 2005; 178:339–344. [PubMed: 15694943]
- Brown N, Muhlenkamp A, Fox L, Osborn M. The relationship among health beliefs, health values, and health promotion activity. *Western Journal of Nursing Research*. 1983; 5(2):155–163. [PubMed: 6553431]
- Bush K, Kivlahan DR, McDonell MB, Fihn SD, Bradley KA. The AUDIT alcohol consumption questions (AUDIT-C): An effective brief screening test for problem drinking. *Archives of Internal Medicine*. 1998; 158:1789–1795. [PubMed: 9738608]
- Cannella B, Scoloveno M. An integrative review of positive health practices. *Clinical Nursing Research*. 2003; 12:324–339. [PubMed: 14620690]
- Centers for Disease Control and Prevention. Impact of primary laws on adult use of safety belts – United States, 2002. *Mortality and Morbidity Weekly Report*. 2004; 53:257–260.
- Choi, BCK.; Pak, AWP. A catalog of biases in questionnaires. *Preventing Chronic Disease*. 2005. http://www.cdc.gov/pcd/issues/2005/jan/04_0050.htm
- Cox C, Kenardy J, Hendrikz J. A meta-analysis of risk factors that predict psychopathology following accidental trauma. *Journal for Specialists in Pediatric Nursing*. 2008; 13:98–110. [PubMed: 18366377]
- DiGiuseppi C, Goss C, Xu S, Magid D, Graham A. Telephone screening for hazardous drinking among injured patients seen in acute care clinics: Feasibility study. *Alcohol and Alcoholism*. 2006; 41:438–445. [PubMed: 16679344]
- Dunn AL, Trivedi MH, O'Neal HA. Physical activity dose-response effects on outcomes of depression and anxiety. *Medicine & Science in Sports and Exercise*. 2001; 33:S587–S597. [PubMed: 11427783]
- Farmer M, Locke B, Moscicki E, Dannenberg A, Larson D, Radloff L. Physical-activity and depressive symptoms - The NHANES-I epidemiologic follow-up-study. *American Journal of Epidemiology*. 1988; 128:1340–1351. [PubMed: 3264110]
- Gazmararian J, Baker D, Parker R, Blazer DG. A multivariate analysis of factors associated with depression: evaluating the role of health literacy as a potential contributor. *Archives of Internal Medicine*. 2000; 160:3307–3314. [PubMed: 11088094]

- Graham A, Goss C, Xu S, Magid D, DiGuseppi C. Effect of using different modes to administer the AUDIT-C on identification of hazardous drinking and acquiescence to trial participation among injured patients. *Alcohol and Alcoholism*. 2007; 42:423–429.10.1093/alcalc/agl123 [PubMed: 17341515]
- Hunter WW, Stewart JR, Stutts JC, Rodgman EA. Observed and self-reported seat belt wearing as related to prior traffic accidents and convictions. *Accident Analysis and Prevention*. 1993; 25:545–554. [PubMed: 8397657]
- Ignä C, Julkunen J, Vanhanen H, Keskivaara P, Verkasalo M. Depressive symptoms and serum lipid fractions in middle-aged men: Physiologic and health behavior links. *Psychosomatic Medicine*. 2008; 70:960–966. [PubMed: 18981271]
- Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas K, Wang PS. The epidemiology of major depressive disorder - Results from the National Comorbidity Survey Replication (NCS-R). *JAMA-Journal of the American Medical Association*. 2003; 289:3095–3105.10.1001/jama.289.23.3095
- Kessler R, Berglund P, Demler O, Jin R, Walters E. Lifetime prevalence and age-of-onset distributions' of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*. 2005; 62:593–602. [PubMed: 15939837]
- Kessler R, Chiu W, Demler O, Walters E. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*. 2005; 62:617–627. [PubMed: 15939839]
- Langlie J. Interrelationships among preventive health behaviors - Test of competing hypotheses. *Public Health Reports*. 1979; 94:216–225. [PubMed: 451130]
- Mahon N, Yarcheski A, Yarcheski T. Mental health variables and positive health practices in early adolescents. *Psychological Reports*. 2001; 88:1023–1030. [PubMed: 11597048]
- Mahon N, Yarcheski A, Yarcheski T. Psychometric evaluation of the Personal Lifestyle Questionnaire for adolescents. *Research in Nursing & Health*. 2002; 25:68–75. [PubMed: 11807921]
- McLean, J.; Maxwell, M.; Platt, S.; Harris, F.; Jepson, R. Risk and protective factors for suicide and suicidal behaviour: A literature review. Edinburgh: Scottish Government Social Research; 2008. Retrieved October 1, 2010 from <http://www.scotland.gov.uk/Resource/Doc/251539/0073687.pdf>
- Melnik BM, Small L, Morrison-Beedy D, Strasser A, Spath L, Kreipe R, Van Blankenstein S. Mental health correlates of healthy lifestyle attitudes, beliefs, choices and behaviors in overweight adolescents. *Journal of Pediatric Health Care*. 2006; 20:401–406.10.1016/j.pedhc.2006.03.004 [PubMed: 17071371]
- Park H, Park K. The mediating effect of depression in the relationship between muscle strength of extremities and falls among community-dwelling elderly. *Journal of Korean Academy of Nursing*. 2008; 38:730–738.10.4040/jkan.2008.38.5.730 [PubMed: 19114762]
- Richmond TS, Amsterdam JD, Guo W, Ackerson T, Gracias V, Robinson KM, Hollander JE. The effect of post-injury depression on return to pre-injury function: A prospective cohort study. *Psychological Medicine*. 2009; 39:1709–1720.10.1017/S0033291709005376 [PubMed: 19250582]
- Richmond TS, Hollander JE, Ackerson TH, Robinson K, Gracias V, Shults J, Amsterdam J. Psychiatric disorders in patients presenting to the emergency department for minor injury. *Nursing Research*. 2007; 56:275–282.10.1097/01.NNR.0000280616.13566.84 [PubMed: 17625467]
- Stallones L, Beseler C. Safety practices and depression among farm residents. *Annals of Epidemiology*. 2004; 14:571–578.10.1016/j.annepidem.2003.11.004 [PubMed: 15350957]
- Stoddard F, Saxe G. Ten-year research review of physical injuries. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2001; 40:1128–1145. [PubMed: 11589526]
- Strine TW, Mokdad AH, Dube SR, Balluz LS, Gonzalez O, Berry JT, Kroenke K. The association of depression and anxiety with obesity and unhealthy behaviors among community-dwelling US adults. *General Hospital Psychiatry*. 2008; 30:127–137.10.1016/j.genhosppsych.2007.12.008 [PubMed: 18291294]
- Thibault JM, Steiner RWP. Efficient identification of adults with depression and dementia. *American Family Physician*. 2004; 70:1101–1110. [PubMed: 15456119]

- Tiesman H, Peek-Asa C, Whitten P, Sprince N, Stromquist A, Zwerling C. Depressive symptoms as a risk factor for unintentional injury: A cohort study in a rural county. *Injury Prevention*. 2006; 12:172–177.10.1136/ip.2006.011544 [PubMed: 16751447]
- Turcu A, Toubin S, Mourey F, D'Athis P, Manckoundia P, Pfitzenmeyer P. Falls and depression in older people. *Gerontology*. 2004; 50:303–308.10.1159/000079128 [PubMed: 15331859]
- Weissman MM, Bland RC, Canino GJ, Faravelli C, Greenwald S, Hwu H, Yeh E. Cross-national epidemiology of major depression and bipolar disorder. *JAMA-Journal of the American Medical Association*. 1996; 276:293–299.
- Whooley M, Avins A, Miranda J, Browner W. Case-finding instruments for depression - Two questions are as good as many. *Journal of General Internal Medicine*. 1997; 12:439–445. [PubMed: 9229283]
- Wiesbeck GA, Kuhl H-C, Yaldizli Ö, Wurst FM. Tobacco smoking and depression - Results from the WHO/ISBRA study. *Neuropsychobiology*. 2008; 57:26–31.10.1159/000123119 [PubMed: 18424908]
- World Health Organization. The world health report 2004: Changing history. Geneva: World Health Organization; 2004.
- Yarcheski T, Mahon N, Yarcheski A. Depression, optimism, and positive health practices in young adolescents. *Psychological Reports*. 2004; 95:932–934. [PubMed: 15666931]
- Yarcheski A, Mahon N, Yarcheski T, Cannella B. A meta-analysis of predictors of positive health practices. *Journal of Nursing Scholarship*. 2004; 36:102–108. [PubMed: 15227755]

Table 1

Distribution of demographic and study characteristics among 376 patients seen for acute injury, with and without symptoms of depression.

	Depressed		Not Depressed		Crude OR	95% CI	p-value
All Participants	n	%	n	%			
	376	53	323	100%			
Gender	366						0.0354
Male (reference)	15	30.00	145	45.9	--	--	
Female	35	70.00	171	54.1	2.0	1.0, 4.1	
Age Group	369						0.3381
65+ years (reference)	5	9.8%	35	11.0%	--	--	
45-64 years	22	43.1%	104	32.7%	1.5	0.5, 5.4	
35-44 years	12	23.5%	69	21.7%	1.2	0.4, 4.8	
25-34 years	10	19.6%	70	22.0%	1.0	0.3, 4.0	
18-24 years	2	3.9%	40	12.6%	0.3	0.03, 2.3	
Urban vs. Suburban Clinic	376						0.9653
Urban (reference)	21	39.6%	129	39.9%	--	--	
Suburban	32	60.4%	194	60.1%	1.0	0.5, 1.9	
Method of Survey Collection	376						0.8041
Telephone (reference)	13	24.5%	65	20.1%	--	--	
Oral	7	13.2%	57	17.6%	0.6	0.2, 1.8	
Paper	17	32.1%	100	31.0%	0.9	0.4, 2.0	
Electronic	16	30.2%	101	31.3%	0.8	0.3, 1.9	

Values shown in bold indicate statistical significance at $p < 0.05$.

Table 2
Association between positive health practices and depression symptoms among injured patients.

	Depressed			Not Depressed			Crude OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
	n	%	n	%	n	%				
Aerobic Exercise										
3 times /wk (reference)	14	26.4%	160	49.5%			1.0	--	1.0	--
1–2 times /wk	13	24.5%	71	22.0%			2.1 (0.9, 4.7)	0.0722	2.7 (1.1, 6.4)	0.0236
Occasionally or none	17	32.1%	68	21.0%			2.9 (1.3, 6.1)	0.0069	3.3 (1.4, 7.5)	0.0058
None for specific reasons [†]	9	16.9%	24	7.4%			4.3 (1.7, 11.0)	0.0024	5.0 (1.8, 14.1)	0.0021
High-fibre foods (daily servings)										
5 servings (reference)	8	15.1%	63	19.5%			1.0	--	1.0	--
1–4 servings	40	75.5%	228	70.6%			1.4 (0.6, 3.1)	0.4337	1.5 (0.6, 3.5)	0.3568
< 1 serving	5	9.4%	32	9.9%			1.2 (0.4, 4.1)	0.7341	1.7 (0.5, 5.8)	0.4350
Sun Protection Use										
Always (ref)	27	50.9%	129	40.1%			1.0	--	1.0	--
Sometimes	15	28.3%	129	40.1%			0.6 (0.3, 1.1)	0.0887	0.7 (0.3, 1.4)	0.2768
Never	11	20.8%	64	19.9%			0.8 (0.4, 1.8)	0.6125	1.3 (0.6, 3.0)	0.5126
Seatbelt Use										
Always (reference)	47	88.7%	294	91.0%			1.0	--	1.0	--
Sometimes or never	6	11.3%	29	9.0%			1.3 (0.5, 3.3)	0.5865	2.2 (0.8, 6.1)	0.1463
Ever Smoked										
No (reference)	17	32.1%	174	53.9%			1.0	--	1.0	--
Yes	36	67.9%	149	46.1%			2.5 (1.3, 4.6)	0.0033	2.3 (1.2, 4.4)	0.0101
Current Smoking Status										
Never smoked (reference)	17	32.7%	174	54.4%			1.0	--	1.0	--
Quit smoking	20	38.5%	96	30.0%			2.1 (1.1, 4.3)	0.0322	2.0 (0.97, 4.2)	0.0610
Current smoker	15	28.8%	50	15.6%			3.1 (1.4, 6.6)	0.0039	2.8 (1.3, 6.2)	0.0120
Drinking Frequency										
Never (reference)	15	29%	67	20%			1.00	--	1.00	--
1 time per week	32	62%	184	57%			0.8 (0.4, 1.5)	0.462	0.9 (0.4, 1.9)	0.833
2 times per week	5	10%	71	23%			0.3 (0.1, 0.9)	0.033	0.4 (0.1, 1.2)	0.092

	Depressed		Not Depressed		Crude OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
	n	%	n	%				
Drinking Behaviour								
No drinking problem	45	86.5%	247	77.2%	1.0	--	1.0	--
Problem drinking	7	13.5%	73	22.8%	0.5 (0.2, 1.2)	0.1333	0.7 (0.3, 1.7)	0.4671

Values shown in bold indicate statistical significance at p<0.05.

* Each analysis models the individual protective health behaviour while controlling for gender, age group, and method of survey collection.

† None due to physical limitations or because of other physical activity.