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Critical Clinical Events and Resilience Among Emergency Nurses in 3 Trauma Hospital-Based Emergency Departments: A Cross-Sectional Study

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Contribution to Emergency Nursing Practice

- Emergency nurses are exposed to numerous critical (stressful) clinical events in the workplace.
- Providing care to a sexually abused child, experiencing the death of a coworker, and lack of responsiveness by a colleague during a serious situation were considered the most stressful critical clinical events by emergency nurses, while the least stress-provoking event was incidents with excessive media coverage.
- Emergency nurses should be educated on work-related stress, its impact on their health, sentinel events and tipping points in relation to stress symptoms, and effective strategies to promote resilience.

Abstract

Introduction: Emergency nurses experience occupational stressors resulting from exposures to critical clinical events. The purpose of this study was to identify the critical clinical events for emergency nurses serving 3 patient populations (general, adult, pediatric) and whether the resilience of these nurses differed by the patient population served.

Methods: This study used a cross-sectional survey design. A total of 48 emergency nurses were recruited from 3 trauma hospital-based emergency departments (general, adult, pediatric). Clinical Events Questionnaire, Connor-Davidson Resilience scale, and an investigator-developed demographic questionnaire were used to collect data from respondents.

Results: All respondents were female (n = 48, 100%), and most were White (n = 46, 96%). The average age of participants was 39.6 years, the average number of years as a registered nurse was 12.7 years, and the average number of years as an emergency nurse was 8.8 years. Clinical events considered most critical were providing care to a sexually abused child, experiencing the death of a coworker, and lack of responsiveness by a colleague during a serious situation. The least stress-provoking event was incidents with excessive media coverage. Nurses were less affected by the critical events they experienced more frequently at work. Nurses in the 3 trauma settings had high level of resilience, with no statistically significant differences between groups.

Discussion: The occupational stress from exposure to significant clinical events varied with the patient population served by emergency nurses. It is important that interventions be adopted to alleviate the effect of work-related stressors and promote the psychological health of emergency nurses.

Key words: Critical clinical event; Emergency department; Emergency nurse; Resilience; Stress

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Introduction

Emergency nurses are exposed to a steady stream of critical clinical events as part of their normal nursing practice. Critical clinical events are those patient care situations that

evoke extreme distress in nurses.[1] Examples of critical clinical events include witnessing a death, seeing the impact of physical or sexual abuse of a child, simultaneous treatment of severely injured patients, and being physically assaulted during the course of patient care.[2,3]

BACKGROUND

The National Institute for Occupational Safety and Health[4] defines work-related stress as any adverse physical or psychological reaction to overwhelming job requirements that exceeds the capabilities of the worker to adapt. Nursing is a highly demanding profession, and nurses are subject to a wide variety of work-related stressors. Emergency nurses, in particular, experience high levels of work-related stress as they face numerous critical clinical events during their daily work. In previous studies on occupational stress in emergency departments, emergency nurses reported exposure to different types of clinical stressors during their work. Heavy workload, sexual abuse or death of a child, workplace violence, providing critical care for a family member or friend, and inability to provide quality care were rated as the most stressful events in the workplace by emergency nurses.[2,3,5]

According to the American Psychological Association,[6] chronic exposure to work-related stress has negative effects on individuals' mental and physical well-being and can contribute to health conditions such as heart disease, immune problems, anxiety, and depression. Maladaptive strategies to occupational stress such as overeating or drinking alcohol can complicate stress effects further.[6] Work-related stress also decreases workers' productivity and job performance and affects job satisfaction. The findings of research with emergency nurse samples showed that stress at work is related to decreased job performance,[7] burnout,[8] intention to leave,[9] and compassion fatigue.[10]

Work-related stress cannot be totally avoided for nurses working in emergency departments. Therefore, it is crucial for emergency nurses to develop resilience through adopting effective coping strategies. Examples of effective coping strategies adopted by emergency nurses are using self-control of emotions and responses to stressors, positive reappraisal,[11] asking for advice from others, and focusing on the benefits of a negative or challenging situation.[12] Despite the use of effective coping strategies to promote resilience in emergency nurses, several personal and work-related factors were found to influence resilience in ED health care workers. Being married, having more years of professional experience, and working night shift are associated with greater resilience.[13]

CONCEPTUAL FRAMEWORK

The framework for this study was the Cognitive Activation Theory of Stress developed by Ursin and Eriksen.[14] This theory describes the relationships between life stressors, an individual's responses to stressors, and the consequences on the individual's health. There are 4 key assumptions for the Cognitive Activation Theory of Stress: (1) there must be an event or situation with the potential to cause someone stress, (2) the stressor must be experienced, (3) the person will experience a state of heightened arousal, and (4) the person will experience a reaction to the stressor.[14] The following background is organized based on the 4 assumptions.

STRESS SITUATIONS

Several events or situations are linked to stress in nurses. Specific nursing situations include providing disaster management and relief,[15] experiencing workplace violence,[2,3] seeing patients die,[3] and providing trauma care.[16] In addition, specific personal events (eg, illness of a loved one) are stress provoking factors for nurses.[17]

STRESS EXPERIENCE AND AROUSAL

Duffy et al[18] measured the prevalence of secondary traumatic stress among a sample of emergency nurses. The authors evaluated the participants based on the frequency of symptoms related to secondary traumatic stress (intrusion, avoidance, and arousal). They found that most (64%) respondents met the diagnostic criteria for secondary traumatic stress based on the symptoms reported.

STRESS REACTION

Richardson explained that effective coping strategies promote resilience,[19] which is the ability of a person to thrive during stressful situations.[20] Several demographic, personal, and lifestyle factors influence an individual's resilience.[21,22] Studies with emergency nurses show that nurses use different types of coping mechanisms to manage workplace stress and promote resilience.[11,12]

SCIENTIFIC GAP

The literature reflects that there are likely multiple clinical events perceived as "critical." Due to the nature of the ED environment, several critical clinical events are not totally avoidable such as experiencing sudden patient death or

dealing with multiple clinical events at the same time. Therefore, one of the logical next steps in reducing the potential negative impact of critical clinical events on emergency nurses is to identify those clinical events perceived as most critical (or distressing). It is not known whether critical clinical events experienced by emergency nurses vary by patient population served; therefore, research needs to be conducted exploring this difference.

Resilience is an important indicator of an individual's ability to cope with stressors. Several studies addressed the effect of emergency nurses' demographic characteristics on their resilience. However, there is a need for studies that investigate the effects of different work-related factors such as the type of patient population served on emergency nurse resilience. The purpose of this study was to identify critical clinical events for emergency nurses serving 3 patient populations (general, adult, pediatric) and whether the resilience of these emergency nurses differs by the patient population served.

Methods

STUDY DESIGN

This study was conducted using a secondary data analysis of cross-sectional data collected in a previous study. Based on the scientific gap, the following research questions were answered:

1. What are the prevailing critical clinical events in a sample of emergency nurses based on the patient population served?
2. Does emergency nurse resilience differ by the patient population served?

The reporting of this study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines tailored for cross-sectional studies.[23]

SETTINGS AND SAMPLE

A total of 48 participants in the original study were recruited from 3 trauma hospital-based emergency departments: urban general teaching hospital providing care to both adults and pediatric patients, suburban adult teaching hospital, and urban pediatric teaching hospital. From each site, 16 emergency nurses participated in the study; respondents worked in only 1 study site (no overlap with employment). In the year preceding the original study, the numbers of trauma team activations were 2900 in the general trauma center, 456 in the adult trauma center, and 306 in the pediatric trauma center. Each site had an interprofessional trauma team that responded when activated. Trauma team members were composed of emergency nurses, emergency physician, trauma resident, trauma surgeon, and support personnel such as paramedic, radiology technician, and laboratory technician.

Participant recruitment occurred between December 2009 and April 2010. The original study used a qualitative design with focus group interviews with emergency nurses on the stressors they experienced in the work environment. The respondents were asked to complete cross-sectional surveys before starting the focus group interviews to stimulate their thoughts regarding the stressors they encounter in the workplace. A total of 48 participants responded to the study invitation. Inclusion criteria were being employed full or part time, having an unrestricted registered nurse licensure, and providing emergency care. Exclusion criteria were managers or other direct supervisors who evaluate the performance of the potential respondents. Convenience sampling was used to recruit respondents.

A post hoc power analysis was computed based on the parameters of the variable with the most significant difference between groups (violence, including verbal abuse, threats, and physical abuse by one member of staff toward another). Based on effect size 0.251, alpha 0.05, sample size of 48, and 4 covariates, achieved power was 30.3%. In order to achieve an optimal minimum power of 80% with effect size 0.251 with 3 groups and 4 covariates, a minimum sample size of 157 is recommended for a future replication study within a population similar to this study.

HUMAN SUBJECTS PROTECTIONS

Approval was granted by the university and 3 hospital Institutional Review Boards. Respondents were informed that participation was voluntary and not a condition of their employment. Signed written consent was obtained from all participants.

VARIABLES AND INSTRUMENTS

Clinical Events

Clinical events were measured using the Clinical Events Questionnaire (CEQ).[1] The CEQ is a 29-item instrument used to measure perceived stress of different clinical events using a 5-point Likert scale ranging from 0 to 4. Higher scores reflect greater negative perception of the clinical events. Using factor analysis, O'Connor and Jeavons[1]

determined that the questionnaire's 3 subscales accounted for 51.5% of the variance. Internal consistency reliability for the subscales was 0.90 (grief), 0.92 (emergency), and 0.81 (risk).

Resilience

Resilience was measured using the Connor-Davidson Resilience scale (CD-RISC).[24] Responses were provided using a 5-point Likert scale ranging from 0 to 4. The total score ranges between 0 and 100, where higher scores indicate greater resilience. CD-RISC exhibited evidence of reliability through internal consistency reliability (Cronbach's alpha = 0.89) and test-retest reliability (intraclass correlation coefficient = 0.87). Moreover, the CD-RISC demonstrated validity using factor analysis, convergent validity, and discriminant validity.[24]

Patient Population Served and Respondent Characteristics

Patient population served was determined by the site of the emergency department in which respondents completed their survey packet. Survey packets were color-coded to ensure that data were correctly attributed to their respective group (general, adult, pediatric). Respondents also completed an investigator-developed demographic and work characteristics questionnaire. Survey items solicited respondents about their personal demographic and work characteristics. Demographic characteristics were age, gender, race, ethnicity, educational attainment, years of experience as a registered nurse, and years of experience as an emergency nurse. Work characteristics were shift worked, average number hours worked per week, and whether formal training was received by current employer on how to cope with stressful patient situations.

PROCEDURES

Respondents were recruited through mailbox invitations and presentations at department meetings. Potential respondents communicated with a site facilitator to participate and came to a scheduled focus group session. At the start of each research session, respondents read and signed the study consent form and were given a paper copy of the survey packet used for the current report. All enrolled respondents (n = 48) completed the study procedures. Data were collected anonymously. Data then were entered into an electronic database by 2 graduate assistants. Data entry reliability was confirmed before data analysis.

DATA ANALYSIS

Descriptive statistics (eg, frequencies, percentages) were used to describe the characteristics of the study sample. Analysis of variance and Fisher exact test were used to test whether there were significant differences in the demographic and work characteristics between the 3 groups based on the patient population served (general, adult, pediatric). A mean score across participants was generated for each item in CEQ. Items were rank-ordered from highest mean score to lowest mean score. The total CD-RISC score for each respondent was calculated. Analysis of covariance (ANCOVA) was used to compare mean scores for leading critical clinical events and CD-RISC scores based on patient population served. Covariates were based on those demographic and work characteristic variables identified to have statistically significant differences between patient population served. Tukey post hoc analyses along with 95% confidence intervals were conducted for items demonstrating statistical analysis from ANCOVA. Alpha was set at 0.05. Analyses were completed using SPSS Statistics 27 (IBM Corp). Figures were created using RStudio.

Results

All participants were female (n = 48, 100%), and most were White (n = 46 of 48, 96%) and non-Hispanic (n = 40 of 41, 98%). The mean age of participants was 39.6 years (range 24-62 years). The mean number of years as a registered nurse was 12.7 (range 1-42 years), and the mean number of years as an emergency nurse was 8.8 (range 1-28 years). There were significant differences in age ($F[2,45] = 8.929$, $P < .001$), years of RN experience ($F[2,45] = 9.076$, $P < .001$), years of ED experience ($F[2,45] = 7.830$, $P = .001$), and shift worked (Fisher exact $P < .001$) between the sample groups based on patient population served (general, adult, pediatric). No significant differences were found for the remaining demographic characteristics when compared based on patient population served (see Table 1).

Clinical events that were perceived as most stressful were providing care to a sexually abused child (M = 3.50, SD = 0.68), observing the death of a coworker (M = 3.48, SD = 0.88), and the lack of responsiveness by a health care professional during a serious situation (M = 3.19, SD = 0.73) (see Table 2). The least stress provoking events were dealing with incidents with excessive media coverage (M = 1.48, SD = 1.07), unusual situations involving patients without death (M = 1.54, SD = 0.85), and emergency situations such as cardiac or respiratory arrest (M = 1.85, SD = 1.03) (see Table 2).

TABLE 1
Demographic and work characteristics of the study respondents (n = 48)

Characteristic	All respondents			Patient population served									F statistic	*P* value*
				General			Adult			Pediatric				
	Mean	N	%	Mean	N	%	Mean	N	%	Mean	N	%		
Age (y)	39.6			37.2			47.1			34.5			8.93	< .001
Years as registered nurse	12.7			9.7			20.3			8.2			9.08	< .001
Years as emergency nurse	8.8			7.2			13.4			5.8			7.83	.001
Hours worked per week	37.9			39.3			37.4			37.1			0.28	.76
Educational attainment														.62
Diploma		7	14.6		1	6.3		2	12.5		4	25.0		
Associate degree		18	37.5		6	37.5		7	43.8		5	31.3		
Bachelor's degree		19	39.6		7	43.8		5	31.3		7	43.8		
Master's degree		4	8.3		2	12.5		2	12.5		0	0		
Shift worked														< .001
Day shift		32	66.7		16	100		7	43.8		9	56.3		
Evening shift		6	12.5		0	0		1	6.3		5	31.3		
Night shift		10	20.8		0	0		8	50.0		2	12.5		
Received training to cope with stressful situations		31	64.6		11	68.8		11	68.8		9	56.3		.80

* ANOVA computed for ratio variables; Fisher exact test computed for categorical variables.

Several group comparisons reflected significant group differences based on patient population served; for example, violence, including verbal abuse, threats, and physical abuse by one member of staff toward another ($F[2,41] = 6.533$, $P = .003$), death of a patient after prolonged resuscitation ($F[2,41] = 5.707$, $P = .007$), multiple trauma with massive bleeding or dismemberment ($F[2,41] = 5.370$, $P = .008$), unexpected patient death ($F[2,41] = 5.344$, $P = .009$), emergency situation (eg, cardiac arrest or respiratory arrest) ($F[2,41] = 5.023$, $P = .011$), caring for severely burned patient ($F[2,41] = 4.226$, $P = .021$), and providing care to a coworker's family member who is dying or in a serious condition ($F[2,41] = 3.317$, $P = .046$). Figures 1-7 display boxplot graphs for stressors with significant differences between the 3 emergency nurse groups.

The results of post hoc analysis showed that emergency nurses who provide care for pediatric patients rated multiple stressors significantly higher than emergency nurses caring for general or adult populations. Emergency nurses who served pediatric patients perceived violence, including verbal abuse, threats, and physical abuse by one member of staff toward another as a stressor ($M = 3.06$) significantly higher than emergency nurses who served adult patient population ($M = 2.19$, $P = .020$). Likewise, emergency nurses providing care to pediatric patients rated the death of a patient after prolonged resuscitation ($M = 3.00$) higher than emergency nurses who served adult patient population ($M = 1.75$, $P = .002$) and emergency nurses who served general patient population ($M = 1.94$, $P = .011$). Moreover, emergency nurses who served pediatric patients perceived multiple trauma with massive bleeding or dismemberment as a stressor ($M = 2.88$) significantly higher than emergency nurses who served adult patient populations ($M = 1.69$, $P = .002$) and emergency nurses providing care for general populations ($M = 2.00$, $P = .029$). The remaining significant differences between groups are presented in Table 3. Interestingly, despite ANCOVA results that indicated significant differences between the 3 groups for the stressor caring for severely injured patient, post hoc analysis results revealed no significant differences between the groups. Figure 6 displays a boxplot graph visualizing the responses to this critical clinical event.

TABLE 2

Clinical events ranked based on perceptions as being critical (most stressful) based on mean score and compared by patient population served while controlling for respondent age, years of registered nurse experience, years of emergency nursing experience, and shift worked

Clinical event (stressor)	All respondents		Patient population served							
			G		A		P		F statistic*	*P* value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Sexual abuse of a child	3.50	0.68	3.56	0.63	3.56	0.63	3.38	0.81	0.058	.944
Death of a coworker	3.48	0.88	3.75	0.45	3.06	1.18	3.62	0.72	0.971	.387
Lack of responsiveness by health care professional during a serious situation	3.19	0.73	3.31	0.60	3.00	0.82	3.25	0.78	0.048	.953
Providing care to a coworker's family member who is dying or in a serious condition	3.13	0.89	3.13	0.96	2.69	0.87	3.56	0.63	3.317	.046†
Death of a child	3.12	0.84	3.06	0.93	3.19	0.83	3.13	0.81	0.196	.823
Serious injury to emergency provider in the line of duty	3.02	0.86	3.31	0.70	2.63	1.03	3.13	0.72	0.756	.476
Unexpected patient death	2.98	0.84	2.69	0.79	2.69	0.87	3.56	0.51	5.344	.009‡
Suicide of patient who is or has been in your care	2.90	0.97	2.94	1.00	2.44	0.96	3.31	0.79	1.591	.216
Serious injury of a colleague	2.90	0.99	3.19	0.91	2.63	1.09	2.88	0.96	0.124	.884
Death of a baby from SIDS	2.81	0.98	2.88	0.96	2.75	1.18	2.81	0.83	0.118	.889
Caring for a severely burned patient	2.79	0.92	2.50	0.97	2.88	0.96	3.00	0.82	4.226	.021§
Violence, including verbal abuse, threats, and physical abuse by one member of staff toward another	2.56	0.94	2.44	0.73	2.19	1.11	3.06	0.77	6.533	.003†
Actual/potential contact with infectious body fluids (eg, Hepatitis B, HIV, tuberculosis)	2.52	1.11	2.56	0.89	1.94	1.00	3.06	1.18	2.217	.122
Moral distress	2.35	0.96	2.56	0.96	2.06	0.85	2.44	1.03	1.309	.281
Death of a patient after prolonged resuscitation	2.23	1.11	1.94	0.93	1.75	1.00	3.00	1.03	5.707	.007†
Multiple trauma with massive bleeding or dismemberment	2.19	1.05	2.00	0.97	1.69	0.87	2.88	0.96	5.370	.008†
Dealing with multiple events in a short period	2.19	1.09	2.19	1.11	2.00	1.03	2.37	1.15	0.007	.993
Dealing with hysterical family members	2.10	1.08	1.94	0.85	2.13	1.26	2.25	1.13	0.730	.488
Emergency situation (eg, cardiac arrest or respiratory arrest)	1.85	1.03	1.81	0.75	1.25	0.78	2.50	1.16	5.023	.011†
Unusual situations involving patients but with no deaths involved	1.54	0.85	1.63	0.72	1.50	0.89	1.50	0.97	0.561	.575
Incidents with excessive media coverage	1.48	1.07	1.50	1.21	1.50	1.03	1.69	1.01	1.004	.375

ANCOVA, analysis of covariance; G, general; A, adult; P, pediatric; HIV, human immunodeficiency virus; SIDS, sudden infant death syndrome.

* ANCOVA F statistic reported.

† P > G > A.

‡ P > G = A.

§ P > A > G.

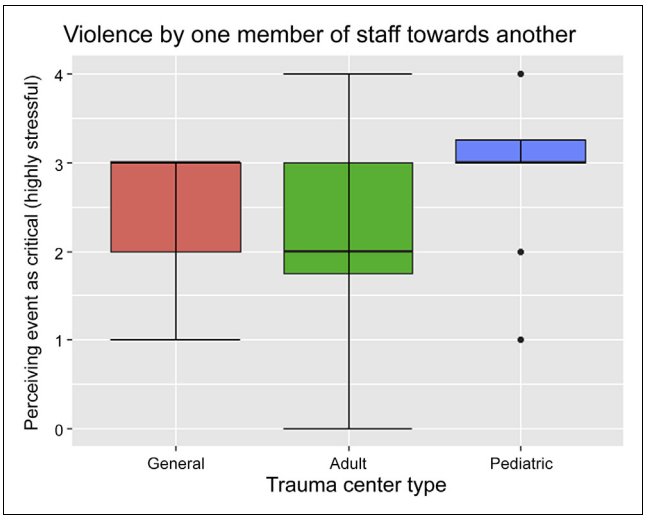

FIGURE 1

Violence, including verbal abuse, threats, and physical abuse by one member of staff toward another.

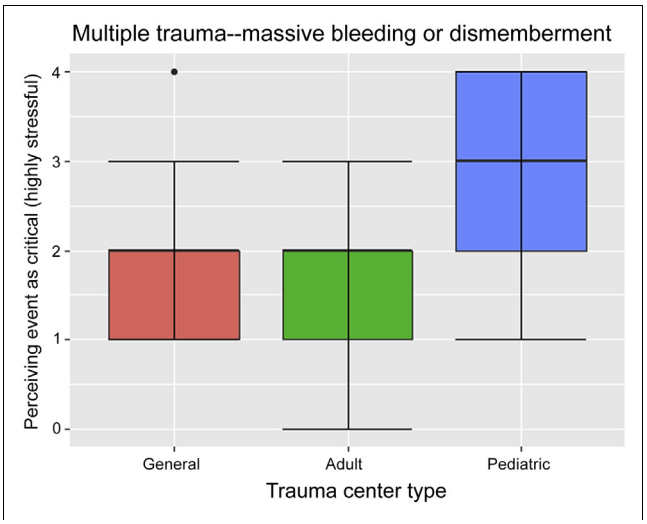

FIGURE 3

Multiple trauma with massive bleeding or dismemberment.

Resilience strategies overall were heavily used by study respondents (81.5 [8.3]). Comparison of overall resilience scores across the groups revealed no significant difference in the overall resilience among the 3 groups ($F[2,41] = 0.199$, $P = .820$): general emergency nurses (79.6 [7.4]), adult emergency nurses (82.9 [7.9]), and pediatric emergency nurses (81.5 [9.7]). Figure 8 displays a boxplot of resilience scores by patient population served.

Discussion

There were 2 research questions addressed in this study; the first was to identify the most stressful clinical events experienced by emergency nurses and whether these events were perceived differently by nurses serving 3 patient population groups, and the second was to examine whether emergency nurse resilience is influenced by the patient population served. This study addressed the gap in the literature by investigating whether the most stressful critical clinical

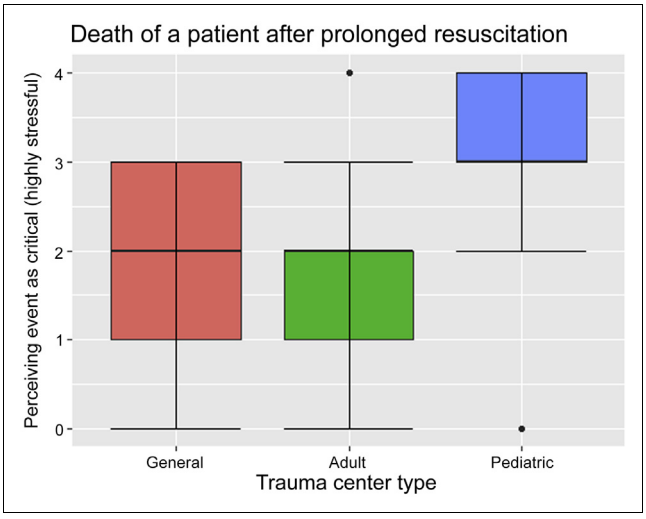

FIGURE 2

Death of a patient after prolonged resuscitation.

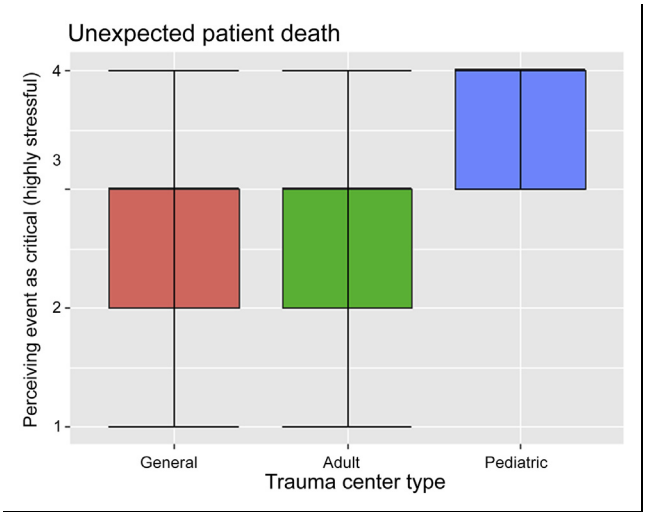

FIGURE 4

Unexpected patient death.

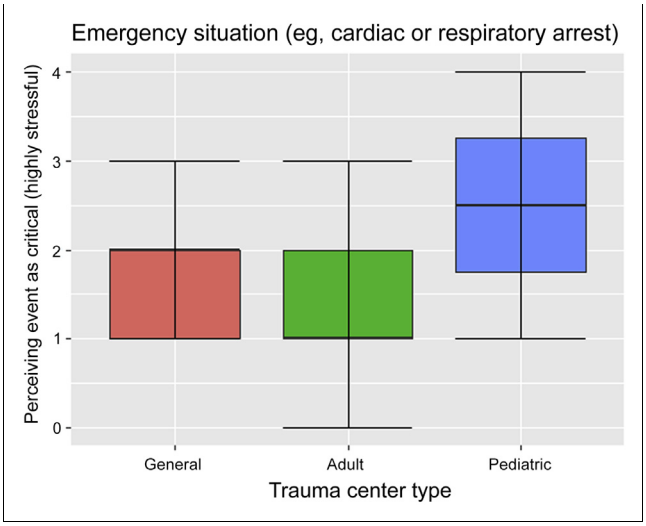

FIGURE 5
Emergency situation (eg, cardiac arrest or respiratory arrest).

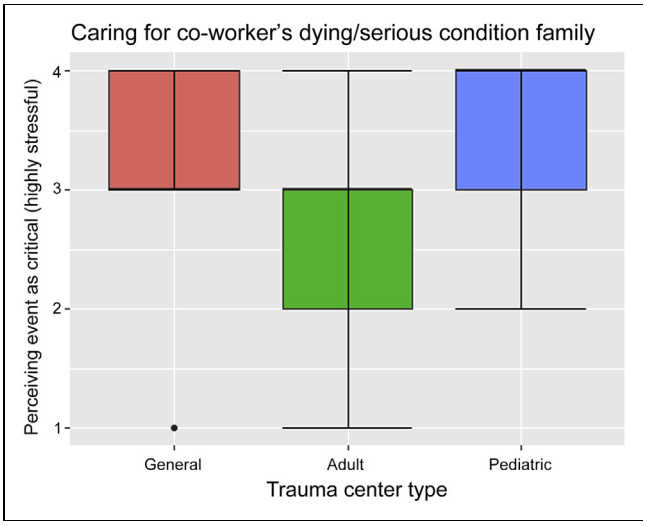

FIGURE 7
Providing care to a coworker's family member who is dying or in a serious condition.

events and resilience differed among emergency nurses based on the type of patient population served. In general, the results of this study indicated that emergency nurses experience several stressful clinical events at work, and several of these stressors are perceived differently by nurses based on the patient population served. Importantly, emergency nurses showed a high level of resilience regardless of the patient population served.

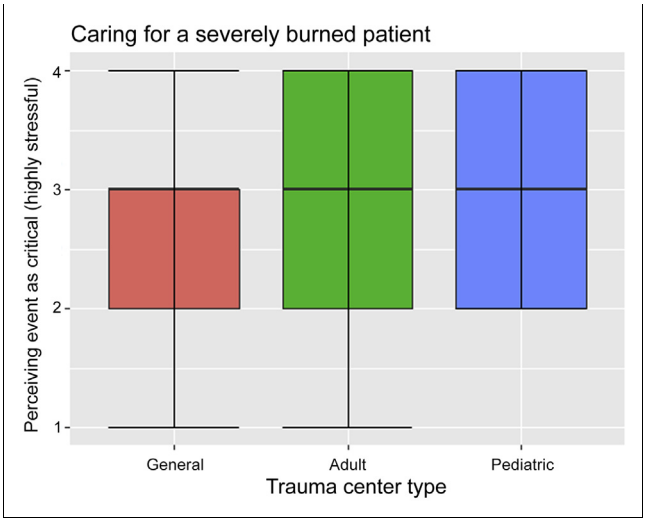

FIGURE 6
Caring for a severely burned patient.

Sexual abuse of a child was ranked as the most stressful event experienced by nurses in this study. This finding is similar to the findings of research by Elder et al[3] and Greenslade et al.[5] Compared with the findings of previous studies, the current study found different highly stressful events for emergency nurses (ie, the death of a coworker and the lack of responsiveness by a colleague during a serious situation). However, this could be due to different assessment methods used to identify these stressors across the studies.

Regarding the stressors with the least impact on emergency nurses, the current study found that dealing with media was rated as the lowest stress-provoking event in the workplace, which is consistent with findings of previous studies.[3,5] Because of the nature of the role of the nurse, emergency nurses are more concerned with providing care to patients during serious events than dealing with media coverage on these events. Other least stress-provoking events reported by the emergency nurses were experiencing emergency situations and witnessing unusual events involving patients without death. This is not surprising, given that these events are common in the ED environment, and emergency nurses are used to managing these situations.

The present study shows that the stress from critical clinical events perceived by emergency nurses varied based on the patient population served. Across the 3 patient populations served, emergency nurses working in adult-based trauma centers were less affected by most of the other stressful critical clinical events. In contrast, compared with other emergency nurses, emergency nurses who served pediatric patient populations were found significantly more

TABLE 3
Post hoc analysis of the stressors perceived significantly different by nurse participants at the 3 types of trauma centers

Clinical event (stressor)	Trauma center population (I)	Trauma center population (J)	Mean difference (I-J)	95% confidence interval	*P* value
Violence, including verbal abuse, threats, and physical abuse by one member of staff toward another	Pediatric	Adult	0.88	0.12-1.63	.020
Death of a patient after prolonged resuscitation	Pediatric	Adult	1.25	0.40-2.10	.002
	Pediatric	General	1.06	0.22-1.91	.011
Multiple trauma with massive bleeding or dismemberment	Pediatric	Adult	1.19	0.39-1.99	.002
	Pediatric	General	0.88	0.08-1.67	.029
Unexpected patient death	Pediatric	Adult	0.88	0.24-1.51	.005
	Pediatric	General	0.88	0.24-1.51	.005
Emergency situation (eg, cardiac or respiratory arrest)	Pediatric	Adult	1.25	0.47-2.03	< .001
Providing care to a coworker's family member who is dying or in a serious condition	Pediatric	Adult	0.88	0.16-1.59	.013

vulnerable to stressors such as violence including verbal abuse, threats, and physical abuse by one member of staff toward another, unexpected death of a patient after prolonged resuscitation, multiple trauma with massive bleeding or dismemberment, unexpected patient death; being involved in emergency situations (eg, cardiac or respiratory arrest), and providing care to a coworker's family member who is dying or in a serious condition. Evidence shows that stressful clinical events (ie, patient death after resuscitation) are more likely to occur in adult emergency departments than in pediatric emergency departments.[25] Generally speaking, desensitization against stressful events results from the increased exposure to these events[26]; therefore, emergency nurses might become less vulnerable to the stressors they experience frequently when providing care to their patients. Alternatively, emergency nurses could develop strong coping mechanisms to the stressful situations they encounter at high rates in the work environment, which would help them better deal with these situations. The high resilience in the study population supports this assertion.

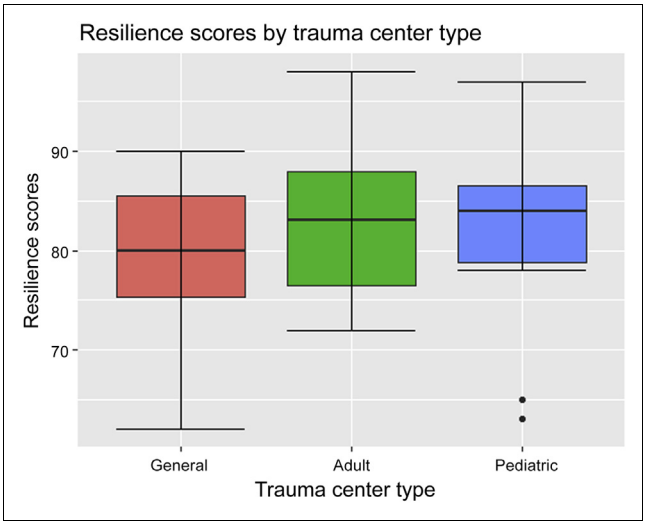

FIGURE 8
Resilience score by type of trauma center.

In terms of resilience, emergency nurses in this study showed high resilience regardless of the patient population served. Emergency nurses in the present study mainly used coping strategies such as adaptation and positive thinking to promote resilience. These coping strategies were reported by nurses in studies by Gholamzadeh et al[11] and Lu et al.[12] This stresses the importance of adopting positive coping strategies to promote emergency nurse resilience against occupational stressors. However, having high resilience could be a barrier for emergency nurses to seek help from Employee Assistance Programs or other psychological counseling services, as these nurses could rely more on self-initiated strategies to cope with psychological stressors than seeking outside help.

As the majority of the current study respondents were White, findings on resilience should be interpreted with

caution. Evidence from literature shows that racism-related stress experienced by nurses from minority racial groups could negatively impact those nurses' resilience. Therefore, one's self-identified race could affect responses to perceived occupational and personal stressors.[27]

Demographic characteristics have an impact on an individual's perceived stress as well as resilience.[13,28] Participants in this study were all female and predominantly non-Hispanic (98%) and White (96%); the demographic characteristics of the sample in this study are quite homogeneous and dissimilar to the demographic characteristics for the registered nursing workforce. The 2020 National Nursing Workforce Survey shows that 90.5% of registered nurses in the United States are female, 80.6% are White, and 94.4% are non-Hispanic.[29] These differences limit the transferability of the study findings to a general nurse population.

The original study, from which the data for this secondary analysis were derived, was conducted before the COVID-19 pandemic. Recent stressors experienced by emergency health care workers due to the COVID-19 pandemic were inadequate personal protective equipment, insufficient guidance on disease management, frequently changing work practices, uncertainty surrounding the decision-making process, concerns of acquiring the disease and transmitting it to others, and increased workload.[30-32] These stressors led to high levels of traumatic stress, anxiety, and burnout among emergency health care workers.[32] However, studies showed that high resilience by adopting positive coping behaviors has enhanced emergency nurses' hardiness against stressors experienced during the pandemic.[33]

Limitations

There are some limitations for the present study. The first limitation is the cross-sectional survey study design, which limits the ability to depict cause-effect relationships. The second limitation is related to the sampling method and size; a total of 48 emergency nurses were recruited through convenience sampling in this study. Recruiting a larger and random sample would increase generalizability. Moreover, there was no verification that nurse participants who rated the critical clinical events in this study experienced these events previously. However, these events are very common in emergency departments, and the majority of events were discussed by nurses in the qualitative focus group interviews conducted in the previous study. In addition, social-desirability bias could impact the reliability of study results; collecting data through self-administered questionnaires increases the risk for this bias, as participants might provide responses that are socially acceptable rather than what they believe.

Implications for Emergency Nurses

Stressors in the workplace for emergency nurses can never be totally eliminated. Therefore, strategies should be adopted to alleviate the impact of these stressors on emergency nurses. Initially, before starting to work in an emergency department, nurses can perform self-assessments for pre-existing stressors, symptoms of anxiety and post-traumatic stress, and use of coping behaviors. In addition, all nurses can be given information for obtaining third-party psychological counseling based on the results from their self-assessment. Nurses' positive coping behaviors should be reinforced, and maladapted behaviors (eg, polysubstance abuse) should be discouraged.

At the primary prevention level, emergency nurses should be educated on work-related stress, its impact on their health, sentinel events and tipping points in relation to stress symptoms, and most importantly, effective strategies to promote resilience. Equally important, the education can include means to identify when an event becomes significant (critical) for them and manage personal stressors. Moreover, emergency nurse managers can conduct anonymous assessments to identify situations perceived as most stressful to their staff as well as the resilience strategies used by the nurses to deal with these stressors. Additional resources can be directed to the emergency department after these events to allow emergency nurses time to mentally recover before returning to their "normal" workflow. Emergency nurses can be coached on using proactive coping strategies to promote their resilience.

At the secondary prevention level, strategies should be adopted to mitigate the effects of highly stressful situations. An example of a world-wide used strategy that is relevant to emergency nurses' experience is The Pause.[34] The Pause is a brief intervention that was suggested by an emergency nurse in 2009. It is a small break for the health care team after the death of a patient to honor the life that ended and to acknowledge the efforts by the members of the health care team.[34] Evidence suggests that The Pause is an effective tool to reduce stress experienced by health care workers who provided care for critically ill patients.[34] Furthermore, emergency nurses who experienced a highly stressful critical clinical event should be offered an informal defusing or formal critical incident stress debriefing session by trained professionals. Debriefing sessions allow for facilitated discussions between emergency nurses to provide reflections on an experience and suggest strategies to promote future behaviors and responses.[35] Because evidence in the literature relative to the effectiveness of immediate debriefing is mixed,[36] participating in these sessions should be voluntary to prevent further psychological distress. In addition, social

networking with colleagues away from the workplace is an opportunity to vent stress and provide mutual support through discussing stressful situations encountered at work.[37] However, work restrictions during the ongoing COVID-19 pandemic may limit this activity. Emergency nurses can still socialize with family members or others within their network who are willing to listen empathetically to their experiences.

At the tertiary prevention level, emergency nurse managers can monitor their staff for signs of acute stress or post-traumatic stress. Appropriate referral to Employee Assistance Programs or other counseling services should be arranged as needed. Such counseling services should be available for emergency nurses at no cost and be optional depending on the impact of the employee's ability to provide safe care.

Future research can investigate other events potentially considered stressful by emergency nurses as well as work-related factors that influence emergency nurse resilience (eg, care of patients during a major infection outbreak, working with insufficient staff and resources). In addition, intervention studies need to be conducted to test the effectiveness of strategies to mitigate the effect of occupational stress on emergency nurses.

Conclusion

Emergency nurses in the present study reported similarities in their leading critical clinical events. Those events that significantly differed by patient population served tended to reflect volume of exposure. The greater volume and commonality of the event were reflected as less critical. While resilience was strong in the study sample, targeted strategies to bolster and protect resilience can be considered for critical clinical events based on patient population served.

Author Disclosures

Conflicts of interest: none to report.

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