

Role of Psychological Resilience on Health-Outcomes in Hospitalized Patients with Acute Illness: A Scoping Review

EM Bradley-Roberts & CP Subbe

Abstract

Recovery from Acute Illness is dependent on severity of illness. We aimed to investigate whether resilience as the 'ability to bounce back' might also affect recovery.

We conducted a scoping review to identify gaps in the existing literature. We used emergency care, intensive care, critical care and trauma as surrogates for acute illness. We mapped synonyms for resilience and selected 'resilience' and 'robustness'. The search was limited to adult patients admitted to hospitals.

We found strong evidence for psychological sequelae of acute illness but no research focusing specifically on the concepts of resilience or robustness and no interventional studies in the acute hospital setting.

The concept of resilience might be applicable to unscheduled admissions to hospital. Measurements and potential interventions require further research.

Keywords

Resilience, Acute Medicine, Critical Care, recovery, post traumatic stress syndrome.

Key learning points

- Resilience is the ability to 'bounce back' after adverse life events.
- Resilience affects chronic health and might affect outcomes after acute illness.
- Resilience can be improved through various psychological treatments.
- It is not known whether strengthening resilience might influence readmission rates or rates of recovery after acute medical illness.

Introduction

Resilience was first recognized as a distinct concept by child psychologists in the 1970's during investigations into why some children were able to overcome hardship whereas others suffered negative psychological outcomes. Investigations into how some people are more 'naturally resistant' to negative psychological outcomes subsequently extended into other areas of psychology, sport science and the military.¹

Resilience is commonly described as the ability to "bounce back" after hardships. Rather than a "solitary characteristic", resilience can be described by a number of attributes including: acceptance, faith, hope, optimism, sense of purpose, meaningful relationships, activity, understanding and a sense of control,² "viewing the adversity as a challenge/opportunity" (problem-focused coping), engaging the support of others, goal-setting, self-efficacy, humour and adaptability to change.³ There is currently no accepted universal definition of resilience.

There is extensive evidence that psychological wellbeing can impact physical recovery, particularly in the context of stress reactions. Negative reactions

to stress are known to impact on immune system and wound healing as well as influence adherence to treatment. It has therefore been inferred that resilience levels may also impact on physical outcomes.⁴⁻⁶

It seems that individuals with higher resilience are able to more efficiently recover back to "normal" after adversity. Resilience has been described as a stable individual character trait or a changeable trajectory to recovery that can be learnt as a coping 'strategy'.^{7,8} The latter concept would allow interventions for individuals with low resilience, arming them with an optimum degree of psychological protection against adverse outcomes.⁹ Measures of resilience have been used to explain variation in control of chronic diseases such as asthma,¹⁰ diabetes¹¹ or epilepsy.¹²

Acute Illness is a major challenge to coping strategies—we aimed to examine the medical literature to understand the influence of resilience on recovery from acute illness and the potential impact of resilience-strengthening techniques in this setting.

Methods

We undertook a scoping review of the available literature. Scoping reviews are a traceable method of

Elen Marged

Bradley-Roberts

MA, School of Medical Sciences, Bangor University

Christian P Subbe

DM, MRCP, Consultant Acute, Respiratory & Critical Care Medicine, Ysbyty Gwynedd, Penrhosgarnedd, Bangor and Senior Clinical Lecturer, School of Medical Sciences, Bangor University

Correspondence

Christian P Subbe
Ysbyty Gwynedd,
Penrhosgarnedd,
LL57 2PW, Bangor, UK
Email: csubbe@hotmail.com

*Role of Psychological Resilience on Health-Outcomes
in Hospitalized Patients with Acute Illness: A Scoping Review*

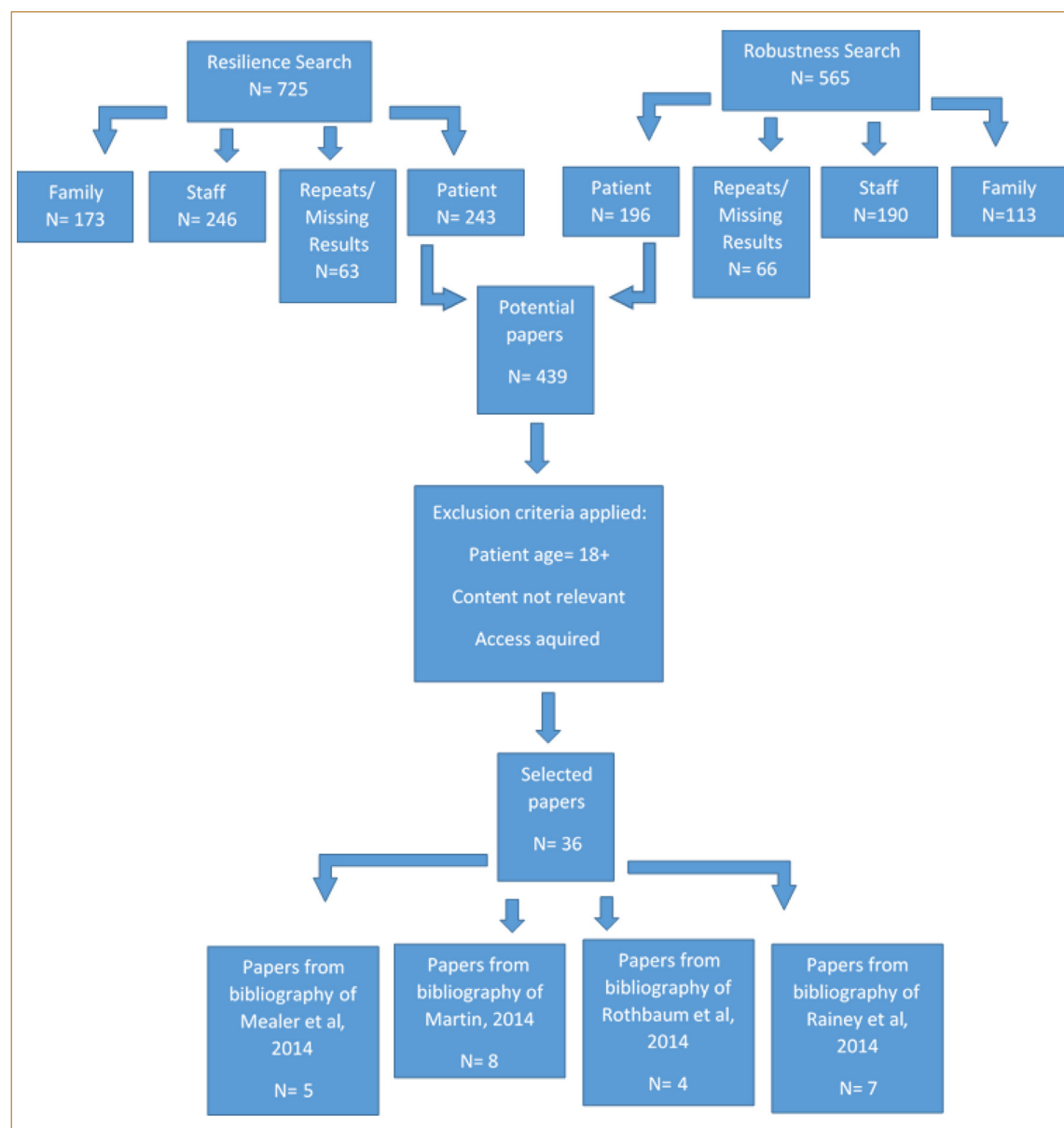


Figure 1. Process of selecting relevant papers from the literature searches

‘mapping’ areas of research and highlight gaps in the literature to lay the ground for future research. We used Arksey and O’Malley’s¹³ five stages framework for undertaking a scoping review:

1. Develop the research questions: [a] What is the role of resilience in understanding the recovery from acute illness requiring hospitalization? [b] Could ‘resilience-based interventions’ investigated in other fields potentially be applied in the type of acute illness seen in Acute Medicine?
2. Identifying relevant studies: We focused on the two most commonly-used terms ‘resilience’ and ‘robustness’. Two librarian-assisted searches were conducted in the Ovid medline database (Figure 1).

3. Selection of studies: We focused exclusively on studies describing interventions in hospitalized patients. Where no studies were available in this area we reviewed studies in patients but not in staff or carers. 1290 abstracts were identified and reviewed. Only patient-centred papers were selected for review: a total of 36 relevant papers were found in the librarian-assisted searches and 24 further papers were found by ‘snowballing’ of references. A further 25 papers were gathered from additional searches.
4. Charting the data: Papers were divided into ‘categories’ based on similarities in their main objectives/findings and the themes discussed.
5. Collating, summarizing and reporting the results

Role of Psychological Resilience on Health-Outcomes in Hospitalized Patients with Acute Illness: A Scoping Review

Results

The psychological impact of acute illness

The traditional ‘outcome’ measure in research of acute illness is mortality, however with falling mortality-rates the long-term effects in survivors have gained importance. Measured outcomes after admissions to hospital include recovery trajectories, psychological changes, changes to health-related quality of life and hospital re-admission rates.¹⁴

Admission for acute illness/injury is considered as a ‘single traumatic event’ in the life of the patient. Numerous studies have investigated the association between this ‘event’ and subsequent psychological morbidity as well as the impact of psychological morbidity on physical recovery.^{4,5,15} The literature supports a significant association between acute admission and development of psychological morbidity¹⁶⁻¹⁸ with a focus on trauma and Intensive Care admissions. Patients admitted to Intensive Care have been found to have high rates of psychological morbidity in follow-ups.^{14,19,20}

The psychological problems associated with acute illness/injury range from anxiety and stress disorders to depression, cognitive problems and delirium.^{14,16,21} It has been inferred that in addition to the ‘event’ of injury/illness, patients are faced with an array of associated stressors including prolonged pain and discomfort, loss of control, uncertainty, confusion, and sleep deprivation.²² For patients admitted to Intensive Care, psychological interventions can lead to decrease in pain ratings, anxiety, rate of complications and length of stay, and improved sleep and patient satisfaction.²³ The development of acute stress disorder (ASD) is common in acute care settings and that ASD may be a risk factor for future long-term stress disorders such as post-traumatic stress disorder (PTSD).^{24,25}

PTSD is described as a stress disorder that develops after a single event whereas resilience, as a long-term trait/strategy may determine the outcome after numerous ‘events’. Resilience is believed to be a function of efficient processing of stress – it could thus be hypothesized that low levels of resilience render patients susceptible to inappropriate stress responses and the associated risks.

Resilience/Coping in acute settings

While there is a scarcity of literature directly concerning the impact of resilience in patients hospitalized with acute illness, the terms ‘coping’ and ‘coping strategies’ were encountered frequently in the search results. It was found that the characteristics of efficient coping echo the characteristics of ‘resilience’ as described by a number of authors. If ‘coping’ is used synonymously with resilience,

then ‘ineffective’ coping strategies may comprise the features of low resilience and effective coping strategies may comprise of ‘high resilience’ features (Table 1).

González-Freire²⁶ assessed the ‘coping styles’ of asthma patients – problem focused coping styles are adaptive and correlated to positive outcomes whereas emotionally focused styles can be maladaptive and correlated with poorer outcomes such as increased emergency department (ED) admissions.

‘Denial’ is described as an unfavourable coping strategy by several authors. Haase²⁷ found that low resilience’ individuals (as measured by resilience scales) displayed decreased awareness of their environment and responsiveness to signals, but higher activity in the brain in reaction to stress. It was also found that the ‘increased neuronal activity’ was focused in areas associated with the processing of stress (interoception). The authors suggested that poor resilience may be due to the inability of the brain to make accurate predictions of physiological state.

Simmons²⁸ studied highly resilient individuals (Navy SEALs) and found that they had decreased brain activity in areas associated with interoception. They proposed that resilience may be caused by decreased reactivity to negative stimuli and an accompanying enhanced ability to efficiently adapt physiological state.

In contrast, Casida *et al.*²⁹ concluded in their work that repressive coping and ‘distraction’ rather than focusing on the event may be beneficial to recovery. Repressive ‘copers’ are people who ‘pay less heed’ to their emotions – they have been shown to report low levels of distress despite being highly physiologically active in autonomic measures³⁰. Bonanno³⁰ provides evidence that ‘repressive coping’ is correlated to high resilience – in certain circumstances, repressive coping may be maladaptive however, in extreme circumstances, repression may allow for enhanced adaptation. The effect of repression may differ with the duration of the stress-exposure. Repression in the short term correlates with poor health and hospital admissions, but in the long-term, repression might not be associated with increased incidence of health problems and is associated with better adaptation and less negative emotions.

Identifying ‘at risk’ (low resilience) individuals

Measuring resilience is key to ‘diagnose’ and to quantify ‘treatment effects’. Due to the lack of certainty regarding the neuroscience of resilience, the use of biomarkers could not yet be validated. Scales investigated for measurement of resilience include the Connor-Davidson Resilience scale (CD-RISC)³, the Resilience Scale³⁶, the Brief Resilience

Role of Psychological Resilience on Health-Outcomes in Hospitalized Patients with Acute Illness: A Scoping Review

Scale³⁷, the Ego Resiliency Scale³⁸ and the perceived stress scale³⁹. There appears to be no single accepted 'best' resilience scale.

Resilience can be related to other disease- and patient-related measures – Rainey⁴⁰ found a negative correlation between resilience levels and depression risk. Self Related Health (SRH)⁴² correlates with low resilience to stressors⁴³. It could be hypothesized that SRH is in fact an indicator of resilience levels – many of the components of resilience (such as optimism and positive outlook and planning for the future) may 'bottle down' to the patient's perception of their own health status.

Rothbaum⁴⁴ found a correlation between specific genes ('low resilience genes') and PTSD after visits to the Emergency Department and inferred that genetic screening using novel fast DNA amplification at point of care might be of value.

Interventions

Non resilience-specific interventions

A small number of papers used psycho-social interventions aimed at reducing psychological morbidity *before* it developed. Resilience was not directly mentioned in any of these papers however, many seemed to focus on strengthening components of resilience such as goal-setting, positive-thinking and gaining a 'sense-of-control' over the situation. Most interventions showed no adverse effects, therefore were considered safe, and most were deemed labour- and cost-efficient.

Interpersonal counselling¹⁸ and debriefing²⁰ have not been found to be beneficial in the acute setting.

Example interventions shown to be successful consisted of 3–5 sessions, either concentrated during the hospital stay or within the next few weeks (rather than spread over the following year). Peris²⁰ evaluated an intra-ICU psychological intervention scheme. The intervention consisted of 5 one-to-one sessions with a clinical psychologist and continuous psychological support by nurses and a supervising psychologist throughout the patients stay. Rothbaum⁴⁴ conducted a trial in ED patients —the intervention involved three sessions, one within twelve hours of the incident, one after a week and the third after a fortnight. It was found that the intervention group had lower rates of PTSD at 4 weeks and 12 weeks and lower depression at 4 weeks.

Resilience-specific interventions

In the preliminary literature review a number of papers were found investigating the efficacy of resilience building programs, most of these were tested in non-patient populations but the authors

indicated that they could be adapted for patient-use. These included training programs^{45,46}, written Bibliotherapy⁴⁷ and computer-based self-led resilience training programs⁴⁸.

The majority of studies used psychological outcome measures in small sample sizes of under 100 patients (Table 2). No papers were found investigating resilience training in the acute hospital setting.

Discussion

We have found very few papers investigating themes around resilience in acute illness/injury. The search results were devoid of papers directly investigating resilience-based interventions in the acute setting.

Our searches were conducted by an expert librarian but we limited searches to the two most commonly used terms in Ovid Medline. It is therefore possible that searches using other related terms might reveal additional research in this area.

Given that the existing literature suggests that acute illness affects psychological wellbeing, and that resilience has been linked to attendance in Emergency Departments, we believe that further exploration of the concept in Acute Medicine might be of benefit. Resilience has the potential to explain why some patients find it easier to recover from acute illness and why others are more affected by the complications of chronic illness.

A group of patients that might be of particular interest could be patients with frequent admissions^{53–55} described as patients who are admitted to acute care four times or more in a year. They are often patients with chronic illnesses that involve acute 'flare ups' such as asthma, diabetes and epilepsy. Most patients with chronic conditions successfully self-manage their condition and adhere to treatment so as to avoid acute scenarios however some individuals are unable to do so. Frequent admission is problematic both due to the adverse effects on the patient (undue stress and exposure to stressors and potential exposure to hospital acquired infections) and the unnecessary burden placed on the health care system⁵⁶. It could be hypothesized that 'resilience' is the determining factor in their health management, and that resilience building tools that have been designed for chronic patients could reduce readmission rates.

Resilience research focused on acute illness/injury is warranted in order to determine whether measurements of resilience predict psychological morbidity in acute illness/injury, whether patients with frequent admissions have below-average resilience levels and whether ways of improving resilience levels results in better outcomes in acute hospital settings.

Role of Psychological Resilience on Health-Outcomes in Hospitalized Patients with Acute Illness: A Scoping Review

Acknowledgements

The authors would like to thank Dr Jenny Byast from the School of Medical Sciences, Bangor University for her support. We are grateful to Jamie McDonald, Stuart Beattie and Ross Roberts from the School of Sport, Health and Exercise Sciences., Bangor

University for advice of measurements tools for resilience. We are indebted to Mrs Nia Jenkins for the assistance in conducting the literature searches.

Declaration of competing interests

Nothing to declare.

References

- Richardson GE. The metatheory of resilience and resiliency. *J Clin Psychol*. 2002;**58**(3):307–21.
- Edward KL, Welch A, Chater K. The phenomenon of resilience as described by adults who have experienced mental illness. *J Adv Nurs*. 2009 Mar;**65**(3):587–95.
- Connor KM, Davidson JRT. Development of a new Resilience scale: The Connor-Davidson Resilience scale (CD-RISC). *Depress Anxiety*. 2003;**18**(2):76–82.
- Cox CE, Docherty SL, Brandon DH, Whaley C, Attix DK, Clay AS, *et al*. Surviving critical illness: acute respiratory distress syndrome as experienced by patients and their caregivers. *Crit Care Med*. 2009;**37**(10):2702–8.
- Liberzon I, Abelson JL, Amdur RL, King AP, Cardneau JD, Henke P, *et al*. Increased psychiatric morbidity after abdominal aortic surgery: risk factors for stress-related disorders. *J Vasc Surg*. 2006;**43**(5):929–34.
- Veldhoven LM Van, Sander AM, Struchen MA, Sherer M, Clark AN, Hudnall GE, *et al*. Predictive ability of preinjury stressful life events and post-traumatic stress symptoms for outcomes following mild traumatic brain injury: analysis in a prospective emergency room sample. *J Neurol Neurosurg Psychiatry* 2011 Jul;**82**(7):782–7.
- Luthar SS, Cicchetti D, Becker B. The construct of resilience: a critical evaluation and guideline for future work. *Child Dev* 2000;**71**(3):543–62.
- Southwick SM, Vythilingam M, Charney DS. The psychobiology of depression and resilience to stress: implications for prevention and treatment. *Annu Rev Clin Psychol*. 2005;**1**:255–91.
- Charney DS. Psychobiological Mechanisms of Resilience and Vulnerability: Implications for Successful Adaptation to Extreme Stress. *Focus J Lifelong Learn Psychiatry*. 2004;**2**(3):368–91.
- Vinson JA. Children with asthma: initial development of the child resilience model. *Pediatr Nurs*. 2002;**28**(2):149–58.
- Yi-Frazier JP, Smith RE, Vitaliano PP, Yi JC, Mai S, Hillman M, *et al*. A person-focused analysis of resilience resources and coping in patients with diabetes. *Stress Heal*. 2010 Feb;**26**(1):51–60.
- Taylor J, Jacoby A, Baker GA, Marson AG, Ring A, Whitehead M. Factors predictive of resilience and vulnerability in new-onset epilepsy. *Epilepsia*. 2011 Mar;**52**(3):610–8.
- O'Malley H, Arksey L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*. 2005;**8**(1):19–32.
- Davydow DS, Zatzick D, Hough CL, Katon WJ. A longitudinal investigation of posttraumatic stress and depressive symptoms over the course of the year following medical-surgical intensive care unit admission. *Gen Hosp Psychiatry*. 2013;**35**(3):226–32.
- van Veldhoven LM, Sander AM, Struchen MA, Sherer M, Clark AN, Hudnall GE, *et al*. Predictive ability of preinjury stressful life events and post-traumatic stress symptoms for outcomes following mild traumatic brain injury: analysis in a prospective emergency room sample. *J Neurol Neurosurg Psychiatry*. 2011;**82**(7):782–7.
- O'Donnell ML, Creamer MC, Parslow R, Elliott P, Holmes A, C, Ellen S, *et al*. A predictive screening index for posttraumatic stress disorder and depression following traumatic injury. *J Consult Clin Psychol*. 2008 Dec;**76**(6):923–32.
- Wiseman T, Foster K, Curtis K. Mental health following traumatic physical injury: An integrative literature review. *Injury*. 2013;**44**(11):1383–90.
- Holmes A, Hodgins G, Adey S, Menzel S, Danne P, Kossmann T, *et al*. Trial of interpersonal counselling after major physical trauma. *Aust N Z J Psychiatry*. 2007;**41**(11):926–33.
- Schandl AR, Brattström OR, Svensson-Raskh A, Hellgren EM, Falkenhav MD, Sackey P V. Screening and treatment of problems after intensive care: A descriptive study of multidisciplinary follow-up. *Intensive Crit Care Nurs*. 2011 Apr;**27**(2):94–101.
- Peris A, Bonizzoli M, Iozzelli D, Migliaccio ML, Zagli G, Bacchereti A, *et al*. Early intra-intensive care unit psychological intervention promotes recovery from post traumatic stress disorders, anxiety and depression symptoms in critically ill patients. *Crit Care. BioMed Central*; 2011 Jan 27;**15**(1):R41.
- Shih RA, Schell TL, Hambarsoomian K, Belzberg H, Marshall GN, R.A. S, *et al*. Prevalence of posttraumatic stress disorder and major depression after trauma center hospitalization. *J Trauma - Inj Infect Crit Care*. 2010 Dec;**69**(6):1560–6.
- Deacon KS. Re-building life after ICU: A qualitative study of the patients' perspective. *Intensive Crit Care Nurs*. 2012 Apr;**28**(2):114–22.
- Papathanassoglou EDE. Psychological support and outcomes for ICU patients. *Nurs Crit Care*. 2010 May-Jun;**15**(3):118–28.
- Fuglsang AK, Moergeli H, Schnyder U. Does acute stress disorder predict post-traumatic stress disorder in traffic accident victims? Analysis of a self-report inventory. *Nord J Psychiatry*. 2004;**58**(3):223–9.
- Mellman T a, David D, Bustamante V, Fins a I, Esposito K. Predictors of post-traumatic stress disorder following severe injury. *Depress Anxiety*. 2001 Jan;**14**(4):226–31.
- Va I, Gonza B, Marcos-vela P. Repression and Coping Styles in Asthmatic Patients. *J Clin Psychol Med Settings* 2010 Sep;**17**(3):220–9.
- Haase L, Stewart JL, Youssef B, May AC, Isakovic S, Simmons AN, *et al*. When the brain does not adequately feel the body: Links between low resilience and interoception. *Biol Psychol* 2016 Jan 1;**113**:37–45.
- Simmons AN, Fitzpatrick S, Strigo I a., Potterat EG, Johnson DC, Matthews SC, *et al*. Altered insula activation in anticipation of changing emotional states. *Neuroreport*. 2012;**23**(4):234–9.
- Casida JM, Marcuccilli L, Peters RM, Wright S. Lifestyle adjustments of adults with long-term implantable left ventricular assist devices: A phenomenologic inquiry. *Hear Lung J Acute Crit Care*. 2011 Nov;**40**(6):511–20.
- Bonanno G a. Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *Am Psychol*. 2004 Jan;**59**(1):20–8.
- Kan EZ. Perceptions of Recovery, Physical Health, Personal Meaning, Role Function, and Social Support After First-Time Coronary Artery Bypass Graft Surgery. *Dimens Crit Care Nurs*. 2009 Jul-Aug;**28**(4):189–95.
- Mendes B, Roux G, Ridosh M. Phenomenon of inner strength in women post-myocardial infarction. *Crit Care Nurs Q*. 2010;**33**(3):248–58.
- Rainey E.E. M s . . b, Petrey LB., Reynolds M. M s . . b, Agtarap S. B a . ., Warren A.M. PD. b. Psychological factors predicting outcome after traumatic injury: The role of resilience. *Am J Surg*. 2014;**208**(4):517–23.
- Tirkkonen J, Ylä-Mattila J, Olkkola KT, Huhtala H, Tenhunen J, Hopppu S. Factors associated with delayed activation of medical emergency team and excess mortality: an Utstein-style analysis. *Resuscitation*. 2013;**84**(2):173–8.

Role of Psychological Resilience on Health-Outcomes in Hospitalized Patients with Acute Illness: A Scoping Review

35. Strahan EHE, Brown RJ. A qualitative study of the experiences of patients following transfer from intensive care. *Intensive Crit Care Nurs.* 2005 Jun;**21**(3):160–71.
36. Wagnild GM, Young HM. Development and psychometric evaluation of the Resilience Scale. *J Nurs Manag.* 1993;**1**(2):165–78.
37. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med.* 2008;**15**(3):194–200.
38. Alessandri, G; Vecchione, M.; Caprara, G.; Letzing TD. The Ego Resiliency Scale Revised. *Eur J Psychol Assess.* 2012;**28**(2):139–46.
39. Cohen S. Perceived Stress Scale. *Psychology.* 1994;1–3.
40. Rainey EE, Petrey LB, Reynolds M, Agtarap S, Warren AM, Ph D. Psychological factors predicting outcome after traumatic injury: the role of resilience. *Am J Surg . Elsevier Inc;* 2014;**208**(4):517–23.
41. Richmond TS, Ruzek J, Ackerson T, Wiebe DJ, Winston F, Kassam-Adams N. Predicting the future development of depression or PTSD after injury. *Gen Hosp Psychiatry.* 2011 Jul;**33**(4):327–35.
42. Jylhä M. What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Soc Sci Med* 2009;**69**(3):307–16.
43. Martin CM. Self-rated health: Patterns in the journeys of patients with multi-morbidity and frailty. *J Eval Clin Pract.* Blackwell Publishing Ltd; 2014 Dec 1;**20**(6):1010–6.
44. Rothbaum BO, Kearns MC, Reiser E, Davis JS, Kerley KA, Rothbaum AO, *et al.* Early intervention following trauma may mitigate genetic risk for PTSD in civilians: A pilot prospective emergency department study. *J Clin Psychiatry.* Physicians Postgraduate Press Inc.; 2014 Dec 1;**75**(12):1380–7.
45. Wachs P, Saurin TA, Righi AW, Wears RL. Resilience skills as emergent phenomena: A study of emergency departments in Brazil and the United States. *Appl Ergon* 2015 Nov 9;**56**:227–37.
46. Ray-Sannerud BN, Leyshon S, Vallevik VB. Introducing Routine Measurement of Healthcare Worker's Well-being as a Leading Indicator for Proactive Safety Management Systems Based on Resilience Engineering. *Procedia Manuf.* 2015;**3**:319–26.
47. Sharma V, Sood A, Prasad K, Loehrer L, Schroeder D, Brent B. Bibliotherapy to decrease stress and anxiety and increase resilience and mindfulness: a pilot trial. *Explore (NY).* 2014 Jul 1;**10**(4):248–52.
48. Rose RD, Buckey JC, Zbozinek TD, Motivala SJ, Glenn DE, Cartreine JA, *et al.* A randomized controlled trial of a self-guided, multimedia, stress management and resilience training program. *Behav Res Ther.* 2013 Feb;**51**(2):106–12.
49. Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-Based Stress Reduction and Health Benefits. A Meta-Analysis. *J Psychosom Res.* 2004;**57**(1):35–43.
50. Dougherty CM, Lewis FM, Thompson EA, Baer JD, Kim W. Short-term efficacy of a telephone intervention by expert nurses after an implantable cardioverter defibrillator. *PACE - Pacing Clin Electrophysiol.* 2004 Dec;**27**(12):1594–602.
51. Combe D. The use of patient diaries in an intensive care unit. *Nurs Crit Care.* 2005;**10**(1):31–4.
52. Hunter BC, Oliva R, Sahler OJZ, Gaisser D, Salipante DM, Arezina CH. Music therapy as an adjunctive treatment in the management of stress for patients being weaned from mechanical ventilation. *J Music Ther.* 2010;**47**(3):198–219.
53. Grover CA. Frequent Users of the Emergency Department: Risky Business. 2009;**X**(August):193–4.
54. Doupe MB, Palatnick W, Day S, Chateau D, Soodeen RA, Burchill C, *et al.* Frequent users of emergency departments: Developing standard definitions and defining prominent risk factors. *Ann Emerg Med.* 2012 Jul;**60**(1):24–32.
55. Hunt KA, Weber EJ, Showstack JA, Colby DC, Callahan ML. Characteristics of Frequent Users of Emergency Departments. *Ann Emerg Med.* 2006 Jul;**48**(1):1–8.
56. Billings J, Dixon J, Mijanovich T, Wennberg D. Case finding for patients at risk of readmission to hospital: development of algorithm to identify high risk patients. *BMJ.* 2006;**333**(7563):327.
57. Sharma V, Bauer B, Prasad K, Schroeder D. Self help intervention to decrease stress and increase mindfulness: A pilot trial. *BMC Complementary and Alternative Medicine.* 2012. **12** (suppl 1): P253.