Published in final edited form as:
Int J Nurs Stud. 2012 March ; 49(3): 292–299. doi:10.1016/j.ijnurstu.2011.09.015.

The presence of resilience is associated with a healthier psychological profile in ICU nurses: Results of a national survey

Meredith Mealer, RN, MS[1], **Jacqueline Jones, RN, PhD**[2], **Julia Newman**[1], **Kim K. McFann, PhD**[3], **Barbara Rothbaum, PhD**[4], and **Marc Moss, MD**[1]

[1]Division of Pulmonary Sciences and Critical Care Medicine, Department of Medicine, University of Colorado School of Medicine, Aurora, CO

[2]College of Nursing, University of Colorado Anchutz Medical Campus, Aurora, CO

[3]Department of Preventive Medicine and Biometrics, University of Colorado Denver, Aurora, CO

[4]The Department of Psychiatry, Emory University School of Medicine, Atlanta, Georgia

Abstract

Objective—ICU nurses are repeatedly exposed to work related stresses resulting in the development of psychological disorders including posttraumatic stress disorder and burnout syndrome. Resilience is a learnable multidimensional characteristic enabling one to thrive in the face of adversity. In a national survey, we sought to determine whether resilience was associated with healthier psychological profiles in intensive care unit nurses.

Design—Surveys were mailed to 3500 randomly selected ICU nurses across the United States and included: demographic questions, the Posttraumatic Diagnostic Scale, Hospital Anxiety and Depression Scale, Maslach Burnout Inventory and the Connor-Davidson Resilience Scale.

Measurements and Main Results—Overall, 1239 of the mailed surveys were returned for a response rate of 35%, and complete data was available on a total of 744 nurses. Twenty-two percent of the intensive care unit nurses were categorized as being highly resilient. The presence of high resilience in these nurses was significantly associated with a lower prevalence of posttraumatic stress disorder, symptoms of anxiety or depression, and burnout syndrome (<0.001 for all comparisons). In independent multivariable analyses adjusting for five potential confounding variables, the presence of resilience was independently associated with a lower prevalence of posttraumatic stress disorder ($p < 0.001$), and a lower prevalence of burnout syndrome ($p < 0.001$).

Conclusions—The presence of psychological resilience was independently associated with a lower prevalence of posttraumatic stress disorder and burnout syndrome in intensive care unit nurses. Future research is needed to better understand coping mechanisms employed by highly resilient nurses and how they maintain a healthier psychological profile.

Keywords

Resilience; posttraumatic stress disorder; burnout syndrome; ICU nurses

Please address all correspondence to: Meredith Mealer, RN, MS, Research Instructor, Pulmonary Sciences and Critical Care Medicine, 12700 E. 19th Ave.; C-272, Aurora, CO 80045, Phone 303-724-6080, Fax 303-724-6036, Meredith.Mealer@ucdenver.edu.

There is a global shortage of nurses, particularly in specialty areas such as the intensive care unit (ICU) (Buchan & Aiken, 2008; Jastremski, 2006; Oulton, 2006). The reasons for this international crisis are multi-factorial, yet one important component is the accelerated departure of nurses from their profession due to dissatisfaction with the work environment. In a study of nurses in the United States, Canada, England, Scotland, and Germany, 41% of hospital nurses were not satisfied with their jobs and 22% planned on leaving the profession in less than a year (Aiken et al, 2001). ICU nurses are repeatedly exposed to work related stresses involving patients under their direct care, including: addressing end of life issues, performing cardiopulmonary resuscitation, involvement in post-mortem care, and prolonging life by artificial support (Mealer et al, 2007). Furthermore, ICU nurses have an increased prevalence of job-related burnout syndrome and posttraumatic stress disorder when compared to general medical/surgical nurses (Embriaco, 2007; Mealer et al, 2009; Poncet, 2007) suggesting that work related stress is one cause of voluntary ICU nursing turnover (Aiken et al, 2001; Finlayson, Aiken & Nakarada-Kordic, 2007; McHugh et al, 2011). High ICU nursing turnover rates directly increase healthcare costs, limit productivity, and reduce the quality of care as experienced nurses who leave the ICU must be replaced (Steinbrook, 2002).

Resilience is a multidimensional characteristic that embodies the personal qualities that enable one to thrive in the face of adversity (Charney, 2004; Connor & Davidson, 2003; Davidson et al, 2005). Resilience can be learned and psychologists have identified factors that promote resilience such as individual temperaments, family bonds, and external support systems. Personal qualities associated with resilience include the ability to engage the support of others, optimism, faith, the belief that stress can be strengthening, and striving towards personal goals (Charney, 2004; Hoge et al, 2007; Luthar et al, 2000). Resilience has recently been recognized as one of the most important factors when assessing adjustment following trauma. It has also been postulated to assist in preventing the development of PTSD symptoms (Luthar et al, 2000). However, the potential association between resilience and psychological symptoms in ICU nurses is completely unexplored. This study used a resilience conceptual framework focusing on psychosocial strengths and was informed by Charney's work identifying ten psychological characteristics of resilience that can be learned through cognitive behavioral therapy (Milne, 2007). We hypothesized that the presence of resilience in ICU nurses would be associated with a lower prevalence of symptoms of posttraumatic stress disorder and burnout syndrome that is potentially mediated through the presence of problem focused coping mechanisms and adaptive responses. To test this hypothesis, we conducted a national survey to determine the prevalence of resilience in ICU nurses and to determine whether its presence is associated with fewer psychological symptoms.

Methods

The American Association of Critical-Care Nurses (AACN) is the largest nursing specialty organization representing the interests of more than 500,000 critical care nurses. With its assistance, we obtained a mailing list for 3500 randomly selected registered critical care nurses in the United States. The nurses were randomly selected from AACN's membership list and were not based on current employment status. This sample size was determined by the maximum number of addresses that are allowed by the AACN. c. Surveys were mailed in an anonymous manner according to standard survey principles (Dillman, 1978; Hebert, 1998). A reminder card was sent 2 weeks later, followed by the mailing of a second survey 1 month after the first. These are established strategies to enhance response rate (Dillman, 1978). This study was approved by the University of Colorado Multiple Institutional Review Board.

The survey included a cover letter stating that the purpose of the study was to gain knowledge about the ICU environment and its effect on the nursing population. The survey questionnaire required approximately 20 minutes to complete. The first section consisted of demographic questions including: martial status, age, race, ethnicity, and highest nursing degree earned. The second part of the survey consisted of questions related to the work environment including: years practicing as a nurse, primary shift, nurse-patient ratio, and type of ICU. In addition, the second part included an open-ended question asking for a summary of why the participant decided to become a nurse. The answer to this question was categorized into four responses: to help and care for people, prior experience in healthcare or family member was in the nursing profession, economic reasons, or a general interest in nursing-related sciences. Each person could be categorized into more than one group depending on their answers. The survey also included the following four validated instruments.

1. The Hospital Anxiety and Depression Scale (HADS) is a 14-item self-report screening scale originally developed to indicate the possible presence of anxiety and depression states in the setting of a medical, nonpsychiatric outpatient clinic. HADS consists of a 7-item anxiety subscale and a 7-item depression subscale. A score of > 8 identifies those with a positive history for anxiety and/or depression (Aylard et al, 1987; Bjelland et al, 2002; Mealer et al, 2009). The validity of the HADS has been extensively studied for identifying anxiety and depression disorders in a variety of populations including the general population, general practice and psychiatric patients (Aylard et al, 1987; Bjelland et al, 2002; Mealer et al, 2009). In our analysis, the Cronbach's alpha was 0.86 for the Hospital Anxiety and Depression Scale (HADS).

2. The Posttraumatic Diagnostic Scale (PDS) is a validated, self-report tool that yields both a PTSD diagnosis according to the diagnostic and statistical manual of mental disorders fourth edition (DSM-IV) criteria and a measure of PTSD symptom severity. While the gold standard for diagnosing PTSD is the clinician-administered PTSD scale (CAPS), the PDS is highly correlated with the clinician-rated measures diagnosing PTSD (Foa et al, 1997; Mueser, 2001; Sheeran & Zimmerman, 2002). It consists of a screener for Criterion A events, a checklist of 12 traumatic events (including an "other" category), and Criteria B, C, and D that assess the 17 DSM-IV symptoms by using a 4-point scale (0=not at all or only one time; 3=five or more times a week/almost always). A total score is calculated by: having had a traumatic event, feeling helpless or terrified during the event (criterion A), and at least one episode of a *re-experiencing* symptom (criterion B), three *avoidance* symptoms (criterion C), and two *arousal* symptoms (criterion D). Symptom severity can be calculated by summing scores of the 17 items addressed in Criterion B, C, and D (Mealer et al, 2009) For the purpose of this study, nurses were asked complete Criterion A on traumatic events that were only experienced while working in the ICU environment, and nurses were asked to fill out Criteria B, C, and D only based upon those events. The PDS also has a section that asks how the problems rated in Criterion B, C, and D have interfered with any of the following areas of life functioning within the past month: work, household chores and duties, relationships with friends, fun and leisure activities, schoolwork, relationships with your family, sex life, general satisfaction with life, and overall level of functioning in all areas of your life. The PDS is a well accepted and validated survey instrument to diagnose individuals with PTSD (Foa et al, 1997; Mealer et al, 2009) with high internal consistency reliability (Cronbach's α range 0.78–0.92). In addition, test-retest reliability coefficients of the total PDS score demonstrated satisfactory reliability: 0.83 for total symptom severity, 0.77 for re-experiencing, 0.81 for avoidance, and 0.85 for arousal (Foa et al, 1997; Mealer et al, 2009).

3. The Maslach Burnout Inventory (MBI) is a 22-item self-report questionnaire consisting of three independently scored dimensions (Leiter & Maslach, 1999; Maslach et al, 2001; Mealer et al, 2009). The MBI is copyright protected and permission was obtained prior to mailing the surveys. The questionnaire includes questions regarding the frequency of experiencing certain feelings related to a participant's work environment on a 7-point Likert scale. The emotional exhaustion (EE) scale, consisting of 9 items, identifies those individuals who are emotionally exhausted or overextended at work. The depersonalization (DP) scale, consisting of 5 items, identifies those individuals who have an impersonal response towards recipients of their efforts. The personal accomplishment (PA) scale, consisting of 8 items, assesses lack of accomplishment and success related to work. This investigation scored subjects as having moderate to high levels of burnout syndrome with the following values: EE > 17, DP > 7, and PA > 31(Maslach et al, 1996; Mealer et al, 2009; MBI-Human Services Survey, copyright 1986 by CPP, Inc.). The MBI is a burnout tool that has been tested extensively for reliability and validity and internal consistency. Previous reported values for Cronbach's coefficient alpha have been in the range of 0.71–0.90 (Gil-Monte, 2005; Kalliath et al, 2000; Leiter & Maslach, 1999). In our analysis, the Cronbach's alpha for the MBI – Human Service Survey was 0.81. alpha on each of the 3 dimensions was: EE $\alpha = 0.53$, DP $\alpha = 0.72$, and PA $\alpha = 0.91$.

4. 4. The Connor-Davidson Resilience Scale (CD-RISC) was utilized to assess resilience (Connor & Davidson, 2003). The CD-RISC was developed as a short self-report assessment to quantify resilience and as a clinical measure to assess treatment response. The CD-RISC is copyright protected and permission was obtained prior to mailing the surveys. It is a 25 item self-report scale with total score ranges from 0–100. Higher scores reflect greater resilience. Resilience is defined as a CD-RISC score of >80 with a median score of 82. Highly resilient is defined as one standard deviation greater than the mean and therefore a score of ≥ 92 is defined as a positive score for being highly resilient (Campbell et al, 2009; Connor & Davidson, 2003). The CD-RISC has been extensively used in community samples, primary care outpatients, general psychiatric outpatients, a clinical trial of generalized anxiety disorder, and two clinical trials of PTSD. The CD-RISC maintains excellent reliability (Cronbach's alpha 0.89) and a test-retest reliability correlation of 0.87 (Connor & Davison, 2003). For our analysis, the Cronbach's alpha for the Connor-Davidson Resilience Scale was 0.92.

Statistical analysis

Normally distributed data were reported as means and compared using a student's T test (2-tailed), a chi^2 analysis, or Fisher's exact test. ANOVA analysis was performed to compare three or more group means on a single response variable. Cronbach's alpha was computed for the HADS, CD-RISC and MBI instruments in order to assess internal reliability of the questions. The range of Cronbach's alpha is 0 to 1.0, with larger values indicating good internal reliability of the instrument (i.e. all items in an instrument are measuring the same underlying construct). Internal consistency was established for each instrument using Cronbach's alpha.

Multivariable logistic regression analyses were performed. In all of the analyses, the primary exposure variable of interest was the presence of high resilience, classified as present or absent. The outcome variables for the multivariable analyses were a diagnosis of posttraumatic stress disorder (yes/no), presence of burnout syndrome (yes/no), a HADS-anxiety score > 8 (yes/no), a HADS-depression score > 8 (yes/no), and a lack of interference with their general satisfaction with life (yes/no). In the first four analyses, the effect of the

following five potential confounding variables were evaluated: sex, age as a continuous variable, primary shift, type of ICU, and whether the respondent entered the nursing profession due to a desire to help and care for people (yes/no), a prior healthcare experience (yes/no), economic reasons (yes/no), and a general interest in medicine/science (yes/no). In the fifth analysis, the effect of two independent confounding variables were evaluated: a diagnosis of posttraumatic stress disorder (yes/no), and the presence of burnout syndrome (yes/no). The backward elimination modeling strategy proposed by Kleinbaum (Moss et al, 2003) was used in all multivariable analyses. There was no significant collinearity between any of the independent variables. The primary exposure variable (the presence of high resilience) and all of the confounding variables were initially placed in the model. Removal of any individual confounding variable was allowed if it resulted in no alteration in the odds ratio yet improved its precision. Ninety-five percent confidence intervals were determined for each independent variable in the multivariable logistic regression model. Goodness of fit was determined for each model using the Hosmer-Lemeshow statistic. An alpha value of 0.05 was used for all statistical tests.

Results

Of the 3500 mailed surveys, 1239 were completed and returned for a response rate of 35%. A total of 458 of these surveys were excluded because the nurse no longer worked in the ICU and therefore did not complete the survey. An additional 37 surveys were excluded because of incomplete demographic information. Individuals from all 50 states were represented. The study population was predominantly non-Hispanic women, the majority of whom had a bachelor's degree in nursing. On average the respondents were 44 years old, and had been practicing nursing for 18 years (Table 1).

Of the 744 ICU nurses who completed the survey, 18% were positive for symptoms of anxiety and 11% were positive for symptoms of depression. There was a high rate of burnout syndrome with 80% of nurses having positive symptoms in at least one of the three individual dimensions: 61% were positive for emotional exhaustion, 44% were positive for depersonalization, and 50% were positive for lack of personal accomplishment. The suggested prevalence of a diagnosis of posttraumatic stress disorder as assessed by the PDS was 21% with 70% of those nurses having symptoms for greater than three months (Table 1). Criterion A of the PDS was based on a traumatic event experienced while working in the ICU environment and was most commonly reported as not being able to save a patient (50%), seeing patients die (29%), performing futile care (36%), and verbal abuse by family members (39%).

Overall, 22% [(157/725); 95% CI = 19–25%] of the ICU nurses were highly resilient, defined as a CD-RISC score of ≥ 92. There was a small but significant increase in the age and decreased number of years practiced of highly resilient ICU nurses compared to the ICU nurses who were not highly resilient (p=0.03 and p=0.05, respectively) (Table 2). The presence of resilience was associated with a significantly lower prevalence of a suggestive diagnosis of posttraumatic stress disorder (8%) compared to those who were not highly resilient (25%), p <0.001. Similarly, the presence of resilience (defined as a CD-RISC score of ≥ 92) was associated with fewer symptoms of anxiety (8%, vs. 21%, p=0.003) or depression (2%, vs. 14%, p<0.001). Symptoms consistent with burnout syndrome were also significantly lower in highly resilient nurses in all three dimensions (p<0.001 for all three dimensions) (Table 3). The majority of respondents (67%) entered the nursing profession because they wanted to help and care for people. The prevalence of symptoms of anxiety and depression, a suggestive diagnosis of posttraumatic stress disorder, and resilience were not different according to the reason why the respondents chose to be a nurse. However, entering the nursing profession in order to help and care for people, was associated with

negative scores in the burnout syndrome dimension of depersonalization, p=0.03 when compared to those respondents who did not choose to be a nurse because they wanted to help and care for patients. Additionally, entering the nursing profession for economic reasons was associated with positive scores in the burnout syndrome depersonalization (p=0.005).

The associations between resilience and four outcome variables (a suggestive diagnosis of posttraumatic stress disorder, the presence of burnout syndrome, symptoms of anxiety, and symptoms of depression) were tested in individual multivariable logistic regression models while adjusting for gender, age, the reason for choosing the nursing profession, primary shift, and type of ICU. The presence of high resilience was independently associated with the absence of a diagnosis of posttraumatic stress disorder ($p < 0.001$, OR = 0.27, 95% CI = 0.13–0.52), the absence of burnout syndrome ($p < 0.001$, OR = 0.22, 95% CI = 0.13–0.33), the absence of symptoms of anxiety ($p = 0.006$, OR = 0.26, 95% CI = 0.11–0.53), and the absence of symptoms of depression ($p = 0.001$, OR = 0.10, 95% CI = 0.02–0.31). Nurses with high resilience were less likely to report problems related to work ($p < 0.001$), performing household chores ($p < 0.001$), maintaining relationships with friends ($p < 0.001$), fun and leisure activities ($p= 0.001$), maintaining relationships with family ($p < 0.001$), sex life ($p < 0.001$), general satisfaction with life ($p < 0.001$), and overall level of functioning in all areas of life (< 0.001) (Table 4). The association between high resilience and answers to the question of whether work related problems had interfered with general satisfaction with life was examined in a multivariable logistic regression analysis. After adjusting for a suggestive diagnosis of posttraumatic stress disorder or burnout syndrome, resilient nurses were more likely to report general satisfaction with their lives ($p = 0.002$, OR = 2.62 95% CI = 1.39–5.34) than less resilient nurses.

Discussion

In this national survey, we confirmed our previous findings that psychological disorders such as presumed posttraumatic stress disorder, anxiety, depression, and burnout syndrome are common in ICU nurses (Mealer et al, 2009). The literature tells us that there is a connection between resilience and the subsequent development of posttraumatic stress disorder and psychological symptoms (Charney, 2004; Haglund et al, 2007; Yehuda et al, 2006).We identified that resilience is present in a subset of ICU nurses and associated with a significantly decreased prevalence of presumed posttraumatic stress disorder, burnout syndrome, and symptoms of anxiety and depression. Based on Charney's conceptual model of resilience, this cohort possessed all ten psychological characteristics of resilience that can be learned and most commonly identified with having developed a personal moral compass or set of beliefs through spirituality and development of a supportive social network Highly resilient nurses were less likely to allow their work environment to interfere with their overall life functioning when away from work. Therefore resilience may serve as a protective mechanism to prevent symptoms associated with psychological disorders related to a stressful ICU work environment. Because resilience can be learned, educational programs for ICU nurses may result in fewer distress symptoms, improved job satisfaction, and potentially decrease the high turnover rate for ICU nurses.

The nursing shortage is most noticeable in specialty areas such as the intensive care unit (ICU) and has been documented in many countries around the world (Albarran & Scholes, 2005; Scribante, Schmollgruber & Nel, 2004; Stechmiller, 2002). The World Health Organization (WHO) has reported that there are 57 countries with critical shortages of healthcare professionals representing a global deficit of 2.4 million doctors, nurses, and midwives with the largest percentage of the deficit belonging to nurses (Buchan & Aiken, 2008). Canada has reported a nurse turnover rate in hospitals of 20% with an average

associated cost of $25,000 per nurse (Canadian Nurses Association, 2009), France loses 18,000 nurses from the hospital setting each year, Jamaica loses 8% of nurses with more than 20% coming from specialty areas (Oulton, 2006), and the United States has reported a turnover rate for ICU nurses as high as 25–60% with a cost to each individual hospital to be as much as $2,100,00 per year (Report to the Chairman, 2001). In developing countries there is a dramatic crisis with Africa estimating the shortage at 600,000 nurses. In addition to the economic burden, other consequences of the nursing shortage include poor patient outcomes and reduced quality of care as well as the detrimental personal effects to the individual nurse such as job dissatisfaction and psychological stress (Finlayson, Aiken & Nakarada-Kordic, 2007; Oulton, 2006).

Our study identifies a cohort of critical care nurses who have been exposed to extreme forms of stress while working in the ICU but have not developed anxiety, depression, or posttraumatic stress disorder. There are both biologic and psychological factors that enabled these nurses to be resilient when confronted by severe stress. Ten psychological characteristics can be learned to help increase resilience, including: optimism, developing cognitive flexibility, developing a personal moral compass or set of beliefs, altruism, finding a resilient role-model or mentor, learning to be adept at facing fear, developing active coping skills, having a supportive social network, exercising, and having a sense of humor (Milne, 2007; Southwick, M., Ozbay, F., Charney, D. & McEwen, B.). In order to retain experienced ICU nurses, future qualitative research is needed to better understand what coping strategies and psychological characteristics are employed by resilient nurses in the ICU to help buffer severe stress from the cumulative exposure to traumatic experiences. Potential organization strategies to promote resilience in the ICU work environment could involve programs including: education and training to optimize coping mechanisms, formal and informal debriefings following a traumatic exposure, resilient nurse champions or modeling, motivational interviewing, and cognitive behavioral therapies (Charney, 2004). Implementing these strategies and fostering certain personal characteristics could lead to nurses who will thrive in bedside nursing for extended periods of time, thereby ameliorating the current global nursing shortage. Examining resilient nurses provides valuable insights that may facilitate the development of interventions to foster resilience in nurses who are vulnerable to psychopathology. Additionally, empowering work environments that promote perceptions of autonomy, access to resources, and positive support systems have been associated with job satisfaction and positive organizational outcomes (Aiken, Smith & Lake, 1994; Buchan, 1999; Wade, 1999).

Our study is limited by the relative racial and gender homogeneity of the sample; however, the demographics of our sample are similar to the nursing demographics nationwide (The Registered Nurse Population, 2008). Only 22% of ICU nurses were scored as being highly resilient. If we had chosen to study the broader group of resilient instead of highly resilient nurses, our study might have yielded differing results. However, highly resilient nurses have been compared to psychological health in prior studies (Campbell, Cohan & Stein, 2006). The average age of our cohort was 44 years and their average length of time working as a nurse was 18 years. Therefore, the results of our study might not be generalizability to all ICU nurses. Individuals were diagnosed with posttraumatic stress disorder using a self-report diagnostic tool (the PDS) instead of the gold standard CAPS. However, this tool has an advantage over other self-report measures for posttraumatic stress disorder because it corresponds with all six criteria of the DSM-IV diagnosis. Moreover, it is a well-validated tool with excellent reliability and accuracy, and highly correlates with clinician-rated measures diagnosing posttraumatic stress disorder (Foa & Meadows, 1997; Griffin et al, 2004; Mueser et al, 2001). We did not measure the construct of coping, which could be a potential mediating factor in the development of posttraumatic stress disorder and burnout syndrome. Results of surveys must always be interpreted with caution due to limitations in

response rate that may alter the external validity of their results. However we were able to obtain information from over 700 ICU nurses. It is possible that we may have overestimated or underestimated the frequency of psychological problems. Additionally, we did not ask this population of nurses if they had ever been exposed to a traumatic event outside of the work environment. Subsequent determination of the lifetime history of traumatic exposures holds important implications for the subsequent development of posttraumatic stress disorder. While we reported that highly resilient nurses were more likely to function with resilience in daily life, future studies are needed to assess whether resilience in daily life predicts healthy psychological functioning at work. Finally, the individuals who completed this survey were ICU nurses who were members of the AACN and may have important differences from the majority of ICU nurses. Therefore the results of this survey may not be generalizable to those nurses who are not members of this professional society.

In conclusion, ICU nurses who are highly resilient are significantly less likely to develop psychological disorders including posttraumatic stress disorder and burnout syndrome. Highly resilient nurses are also less likely to have altered perceptions related to their work environment and life outside of work. Additionally, highly resilient nurses embody all of the psychological characteristics of resilience outline in Charney's model of resilience. Future research aimed at in-depth qualitative interviews to better understand how highly resilient nurses are able to use positive coping skills and psychological characteristics are needed to prevent the development of these disorders and ameliorate symptoms in nurses who are not highly resilient. Information gained from subsequent investigations can be used to develop resilience training programs promoting positive adaptive responses to severe stress and trauma exposure, that will help improve the work environment and mitigate the unusually high nursing turnover rate in the ICU.

What is already known about the topic?

Symptoms of posttraumatic stress disorder, burnout syndrome, anxiety and depression are common in the intensive care unit nurse.

Resilience is a psychological characteristic that enables one to thrive after being exposed to a traumatic event.

What this paper adds

Intensive care unit nurses with high levels of resilience are less likely to develop psychological disorders.

Highly resilient intensive care unit nurses are less likely to have altered perceptions related to their work environment and life outside of work.

Acknowledgments

Contract grant sponsor: NIH; Contract grant number: K24 HL-089223

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Table 1

Demographic information for entire cohort

Category	Result
Gender:	
% Female	91 (674/744)
Age (mean ± SD)	43.6 ± 11.0
% Exercise regularly	62 (458/744)
Marital status (percent):	
Single	16 (119/744)
Married	67 (502/744)
Other	17 (123/744)
Type of Unit (percent):	
Medical	35 (262/744)
Surgical	10 (77/744)
Cardiac	11 (79/744)
Cardiothoracic	9 (68/744)
Pediatric	4 (29/744)
Other	31 (229/744)
Highest degree (percent):	
Associates	20 (147/744)
Bachelors	57 (421/744)
Other	23 (176/744)
Years practiced (mean ± SD)	17.8 ± 11.7
Reason for becoming a nurse (percent):	67 (409/609)
Help and care for people	19 (118/609)
Family member or healthcare experience	22 (136/609)
Economical reasons	25 (153/609)
Medicine or science interest	
PDS: % PTSD diagnosis	21 (156/740)
HADS:	
% Anxiety positive	18 (136/742)
Anxiety score (mean ± SD)	12.5 ± 3.0
% Depression positive	11 (84/742)
Depression score (mean ± SD)	10.6 ± 1.8
MBI:	
% BOS positive	80 (588/734)
% EE positive	61 (450/736)

Category	Result
EE score (mean ± SD)	34.2 ± 10.6
% DP positive	44 (326/736)
DP score (mean ± SD)	13.5 ± 8.2
% PA positive	51 (370/730)
PA score (mean ± SD)	40.0 ± 5.0

PDS=Posttraumatic Diagnostic Scale, HADS=Hospital Anxiety and Depression Scale, MBI=Maslach Burnout Inventory, BOS=burnout Syndrome, EE=emotional exhaustion, DP=depersonalization, PA= personal accomplishment

Table 2

Demographic information for Highly Resilient vs. Not Highly Resilient

Category	Highly Resilient (n=157)	Not Highly Resilient (n=568)	p value
Gender			
% Female	90%	91%	0.88
Age (in years)	45 ± 10	43 ± 11	0.03
% Exercise regularly	61%	67%	0.19
Martial status:			0.60
Single	16%	13%	
Married	67%	68%	
Other	17%	19%	
Type of Unit:			0.36
Medical	31%	36%	
Surgical	13%	10%	
Cardiac	10%	11%	
Cardiothoracic	10%	9%	
Pediatric	2%	4%	
Other	34%	30%	
Highest Degree			0.24
Associates	23%	19%	
Bachelors	50%	58%	
Other	27%	23%	
Years practiced (in years)	17.5 ±11.7	19.5 ± 11.5	0.05

Table 3

Prevalence of psychological symptoms

Category	Highly Resilient	Not Highly Resilient	p value
HADS: anxiety symptoms	8% (13/155)	21% (120/567)	<0.001
HADS: depression symptoms	2% (3/156)	14% (80/566)	<0.001
PDS: PTSD diagnosis	8% (13/157)	25% (139/564)	<0.001
BOS: emotional exhaustion symptoms	43% (66/155)	66% (373/562)	<0.001
BOS: depersonalization symptoms	28% (43/156)	49% (276/561)	<0.001
BOS: personal accomplishment symptoms	28% (42/152)	57% (318/559)	<0.001
Any BOS symptoms	61% (92/152)	85% (480/563)	<0.001

HADS=Hospital Anxiety and Depression Scale, PDS=Posttraumatic Diagnostic Scale, BOS=burnout syndrome

Table 4

Effects on life outside of the hospital during the past month in Highly Resilient ICU nurses versus Not-Highly Resilient ICU nurses

Category	Highly Resilient (n=157)	Not-Highly Resilient (n=567)	p value
Household chores and duties	7%	21%	<0.001
Relationships with friends	5%	21%	<0.001
Fun and leisure activities	9%	22%	0.003
Schoolwork	3%	9%	0.008
Relationships with their family	7%	21%	<0.001
Sex life	5%	20%	<0.001
General Satisfaction in life	8%	27%	<0.001
Overall level of functioning in all areas of their life	5%	22%	<0.001