Symptoms of Acute Posttraumatic Stress Disorder After Intensive Care
Karen Wallen, Wendy Chaboyer, Lukman Thalib and Debra K. Creedy

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SYMPTOMS OF ACUTE POSTTRAUMATIC STRESS DISORDER AFTER INTENSIVE CARE

By Karen Wallen, RN, MN (Hons), Wendy Chaboyer, RN, PhD, Lukman Thalib, BSc(H), MSC, PhD, and Debra K. Creedy, RN, PhD

Background. Admission to intensive care is often a sudden and unexpected event precipitated by a life-threatening condition, 2 determinants thought to influence the development of posttraumatic stress disorder.

Objectives. To identify the frequency of acute symptoms of posttraumatic stress disorder and to describe factors predictive of these symptoms in patients 1 month after discharge from intensive care.

Methods. In this prospective cohort study, all patients meeting the inclusion criteria during the study period were invited to participate. Participants completed the Impact of Event Scale-Revised, and demographic and clinical data were accessed from an intensive care unit database.

Results. During a 9-month period, 114 of 137 patients who met the inclusion criteria consented to participate in the study, and 100 (88%) completed it. The mean total score on the Impact of Event Scale-Revised was 17.8 (SD, 13.4; possible range, 0-88). A total of 13 participants (13%) scored higher than the cutoff score for clinical posttraumatic stress disorder. Neither sex nor length of stay was predictive of acute symptoms of posttraumatic stress disorder. In multivariate analysis, the only independent predictor of symptoms was age. Patients younger than 65 years were 5.6 times (95% confidence interval, 1.17-26.89) more likely than those 65 years and older to report symptoms.

Conclusion. The rate of symptoms of posttraumatic stress disorder 1 month after discharge from intensive care was relatively low. Consistent with findings of previous research, being younger than 65 years was the only independent predictor of symptoms. (American Journal of Critical Care. 2008; 17:534-544)
The environment in intensive care units (ICUs) is typified by highly technological equipment, unfamiliar routines, noise, odors, and continuous lighting that may contribute to sensory overload. As a result, ICU patients may experience physical and emotional difficulties as they struggle to cope. Recognizing that the ICU experience may have long-term sequelae, recent reviewers have focused on patients’ ICU experiences and quality of life after discharge from the unit. However, less is known about specific psychological impacts of intensive care.

**Posttraumatic Stress Disorder**

PTSD is an anxiety disorder. Anxiety, which has existed throughout recorded history, is derived from the Greek root meaning “to press tight.” Generally considered a healthy adaptive response to stress, anxiety is experienced by all individuals during their life and follows fear, threat, danger, and/or the absence of an environment that signifies safety. Anxiety can be manifested by a range of physical reactions, such as palpitations (a cardiovascular indication), neuromuscular responses such as startle reactions, and gastrointestinal effects such as diarrhea. Anxiety disorders are among the most prevalent psychiatric disorders in the general population and are associated with inordinate morbidity, functional impairment, and an increased use of health care services. The prevalence of the disorders in the general population is estimated to be as high as 17.7%, and 1 in 4 persons meets the diagnostic criteria for an anxiety disorder. Anxiety-related conditions are a diverse array of disorders encompassing phobias, panic, obsessive-compulsive disorder, generalized anxiety, acute stress, dissociative disorder, and PTSD.

The evolution of PTSD can be traced back to as early as 1866, when a syndrome consisting of cognitive impairments and other psychosomatic signs and symptoms was identified in patients who had been in railway accidents. The disorder was labeled “railway spine” and is now regarded as the origin of modern psychotraumatology and PTSD. In the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision,* published in 2000, the criteria for diagnosis of PTSD are defined as (1) exposure to a traumatic event, with a response including fear, helplessness, or horror; (2) reexperiencing the event in a variety of subjective experiences that may include intrusive recollections of the event and psychological distress; (3) persistent avoidance of stimuli associated with the trauma accompanied by 3 or more of the following symptoms: avoidance of emotions and activities that arouse recollections of the event, memory impairment related to the event, diminished interests, detachment, restricted affect, and unrealistic perception of the future; and (4) increased level of arousal evidenced by symptoms that include sleep disturbance, startle response, emotional instability, hypervigilance, and difficulties in concentration. These criteria and symptoms are then classified as affecting a person by impairing the person’s level of function. PTSD is considered acute if symptoms persist for at least 1 month and is classified as chronic if symptoms persist longer than 3 months.

The lifetime prevalence of PTSD is estimated to be 8% in the general population, with rates of 10% to 12% in females and 5% to 6% in males. Various populations of hospitalized patients have been assessed for symptoms of PTSD. For example, about 6% of women experiencing childbirth, 8% to 45% of burn patients, and 20% to 28% of cardiac patients have symptoms consistent with PTSD.

The results of 15 recently published studies of PTSD in ICU patients suggest that some subpopulations may be at risk for the disorder (Table 1). Of the 15 studies, 6 (40%) were undertaken in the United Kingdom, 4 (27%) in the United States, 3 (20%) in Germany, and 2 (13%) in other European countries.
<table>
<thead>
<tr>
<th>Authors, year, country</th>
<th>Type of study, sample</th>
<th>Data collection</th>
<th>Findings and comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Schelling et al</strong>&lt;sup&gt;18&lt;/sup&gt; 1998 Germany</td>
<td>Retrospective study ICU ARDS cohort (n = 80) and 3 comparison groups: general population (n = 80), maxillofacial surgery patients (n = 75), and soldiers (n = 78)</td>
<td>Mailed survey that included: German Posttraumatic Stress Syndrome scale SF-36 Adverse Experiences in ICU Scale</td>
<td>22 (27.5%) of the ICU sample met the criteria for PTSD Remembering adverse experiences in the ICU was associated with PTSD symptoms Stressors identified included pain and anxiety Time frame from ICU discharge to survey was not reported</td>
</tr>
<tr>
<td><strong>Schnyder et al</strong>&lt;sup&gt;19&lt;/sup&gt; 2001 Switzerland</td>
<td>Prospective Cohort of critically ill accident patients assessed after ICU discharge but while in hospital (n = 121; 89.6% response rate)</td>
<td>In-person survey that included: IES Symptoms of PTSD Scale Social Network Index Inventory for Determining Life Events, Sense of Coherence Scale Freiburg Coping with Illness Scale</td>
<td>In the hospital, 5 patients (4.1%) met all criteria except time for PTSD, and 24 (19.9%) had subsyndromal PTSD Being female was weakly but significantly correlated with PTSD ($r^2 = 0.03, P &lt; .05$) Symptoms had to be present for at least 1 month to meet diagnostic criteria for PTSD</td>
</tr>
<tr>
<td><strong>Nelson et al</strong>&lt;sup&gt;20&lt;/sup&gt; 2000 United States</td>
<td>Retrospective study Cohort of lung injury patients 17-34 months after discharge (n = 24; 71% response rate)</td>
<td>Chart audit and mailed survey that included: APACHE III CES-D 7 item PTSD checklist</td>
<td>Deeper levels of sedation and neuromuscular blockade were associated with increased risk for PTSD</td>
</tr>
<tr>
<td><strong>Scragg et al</strong>&lt;sup&gt;21&lt;/sup&gt; 2001 United Kingdom</td>
<td>Retrospective study General adult ICU cohort of 86 patients (61% response rate), but only 77 (54%) had PTSD data</td>
<td>Mailed survey that included: IES Trauma Symptom Checklist-33 HADS Experience After Treatment in Intensive Care Scale</td>
<td>24 patients (31%) had medium or high levels of intrusion subscale scores 23 patients (30%) had medium or high levels of avoidance 12 patients (16%) had total scores that indicated severe psychological trauma Time frame from ICU discharge to survey was not reported</td>
</tr>
<tr>
<td><strong>Shaw et al</strong>&lt;sup&gt;22&lt;/sup&gt; 2001 United States</td>
<td>ARDS patients who received mechanical ventilation for 48 hours or more who underwent emergency intubation (n = 20; unsure of eligible sample)</td>
<td>In-person semistructured interviews with linguistic analysis and survey that included: IES Weinberger adjustment inventory</td>
<td>7 patients (35%) had clinical cutoff score for PTSD Significant correlations between scores on IES intrusion subscale and transcript content in the narratives (all $P &lt; .05$) Time frame from ICU discharge to survey was not reported</td>
</tr>
<tr>
<td><strong>Jones et al</strong>&lt;sup&gt;23&lt;/sup&gt; 2001 United Kingdom</td>
<td>Prospective study Cohort of patients who had an ICU LOS of &gt;24 hours and received mechanical ventilation (n = 45)</td>
<td>In-person and mail surveys at 4 and 8 weeks after ICU discharge that included: IES ICU Memory Tool HADS Fear Index</td>
<td>Patients who had no factual memory of the ICU but had delusional memories scored significantly higher than did other patients for PTSD symptoms At 8 weeks, trait anxiety and delusional memories without factual memory of ICU were predictive of PTSD symptoms 30 patients (67%) had paired assessments at 2 and 8 weeks</td>
</tr>
<tr>
<td><strong>Kress et al</strong>&lt;sup&gt;24&lt;/sup&gt; 2003 United States</td>
<td>Prospective study Comparison of general medical ICU patients at least 6 months after discharge (30% of eligible sample); control (n = 19), patients who had daily interruption in sedation (n = 13)</td>
<td>Structured interviews and self-report measures surveys that included: IES-R SF-36 State-Trait Anxiety Scale Beck Depression Inventory Psychosocial Adjustment to Illness</td>
<td>Presence of delusional memories increased the risk for PTSD Interruption in sedation decreased the risk for PTSD</td>
</tr>
<tr>
<td><strong>Cuthbertson et al</strong>&lt;sup&gt;25&lt;/sup&gt; 2004 United Kingdom</td>
<td>Prospective study General adult ICU cohort (n = 78; 70% response rate)</td>
<td>Telephone survey 3 months after ICU discharge that included: Davidson Trauma Scale Thoughts of death Interpretation of the seriousness of the injury</td>
<td>11 patients (14%) met full criteria for PTSD PTSD was inversely correlated with age No correlations were detected between PTSD and sex, ICU LOS, or APACHE II score</td>
</tr>
</tbody>
</table>

*continued*
<table>
<thead>
<tr>
<th>Author, year</th>
<th>Country</th>
<th>Type of study, sample</th>
<th>Data collection</th>
<th>Findings and comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capuzzo et al 2005</td>
<td>Italy</td>
<td>Prospective study General medical ICU patients who remained in ICU for &gt;3 days; n = 84 (84% response rate) at 1 week, n = 63 at 3 months</td>
<td>In-person semistructured interviews that included: ICU memory tool APACHE II SAPS II 14-item survey measuring recall of ICU IES</td>
<td>Rates of PTSD were low 5% of symptoms were associated with fewer factual memories 25% of the study sample was lost to follow-up at 3 months</td>
</tr>
<tr>
<td>Rattray et al 2005</td>
<td>United Kingdom</td>
<td>Prospective longitudinal study Emergency admissions to ICU; n = 87 at 6 months (80% response of 109 eligible sample); n = 80 at 12 months (73% response rate)</td>
<td>Structured interview in the hospital and at 6 and 12 months that included: IES HADS Intensive Care Experience Questionnaire</td>
<td>38 patients (62%) had moderate or severe symptoms of avoidance at 6 months; 41 (51%), at 12 months 47 patients (59%) had moderate or severe symptoms of avoidance at 6 months; 43 (54%) at 12 months Only 61 patients (70%) completed the IES at 6 months</td>
</tr>
<tr>
<td>Deja et al 2006</td>
<td>Germany</td>
<td>Retrospective study ICU ARDS cohort; 129 patients enrolled, 65 completed (50% response); mean, 32 months after ICU discharge</td>
<td>Semistructured interview that included: PDS Intensive Care Experience Questionnaire</td>
<td>PTSD was associated with anxiety in the ICU Perceived social support was related to a decrease in the risk for PTSD 29% of patients were at high risk for PTSD</td>
</tr>
<tr>
<td>Richter et al 2006</td>
<td>Germany</td>
<td>Prospective study Cohort of patients with prolonged ICU stay; comparison of trauma and other patients (n = 37; 64% loss to follow-up), mean 35 months after discharge</td>
<td>Semistructured psychiatric interview according to AMDR standards at 35 months after discharge; surgical ICU LOS &gt;30 days Survey included: Symptom Checklist-90-R</td>
<td>18 patients (49%) had psychiatric morbidity before admission PTSD was diagnosed in 7 patients (19%) 5 patients (14%) met 5 of the 6 criteria for PTSD (subdromal) 13 patients (35%) had avoidance and emotional numbing Trauma patients were at greater risk for PTSD than were nontrauma patients (P &lt; .02)</td>
</tr>
<tr>
<td>Jones et al 2007</td>
<td>United Kingdom</td>
<td>Prospective study Cohort ICU patients who received mechanical ventilation who remained in the ICU &gt;48 hours (n = 238; 42% of eligible sample)</td>
<td>Assessment of memories 1-2 weeks after discharge from ICU Semistructured telephone or in-person interview at 2 and 3 months after discharge from ICU that included: PTSS-14 PDS</td>
<td>PTSD ranged between 3.2% to 14.8%, suggesting that the level of care in the ICU has an impact on subsequent psychological illness</td>
</tr>
<tr>
<td>Sukantarat et al 2007</td>
<td>United Kingdom</td>
<td>Prospective study General ICU cohort who remained in the ICU for 72 hours or more, n = 51 at 3 months (unsure eligible sample); n = 45 at 9 months (12% loss to follow-up)</td>
<td>In-person survey at ICU follow-up clinics that included: HRQOL SF-36 PCS MCS HADS IES</td>
<td>Moderate correlations were detected between symptoms scores at 3 and 9 months and both intrusion and avoidance subscale scores 24% of patients reported intrusion at 3 months, and 36% reported avoidance No improvement in anxiety, depression, intrusion, or avoidance was detected at 9-month reassessment</td>
</tr>
<tr>
<td>Girard et al 2007</td>
<td>United States</td>
<td>Prospective study Medical and coronary ICU cohort who received mechanical ventilation (n = 43) Surveyed 6 months after discharge</td>
<td>In person survey that included: PTSS 10-Questions Inventory SFHS-12</td>
<td>14% of patients had PTSD 6 months after mechanical ventilation in ICU; rates in women were higher than rates in men Multivariable analysis of PTSD predictors showed higher rates in women than in men, and symptoms were less likely in older patients</td>
</tr>
</tbody>
</table>

Abbreviations: AMDR, Association for Methodology and Documentation in Psychiatry; APACHE, Acute Physiology and Chronic Health Evaluation; ARDS, adult respiratory distress syndrome; CES-D, Center for Epidemiological Studies-Depression; DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition, Text Revision); HADS, Hospital Anxiety and Depression Scale; HRQOL, health-related quality of life; ICU, intensive care unit; IES, Impact of Event Scale; IES-R, Impact of Event Scale-Revised; LOS, length of stay; MCS, Mental Component Summary; PCS, Physical and Mental Component Summary; PDS, Post-traumatic Stress Diagnostic Scale; PTSD, posttraumatic stress disorder; PTSS, posttraumatic stress syndrome; SAPS, Simplified Acute Physiologic Score; SF-36, Medical Outcome Short Form-36; SFHS, Short-Form Health Survey-12.
vent reduction in the quality of life in patients who have the disorder. Thus, understanding the scope of experience for ICU patients is important.

Purpose of the Study

The purpose of this study was to measure the frequency of acute PTSD symptoms in ICU patients and to determine if selected factors such as age, sex, severity of illness, length of stay (LOS), and type of admission are predictive of PTSD. If factors that influence the development of PTSD are identified, nurses and other health professionals may be able to either influence these factors or initiate early diagnostic testing and treatment for at-risk subgroups. We therefore sought to highlight the psychological needs of ICU patients and make recommendations for future clinical practice.

Methods

Conceptual Framework

The conceptual framework (Figure 1) predicted relationships between the development of PTSD symptoms and the following proposed factors: age (younger than 65 years vs 65 years or older), sex, severity of illness, type of admission (elective vs emergency), and ICU and hospital LOS. As previously determined, in the general population the risk of PTSD after exposure to a traumatic event is twice as high in women as in men. In addition, severity of illness as indicated by scores on the Acute Physiology and Chronic Health Evaluation (APACHE) II may be related to development of PTSD symptoms.

Plausibly, patients who have a planned ICU admission may have more time to prepare for the experience than do patients who have emergency admissions. LOS may be an indicator of the attachment and dependence a patient develops with a nurse as a result of a life-threatening event and 1 to 1 care. Further, discontinuing use of the technology and equipment that surrounds a patient in the ICU can be anxiety provoking. Subsequent transfers from the ICU may contribute to anxiety because of the loss of close surveillance by staff and of a high level of technical monitoring. Thus, previous research and logical reasoning supported the 6 predictors. The research questions were as follows:

• What is the frequency of acute PTSD symptoms in ICU patients 1 month after ICU discharge?
• To what extent are patients’ characteristics (age, sex, type of admission, severity of illness, and ICU and hospital LOS) predictive of PTSD symptoms in ICU patients 1 month after ICU discharge?

None were undertaken in Australasia. Sample sizes ranged from 20 to 238 participants, with a median of 78. A total of 12 studies (80%) had fewer than 100 participants, even though complex multivariate analysis was used in many of the investigations. The time from ICU discharge to measurement of PTSD symptoms varied widely.

In one study, symptoms were measured while patients were in the hospital; in other studies, symptoms were assessed within 3 to 9 months after ICU admission. In still others, the time from ICU discharge to measurement was not specified or the time between discharge and measurement was not standardized. A range of data collection methods were used, such as mailed surveys and face-to-face interviews. A variety of instruments were used to measure PTSD; the Impact of Event Scale (IES) was used most often. Reported frequencies of PTSD symptoms varied from 4% to 35%; the differences may be related to variations in the time elapsed between ICU discharge and measurement. Factors associated with PTSD included being younger, being female, experiencing a traumatic injury, receiving increased sedation in the ICU, remembering adverse experiences while in the ICU, remembering experiences of anxiety that occurred in an ICU, and having delusional or less factual memories.

In summary, research findings to date suggest that PTSD symptoms may be associated with the ICU experience. Untreated PTSD is disabling, and firm recommendations exist for early treatment to preven...
Design and Sample

A predictive cohort study was used. The setting was Gold Coast Hospital, a 580-bed tertiary referral acute health care facility in Queensland, Australia, with a 13-bed adult ICU. The ICU provides services to medical, surgical, and trauma patients and averages 750 to 850 admissions per year. Ethical approval for the study was obtained from Griffith University Human Research Ethics Committee and the Gold Coast Health Services District Ethics Committee. Patients were eligible for the study if they were older than 18 years; had an ICU stay of at least 24 hours (to ensure a sufficient duration of time spent in the environment); could speak, read, and write English; and had no reported history of anxiety disorder, as documented in medical records. Participants were also asked if they had an anxiety disorder. Patients were excluded from the study if they were transferred from the ICU because death was expected (in order to be sensitive to the patient’s and family’s situation); were to be discharged directly to home or another health care facility (because of difficulties tracking the patient); or were in a confused state (these patients would be unable to give informed consent to participate in the study).

Data Collection

During their ICU stay, patients were assessed for eligibility; if eligible, at the time of transfer to the step-down or intermediate care unit they were approached and invited to participate in the study. Participants were given an information summary and signed a consent form. Data were collected from 2 sources: (1) an electronic patient database, the Australian Outcomes Research Tool for Intensive Care (AORTIC) database, which was used to collect data on the predictors; and (2) a survey that consisted of the IES-Revised (IES-R), the dependent variable. AORTIC database information was electronically transferred to the researcher’s database.

Approximately 1 month after discharge from the ICU, patients who had been discharged from the hospital who agreed to participate in the study were contacted by telephone to conduct the survey. Verbal consent was obtained before the survey was administered. A few participants contacted by telephone requested that the survey be mailed to them. For patients who remained hospitalized, the survey was administered in person. Before the interview began, patients were asked to confirm that they had no history of an anxiety disorder.

Instruments

The IES-R is a self-report instrument used to assess the psychological consequences of exposure to a traumatic event. It is the most widely used validated measure of PTSD symptoms. General consensus on the tool’s accuracy and reliability is based on the correlations between IES-R scores and other measures of PTSD. In a factor analysis, the IES-R subscales were supported and had reasonably strong item-total correlations.

The IES-R contains 22 items grouped into 3 subscales. The first subscale is related to symptoms of intrusion (7 items), characterized by unwanted thoughts and images and disturbed sleep. The second subscale, avoidance (8 items), focuses on denial of the meanings and consequences of the event, blunted sensation, and awareness of emotional numbness. The final subscale, hyperarousal (7 items), includes sleep disturbance, flashback symptoms, and emotional lability. Responses are scored on a 5-point Likert scale: 0, not at all; 1, a little bit; 2, moderately; 3, quite a bit; and 4, extremely. The IES-R is brief and easy to administer. The assessment period is the preceding 7 days. Completion time is 5 to 15 minutes. The total score is the sum of the scores of all items; scores of 33 or greater indicate clinical PTSD.

Other demographic and clinical data, including APACHE II scores as a measure of severity of illness, were collected from the AORTIC database. Scores on the APACHE II range from 0 to 71. The AORTIC database is maintained by a full-time data manager who was responsible for data collection and database entry and was independent of the research team. The quality control measures used for the database included visual checks of the data and monthly audits. The data accessed from this database included age, sex, type of admission, diagnosis, APACHE II score, and ICU and hospital LOS.

Data Analysis

All data from the surveys were analyzed by using SPSS software, version 12 (SPSS Inc, Chicago, Illinois). Accuracy of the data entered was confirmed by double entry of all data. The Cronbach’s α was used to indicate the reliability of the IES-R in this study. Initial analysis of descriptive data (frequency, mean, standard deviation, median, interquartile range) was undertaken for all variables. Mann-Whitney and χ² tests were used to detect differences in demographic characteristics between men and women.

In this study, 13% of participants had acute PTSD symptoms 1 month after ICU discharge.

Those less than 65 years of age were 5.6 times more likely than those above 65 to report PTSD symptoms.
Demographic characteristics of the sample are shown in Table 2. Participants were 18 to 89 years old (mean, 63; SD, 18.9), with no significant differences in age between men and women. As expected, 68% of the participants were men and 32% were women, consistent with the sex distribution of the ICU population. APACHE II scores ranged from 2 to 40 (median, 13.0), with no significant differences between men and women. No participants had experienced a motor vehicle accident. The median ICU LOS was 2.4 days (range, 1-31). A total of 40% of participants stayed between 1 and 2 days. The median hospital LOS was 2.4 days (range, 1-31). Differences between men and women for either ICU or hospital LOS were not significant. In total, 33 participants received ventilatory support. Of these participants, 23 (70%) were men, and 10 (30%) were women. Differences in the proportion of men and women who received ventilatory support were not significant.

The Cronbach α for the total IES-R scale was high at 0.95, and for each subscale it was between 0.66 and 0.80 (Table 3). The hyperarousal subscale had the lowest reliability coefficient. The overall mean IES-R was 17.8 (SD, 13.4) out of a possible total score of 88. Apparently, participants had few symptoms of PTSD. The clinical cutoff point of the IES-R was 33 and provides the best diagnostic accuracy for PTSD. A total of 13 participants (13%) had the cutoff score or higher, indicative of PTSD. These 13 patients were referred to a general practitioner or counseling (as per human research ethics requirements).

Univariate and multivariate logistic regressions were used to determine the predictors of acute PTSD symptoms (ie, IES-R score ≥33). Potential predictors entered into the regression analysis were age, sex, type of admission, APACHE II score, and ICU and hospital LOS.

Results

During the 9 months of the study, 765 patients were admitted to the ICU. Of these, 137 were eligible to participate in the study, 114 consented to participate, and 88% (100/114) completed the survey (Figure 2).

Discussion

The ICU presents a paradoxical concept of caring. The life-saving technology used in the environment also means unpleasant noise levels, bright lights, and invasive and painful procedures for patients. The evaluation of the frequency of PTSD symptoms in ICU survivors originates from speculation that patients may not recover psychologically even though they have recovered physically. Research suggests that critical illness is a stressor and that the potential for PTSD exists. Untreated PTSD can result in significant psychosocial deficits for patients, loss of...
years, a situation that may have significant consequences for the persons affected. Other investigators also found that younger age was associated with PTSD. Why PTSD may develop in younger persons is open to speculation. Because the disorder is associated with the development of other psychological conditions, and because up to one-third of persons with untreated PTSD do not recover, health professionals should be aware of the evidence linking PTSD with younger age. Follow-up care provides the opportunity to assess a patient’s physical and psychological needs. PTSD symptoms include reexperiencing the trauma, avoidance of the stimuli associated with the trauma, and a numbing of general responsiveness and increased levels of arousal. Numerous studies have indicated that patients with PTSD are at increased risk for many other psychiatric disorders. Comorbid disorders or the co-occurrence of more than a single diagnosable disorder is also well recognized in patients with untreated PTSD. Survival analysis of patients with PTSD shows that more than one-third of those with the disorder do not recover if untreated. Thus, employment, and an economic burden on both patients and their families. Although admission to an ICU can be an emergency circumstance, admissions can also be prearranged.

The frequency of PTSD symptoms in our study sample 1 month after discharge from the ICU was relatively low at 13%, but higher than the prevalence of PTSD in the general population, estimated at 8%. However, we do not know how many of the patients who had PTSD symptoms had the symptoms before admission to the ICU. The low frequency of PTSD symptoms may be due to the quality of nursing care provided to the patients in our ICU. For example, a patient and family information booklet is used, the unit has an ICU Liaison nurse, and a formal process exists for preparing patients and families for discharge from the unit. Apparently, these care management strategies support patients’ psychological recovery. Other researchers have reported PTSD symptoms in 5% to 62% of ICU patients. This wide variation may be related to the variety of variables examined and differences in study methods. A recent systematic review of the literature on PTSD and the ICU has indicated the need for consistency in definitions and time related to PTSD research to allow for comparisons of research findings.

The type of admission to an ICU may affect a patient’s control in accommodating the event. In 2004, about a quarter of admissions to the study site ICU were planned. Patients who are psychologically prepared may be protected from the risk of developing PTSD symptoms. In our small sample, type of admission (elective vs emergency) was not predictive of acute PTSD symptoms; however, it might have been in a larger sample. Others have found an association between emergency admission and PTSD symptoms. Other than age, the potential predictors in our conceptual framework were not predictive of PTSD symptoms. This finding is somewhat surprising because sex has been predictive of PTSD.

In our study, rates of PTSD symptoms were higher in younger patients. Importantly, PTSD may be affecting people at the peak of their productive work years, a situation that may have significant consequences for the persons affected. Other investigators also found that younger age was associated with PTSD. Why PTSD may develop in younger persons is open to speculation. Because the disorder is associated with the development of other psychological conditions, and because up to one-third of persons with untreated PTSD do not recover, health professionals should be aware of the evidence linking PTSD with younger age. Follow-up care provides the opportunity to assess a patient’s physical and psychological needs. PTSD symptoms include reexperiencing the trauma, avoidance of the stimuli associated with the trauma, and a numbing of general responsiveness and increased levels of arousal. Numerous studies have indicated that patients with PTSD are at increased risk for many other psychiatric disorders. Comorbid disorders or the co-occurrence of more than a single diagnosable disorder is also well recognized in patients with untreated PTSD. Survival analysis of patients with PTSD shows that more than one-third of those with the disorder do not recover if untreated. Thus,

### Table 3

<table>
<thead>
<tr>
<th>Scale</th>
<th>Reliability</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
<th>Maximum score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoidance (range, 0–32)</td>
<td>0.80</td>
<td>5.8 (5.5)</td>
<td>4.0 (6.0)</td>
<td>23</td>
</tr>
<tr>
<td>Hyperarousal (range, 0–28)</td>
<td>0.66</td>
<td>5.6 (4.4)</td>
<td>5.0 (6.0)</td>
<td>17</td>
</tr>
<tr>
<td>Intrusion (range, 0–28)</td>
<td>0.79</td>
<td>6.5 (4.8)</td>
<td>6.0 (6.0)</td>
<td>24</td>
</tr>
<tr>
<td>Total summed scale (range, 0–88)</td>
<td>0.95</td>
<td>17.8 (13.4)</td>
<td>15.0 (16.8)</td>
<td>62</td>
</tr>
</tbody>
</table>

Abbreviation: IQR, interquartile range.

* Minimum score for each scale was zero.

### Table 4

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Odds ratio (95% confidence interval)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Univariate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &lt; 65 years</td>
<td>5.63 (1.17-26.89)</td>
<td>.03</td>
</tr>
<tr>
<td>Sex (male)</td>
<td>1.39 (0.42-4.64)</td>
<td>.59</td>
</tr>
<tr>
<td>Acute Physiology and Chronic Health Evaluation II score</td>
<td>0.87 (0.77-0.98)</td>
<td>.02</td>
</tr>
<tr>
<td>Intensive care unit length of stay</td>
<td>0.99 (0.98-1.01)</td>
<td>.20</td>
</tr>
<tr>
<td>Emergency admission</td>
<td>0.94 (0.24-3.75)</td>
<td>.93</td>
</tr>
<tr>
<td>Hospital length of stay</td>
<td>0.79 (0.54-1.14)</td>
<td>.20</td>
</tr>
<tr>
<td>Multivariate</td>
<td>5.63 (1.17-26.89)</td>
<td>.03</td>
</tr>
</tbody>
</table>
Monitoring psychological outcomes for ICU patients may be as important as their physical recovery.

PTSD may be affecting people at the peak of their productive work years, which may have significant consequences for the individual. Once the validity of the IES-R was established, the psychiatric interviews would no longer be required, eliminating the high cost of continuing to use 2 measures. Rates of PTSD may be underestimated if the sample size is small, as in our study. Because it took 9 months to recruit the sample, larger multisite studies are indicated for future research. In addition, our sample size of 100 may have lacked the power to detect a difference in the frequencies of PTSD symptoms between men and women. A post hoc power analysis indicated that a sample of about 500 would have been required to detect a statistical difference between men and women. With a larger sample, more independent predictors of PTSD might have been detected. Additionally, some of the patients who declined to participate in our study may actually have been demonstrating the PTSD symptom of avoidance; thus, the frequency might have been underestimated. Further, acute PTSD symptoms were measured at a single study site. A longitudinal multisite study would allow measurement of both acute and chronic PTSD symptoms. Finally, an ICU liaison nurse and a structured discharge plan were part of standard practice in our study site. The extent to which these interventions influenced the development of PTSD symptoms is unknown, but may be worth further investigation.

Conclusion

The symptoms of acute PTSD were measured in 100 participants 1 month after discharge from the ICU. Participants younger than 65 years were 5.6 times more likely than those 65 years and older to score above the IES-R cutoff score for clinical PTSD. This study has provided preliminary Australian data on psychological outcomes after an ICU stay. As critical care nursing continues to develop, more independent nursing interventions are being designed to improve patients’ outcomes. Understanding the frequency of PTSD symptoms provides a strong foundation on which critical care nurses can continue to develop and advance their practice.

ACKNOWLEDGMENTS

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FINANCIAL DISCLOSURES

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1. Which of the following statements is true regarding posttraumatic stress disorder (PTSD) in the general population?
   a. PTSD is considered a major depressive disorder.
   b. Individuals diagnosed with PTSD use fewer health care resources compared with the general population.
   c. The lifetime prevalence of PTSD is estimated to be approximately 8%.
   d. Men exhibit twice the prevalence of PTSD compared with women.

2. Which of the following is not considered a diagnostic criterion for PTSD?
   a. Increased level of sleep disturbance, startle response, and emotional instability
   b. Experiencing the original trauma
   c. Persistent avoidance of stimuli associated with the trauma
   d. Symptoms begin commonly in middle age with no relationship to a traumatic event

3. Which of the following is a common physiologic reaction to anxiety as described by the authors?
   a. Palpitations
   b. Constipation
   c. Increased somnolence
   d. Diminished reflexes

4. Acute PTSD is classified as which of the following?
   a. Symptoms persisting at least 1 week
   b. Symptoms persisting for more than 3 months
   c. Symptoms persisting for at least 1 month
   d. Symptoms persisting immediately following the triggering traumatic event

5. Which of the following patients would most likely have been included as a study participant?
   a. 15-year-old male admitted after a motor vehicle collision with a closed head injury
   b. 88-year-old confused female with an intracerebral hemorrhage transferred to the neuro unit for palliative care
   c. 63-year-old male after emergency surgical admission with an ICU stay of 48 hours
   d. 44-year-old female with peritonitis and a known anxiety disorder

6. Previous research on PTSD in the post-ICU admission period has shown rates from 5% to 64%. What do the authors suggest may be responsible for this wide variation in previous findings?
   a. Higher acuity and Acute Physiology and Chronic Health Evaluation scores of participants
   b. Variety of variables examined and differences in study methods
   c. Demographic characteristics of study participants
   d. Differences in support systems within the individual units

7. Which of the following statements is true regarding the treatment of PTSD?
   a. Patients with untreated PTSD are at decreased risk for the development of other psychiatric disorders.
   b. Early recognition and treatment can prevent decrease of quality of life in those with PTSD.
   c. Patients with PTSD are highly likely to recover without any treatment.
   d. Very few treatment modalities exist to address this debilitating diagnosis.

8. Which of the following statements is true regarding the prevalence of PTSD in the study participants?
   a. Study participants were more likely to experience acute PTSD than the general population.
   b. Study participants were less likely than the general population to experience acute PTSD.
   c. Study participants were no more likely than the general population to experience acute PTSD.
   d. Study participants were more likely than the general population to experience chronic PTSD.

9. Which of the following is true regarding the relationship of age to findings in the study participants?
   a. Participants older than 65 years were 10.3 times more likely to score above the Impact of Event Scale – Revised (IES-R) cutoff score for PTSD compared with patients younger than 65 years of age.
   b. Participants younger than 65 years were 5.6 times more likely to score above the IES-R cutoff score for PTSD compared with patients older than 65 years.
   c. Participants older than 85 years were more likely to score above the IES-R cutoff score for PTSD compared with all other age groups.
   d. Participants younger than 18 years were 5.6 times more likely to score above the IES-R cutoff score for PTSD compared with older patients.

10. The IES-R is used for the interview conducted by the researchers in this study. Which of the following is not a subscale used in this tool?
    a. Intrusion
    b. Avoidance
    c. Physiologic manifestations
    d. Hyperarousal

11. Which of the following were described as study limitations by the authors?
    a. Sample size
    b. Demographic criteria
    c. Multisite design of the study
    d. Failure to include pediatric patients in the study

12. Which of the following means of data collection was used for most participants in this study?
    a. In-hospital interview
    b. Surveys distributed and returned by mail
    c. Phone interview
    d. At-home in-person interview

13. Which of the following is not described as a treatment modality for PTSD?
    a. Pharmacotherapy, including antidepressants and antianxiety agents
    b. Support to decrease emotional display
    c. Support to develop coping strategies
    d. Normalizing symptoms

Test ID: A0817063 Contact hours: 1.0 Form expires: November 1, 2010. Test Answers: Mark only one box for your answer to each question. You may photocopy this form.

1. a 2. a 3. a 4. a 5. a 6. a 7. a 8. a 9. a 10. a 11. a 12. a 13. a
   b b b b d c c c d d d d d d

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