

Original article

Impact of prior ICU experience on ICU patient family members' psychological distress: A descriptive study

Chrystal L. Lewis^{*,1}, Jessica Z. Taylor²

University of Missouri, St. Louis, United States

ARTICLE INFO

Article history:

Received 10 May 2016

Received in revised form

19 September 2017

Accepted 22 September 2017

Keywords:

Anxiety

Depression

Families

Intensive care unit

Previous experience

Stress

ABSTRACT

Objective: To determine if current levels of anxiety, depression and acute stress disorder symptoms differ significantly among family members of intensive-care-unit patients depending upon previous intensive-care experience.

Research design: This study used a prospective, descriptive study design.

Setting: Family members (N = 127) from patients admitted within a 72-hour timeframe to the medical, surgical, cardiac and neurological intensive care units were recruited from waiting rooms at a medium-sized community hospital in the Southeastern United States.

Main outcome measures: Participants completed the Hospital Anxiety and Depression Scale, the Impact of Events Scale-Revised, the Acute Stress Disorder Scale and a demographic questionnaire.

Results: A multivariate analysis revealed that family members of intensive-care-unit patients with a prior intensive-care experience within the past two years (n = 56) were significantly more likely to report anxiety, depression and acute stress symptoms, $\Delta = 0.92$, $F[4,122] = 2.70$, $p = 0.034$, partial $\eta^2 = 0.08$, observed power = 0.74.

Conclusion: Results of this study show that family members' psychological distress is higher with previous familial or personal intensive-care experience. Nurses need to assess for psychological distress in ICU family members and identify those who could benefit from additional support services provided in collaboration with multidisciplinary support professionals.

© 2017 Elsevier Ltd. All rights reserved.

Implications for Clinical Practice

- ICU nurses who are aware that family members' previous experience in ICU may contribute to increased anxiety, depression and acute stress disorder symptoms in a subsequent admission may choose to approach these family members with greater sensitivity and awareness of their psychological wellbeing during the hospital stay.
- ICU nurses need to be aware that the experience of anxiety, depression and acute stress disorder symptoms are not limited to first degree relatives and should extend support to all family members, especially if it is not their first ICU experience.
- ICU nurses need to collaborate with families and support professionals, such as counselors or chaplains, to address their psychosocial needs during admission and after patient discharge from the ICU.
- Family members of ICU patients may have difficulty comprehending information while in the ICU, hence the need for follow up, especially if it is not their first ICU experience.

* Corresponding author at: College of Nursing, University of South Alabama, 5721 USA Drive, Mobile, AL 36688, United States.

E-mail addresses: cllewis@southalabama.edu (C.L. Lewis), jztaylor@centralmethodist.edu (J.Z. Taylor).

¹ CL is presently affiliated with University of South Alabama.

² JZT is presently affiliated with Central Methodist University, 2458 Old Dorsett Road, Suite 200, Maryland Heights, MO, 63043, United States.

Introduction

Psychological distress including anxiety, depression and stress in family members of intensive-care-unit (ICU) patients is a well-documented phenomenon across a wide variety of countries including, but not limited to, Brazil, Italy, China, Greece, France, Sweden, the United Kingdom and the United States (Chiang et al., 2016; Davidson et al., 2012; Fumis et al., 2015; Jones et al., 2012; Konstanti et al., 2016; Mistraletti et al., 2016; Pochard et al., 2001). Family members may show psychological distress when trying to comprehend simple concepts (Rutherford and von Wenckstern, 2016) such as that of time. For example, in one clinical instance experienced by the first author, a family was repeatedly unable to grasp the concept of time regarding when the end of a nurse's shift occurred; yet, this same family was asked to make crucial life or death decisions. This clinical example embodies what is now known from scientific advances in neurobiology, which demonstrates that humans under stress have a reduced recall capacity and recognition performance (Schwabe et al., 2012).

A family member's ICU admission is a stressful event, which was confirmed via saliva cortisol levels by Turner-Cobb et al. (2016); however, for some family members, the stress experienced exceeds the expected acute stress reaction and may actually lead to the development of post-traumatic stress disorder (PTSD) (Sundararajan et al., 2014). The overstimulating influence of technology present in the ICU environment was identified as a contributing factor to psychological distress in family members of an ICU patient (Fumis and Deheinzeln, 2009). Researchers have conceptualised this persistent psychological distress experienced by family members of ICU patients as *Postintensive Care Syndrome–Family (PICS-F; Davidson et al., 2012)*.

Despite the acknowledgment that PICS-F may occur for up to four years after an ICU experience, no known research has investigated whether previous ICU experience contributes to the symptoms of anxiety, depression and stress experienced by families of an ICU patient. This particular lack of literature is intriguing when considered with the recommendation from 1996 by Jamerson et al. (1996) for nurses to assess family members' prior experiences with ICUs as part of the ICU-education process for the family members. The purpose of this study was to determine if levels of anxiety, depression and acute stress disorder symptoms differ significantly among family members of ICU patients depending upon previous ICU experience. For the purposes of this study, previous ICU experience is defined as an ICU encounter within the previous two years, with no limitations on who was the patient in the previous ICU experience(s).

Methods

Research question

The aim of this study was to answer the following research question: Do levels of anxiety, depression, and acute stress disorder symptoms differ significantly among family members of ICU patients, depending upon previous ICU experience?

Design and setting

This study used a prospective, descriptive study design. Family members of ICU patients were recruited from waiting areas in medical, surgical-trauma, cardiac and neurological ICUs in a single, medium-sized community medical center in a mid-sized Southeastern United States urban area with a total of 45 ICU beds.

Participants

A convenience sample of participants was recruited from the four ICUs via study-recruitment flyers posted prominently around the waiting areas. The study recruitment flyer indicated that family members in the waiting rooms and family members of patients admitted within the past 72 hours to the ICU were eligible to participate. Sample size was determined using G*Power for a MANOVA with two independent groups, four response variables, a small effect size of 0.10, significance level of 0.05, and power of 0.80. This resulted in a needed sample size of 126 participants. In addition to active recruitment through the posted study flyers, snowball sampling was encouraged. Additional participant characteristics are presented in Table 1.

Inclusion and exclusion criteria

Inclusion criteria were:

- Having a family member admitted to the ICU as an ICU-status patient within the past 72 hours;
- Ability to read and write in English;
- Presently being 19 years of age or older
- Having physically visited the patient since the patient's admission to the ICU.

Exclusion criteria:

- Cognitively-impaired family members were excluded from the study, determined by nursing judgement.
- Four family-member participants per patient were already enrolled.

Ethical approval

The institutional review board (IRB) of the participating university and hospital facility granted an expedited review approval, reference numbers 453564-2 and S-1009. Participants completed a written consent form after communicating interest in participating to ICU staff.

Data collection

Data were collected from June 2013 through September 2014. See Fig. 1 for recruitment process. Family members who communicated interest to ICU staff about participating received paper copies of the consent form, the demographic questionnaire, the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983), the Acute Stress Disorder Scale (ASDS) (Bryant et al., 2000) and the Impact of Events Scale – Revised (IES-R) (Weiss and Marmar, 1997) to complete at the time of enrollment. Initially, only 17 participants from approximately 400 identified family members were enrolled in the study. Recruitment increased after a \$10 financial incentive was introduced. The incentive was disbursed upon return of the study materials.

Measures

Hospital anxiety and depression scale

The HADS was developed for screening purposes only to assess anxiety and depression in a general hospital setting but is not used to make a diagnosis of a psychiatric disorder (Zigmond and Snaith, 1983). The HADS consists of a total of 14 items culminating in two subscales, one for anxiety and one for depression; each subscale is comprised of seven items (Zigmond and Snaith, 1983). The HADS is a self-report measure using a four-point Likert-type scale in which

Table 1
Means and standard deviations by demographic variables on the dependent variables.

Variable	HADS Anxiety Score	HADS Anxiety	HADS Anxiety	HADS Depression Score	HADS Depression	HADS Depression	ASDS	ASDS	ASDS	IES-R	IES-R	IES-R
	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N
Age												
19–20	8.00	4.24	7	3.57	2.99	7	34.80	9.66	7	29.57	13.07	7
21–30	11.00	4.70	18	7.28	3.49	18	51.33	16.92	18	44.01	15.31	18
31–40	11.42	6.30	19	7.54	5.19	19	52.14	25.37	19	45.18	23.94	19
41–50	11.82	3.96	21	7.46	4.24	21	48.35	14.27	21	43.84	18.55	21
51–60	9.53	3.95	36	6.28	4.47	36	44.36	17.31	36	37.02	21.80	36
61–70	8.25	4.53	20	4.71	2.31	20	38.45	18.32	20	32.65	19.28	20
71–80	11.21	2.94	5	6.25	2.22	5	43.29	8.04	5	33.72	7.82	5
81+	6.00	–	1	4.00	–	1	68	–	1	62.00	–	1
Total	10.15	4.65	127	6.39	4.09	127	45.86	18.30	127	39.33	19.93	127
Collapsed Age												
19–30	10.16	4.70	25	6.24	3.71	25	46.70	16.84	25	39.96	15.89	25
31–40	11.42	6.30	19	7.54	5.19	19	52.14	25.37	19	45.18	23.94	19
41–50	11.82	3.96	21	7.46	4.24	21	48.35	14.27	21	43.84	18.55	21
51–60	9.53	3.95	36	6.28	4.47	36	44.36	17.31	36	37.02	21.80	36
61–70	8.25	4.53	20	4.71	2.31	20	38.45	18.32	20	32.65	19.28	20
71+	10.34	3.39	6	5.87	2.19	6	47.41	12.39	6	38.43	13.50	6
Total	10.15	4.65	127	6.39	4.09	127	45.86	18.30	127	39.33	19.93	127
Gender												
Male	9.08	4.41	22	5.59	3.46	22	43.98	20.44	22	37.85	23.85	22
Female	10.38	4.69	105	6.55	4.20	105	46.25	17.90	105	39.64	19.12	105
Total	10.15	4.65	127	6.39	4.09	127	45.86	18.30	127	39.33	19.93	127
Revised Education Level												
eighth grade & Some HS	12.17	5.17	12	8.58	4.89	12	55.06	21.42	12	50.74	19.08	12
HS Graduate & GED	9.14	4.62	42	6.48	3.66	42	46.67	19.43	42	39.47	22.28	42
Some College	10.74	4.56	50	5.90	4.03	50	46.51	18.07	50	40.39	18.86	50
4 yr College Graduate & Grad School	9.67	4.38	23	6.13	4.40	23	38.16	12.09	23	30.81	15.02	23
Total	10.15	4.65	127	6.39	4.09	127	45.86	18.30	127	39.33	19.93	127
Collapsed Relationship to Pt												
10.76	4.70	17	7.82	4.33	17	43.63	15.51	17	36.31	19.12	17	
Significant Other												
Son	8.84	2.59	12	5.69	3.69	12	46.22	17.93	12	35.73	20.61	12
Daughter	10.29	5.53	33	6.73	3.65	33	46.72	20.71	33	40.56	22.20	33
Mother	11.00	3.56	4	6.50	2.65	4	46.86	20.38	4	41.00	16.45	4
In Law	9.25	5.60	8	5.00	3.70	8	46.75	20.06	8	37.75	21.14	8
10.75	3.84	12	6.75	4.31	12	45.67	15.81	12	38.67	17.57	12	
Grandchild												
10.38	4.46	7	8.37	6.59	7	40.00	10.74	7	39.58	11.87	7	
Niece/Nephew												
Sister	9.53	5.20	21	4.73	3.58	21	46.82	19.98	21	38.64	19.43	21
Brother	10.26	2.07	4	6.81	2.64	4	50.00	19.68	4	56.50	20.50	4
Other	10.43	4.96	7	7.00	5.66	7	50.49	23.71	7	40.08	28.39	7
Total	10.10	4.66	125	6.43	4.09	125	45.92	18.35	125	39.28	20.02	125
Previous ICU Experience												
Yes	11.63	4.313	56	7.21	4.25	56	50.03	16.89	56	46.71	19.07	56
No	8.98	4.73	71	5.74	3.86	71	42.57	18.80	71	35.87	20.04	71
Total	10.15	4.65	127	6.39	4.09	127	45.86	18.30	127	39.33	19.93	127
Planned Admission												
Yes	9.38	4.73	34	5.06	3.44	34	40.14	14.62	34	32.82	15.49	34
No	10.43	4.61	93	6.87	4.21	93	47.95	19.11	93	41.70	20.89	93
Total	10.15	4.65	127	6.39	4.09	127	45.86	18.30	127	39.33	19.93	127

participants rate the statements as zero (*not at all*) to three (*very often*). The higher the total score in each subscale, the greater the probability of the participant having anxiety or depression. A score

of eight is considered a mild case of either depression or anxiety and subscales of 16 or higher are considered severe (Snaith, 2003).

The HADS has a previously reported Cronbach alpha ranging 0.68–.93 with a mean of 0.83 for the anxiety subscale and 0.67–.90

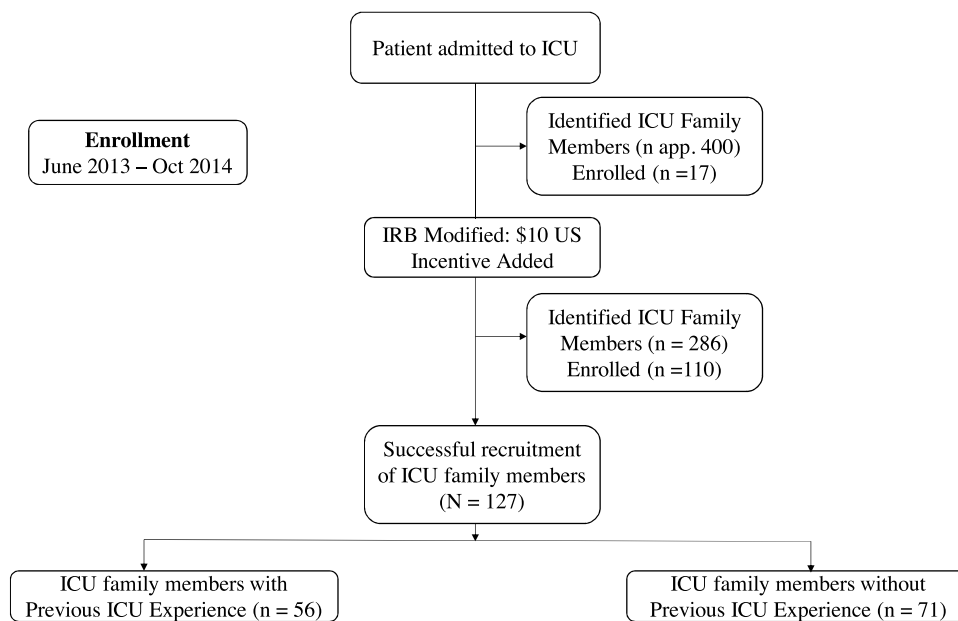


Fig. 1. Flow diagram of recruitment process.

with a mean of 0.82 for the depression subscale (Bjelland et al., 2002). In the current study, the HADS anxiety subscale had a Cronbach alpha value of 0.87, and the HADS depression subscale had a Cronbach alpha value of 0.76. Construct and criterion validity have been documented from a review of literature including over 700 studies in adult general and medical illness populations (Bjelland et al., 2002). The HADS was successfully used in several studies examining anxiety and depression in family members of ICU patients (Anderson et al., 2008; Azoulay et al., 2005; Fumis and Deheinzeln, 2009; Lautrette et al., 2007; Pochard et al., 2005, 2001).

Acute stress disorder scale

The ASDS was developed as a self-report screening instrument to measure an acute stress reaction in order to identify acutely traumatised individuals at risk to develop subsequent PTSD (Bryant et al., 2000). The ASDS contains 19-items on a five-point Likert-type scale in which the participants rate the statements as 1 (*not at all*) to 5 (*very much*). Two additional questions ask the participant to briefly describe the recent traumatic experience and to answer “yes” or “no” if the experience frightened them. A total score of 56 on the ASDS was found to be predictive of 91% of those who would eventually develop PTSD and 93% of those who did not develop PTSD. Bryant et al. previously reported an internal consistency value for the ASDS of 0.96 as calculated for a sample of adult survivors of a traumatic event. In the current study, the ASDS had a Cronbach alpha value of 0.94. The ASDS was used successfully in a study examining acute stress in family members of ICU patients (Auerback et al., 2005).

The impact of events scale – revised

The IES-R is comprised of 22 items with three subscales: hyperarousal, avoidance and intrusion. The IES-R was revised to add an additional measure of hyperarousal symptoms along with the evaluation of intrusion and avoidance symptoms that were assessed in the original version of the impact of events scale (IES) to be reflective of the DSM-IV criteria for PTSD (Weiss and Marmar, 1997). The IES-R was successfully used in studies investigating both acute stress and PTSD symptoms in family members of ICU patients (McAdam et al., 2012; Sundararajan et al., 2014). Previously, the

hyperarousal subscale has had a Cronbach alpha value ranging from 0.79 to 0.90; the avoidance subscale has had a Cronbach alpha value ranging from 0.84 to 0.86 and the intrusion subscale has had a reported Cronbach alpha value ranging from 0.87 to 0.92 (Weiss and Marmar, 1997). The previously-reported internal consistency of the IES-R was established from two different cohorts of adults who witnessed traumatic events. In the current study, the IES-R had a total Cronbach alpha value of 0.96, an intrusion subscale Cronbach alpha value of 0.92, an avoidance subscale Cronbach alpha value of 0.88, and a hyperarousal subscale Cronbach alpha value of 0.91.

Demographic questionnaire

The six-question demographic questionnaire was developed by the first author to characterise the sample using selected demographic variables of age, gender, level of education, relationship to the patient, if this was a planned or unplanned ICU admission and if the family member has had any experience with an ICU in the past two years.

Data analysis

Data were de-identified and stored in a secured, locked cabinet by the first author. Consent forms and contact forms were separated from the instrument forms. The first author collected the surveys. Survey responses were analysed by both authors using the SPSS 23.0 statistical package. The survey responses were analysed using descriptive statistics and MANOVA with follow-up univariate ANOVAs. The MANOVA included four dependent variables measuring three constructs: (a) anxiety symptoms measured by the HADS, (b) depression symptoms measured by the HADS and (c) acute stress disorder symptoms measured by the ASDS and the IES-R. Statistical significance was set at $p < 0.05$ (two-tailed).

Results

A total of 127 participants were enrolled in the study. The majority of participants were female ($n = 105$, 82.68%). A MANOVA revealed a statistically significant main effect for anxiety, depression, and acute stress disorder symptoms between groups of

Table 2
Multivariate analysis of variance and follow-up univariate analysis of variance.

MANOVA					
	Wilks' Lambda	F	Significance	Partial η^2	Observed Power
Previous ICU Experience	$\Lambda = 0.92$	$F [4122] = 2.70$	$p = .034$	0.08	0.74
Univariate ANOVAs					
	F	Significance	Partial η^2	Observed Power	
Anxiety	$F(1, 125) = 11.03$	$p < 0.001$	0.08	0.91	
Depression	$F(1, 125) = 4.16$	$p = .044$	0.03	0.53	
ASD (ASDS)	$F(1, 125) = 5.39$	$p = .022$	0.04	0.63	
ASD (IES-R)	$F(1, 125) = 4.99$	$p = .027$	0.04	0.60	

participants with and without previous ICU experience, $\Lambda = 0.92$, $F [4122] = 2.70$, $p = 0.034$, partial $\eta^2 = 0.08$, observed power = 0.74. To identify the source of the main effect, univariate ANOVAs were conducted on each of the four dependent variables. All four dependent variables were found to have significant ANOVA F statistics (see Table 2).

Previous ICU experience affected anxiety symptoms as measured on the HADS anxiety subscale, $F(1, 125) = 11.03$, $p < .001$, partial $\eta^2 = 0.08$, observed power = 0.91. Participants who had previously experienced an ICU admission themselves or with a family member within the past two years had significantly higher anxiety symptom scores than participants who had not experienced an ICU admission themselves or with a family member within the past two years.

Previous ICU experience affected depression symptoms as measured on the HADS depression subscale, $F(1, 125) = 4.16$, $p = 0.044$, partial $\eta^2 = 0.03$, observed power = 0.53. Family members of ICU patients who had previously experienced an ICU admission themselves or with a family member within the past two years had significantly higher depression symptom scores than participants who had not experienced an ICU admission themselves or with a family member within the past two years.

Previous ICU experience affected stress symptoms as measured on the ASDS, $F(1, 125) = 5.39$, $p = 0.022$, partial $\eta^2 = 0.04$, observed power = 0.63. Family members of ICU patients who had previously experienced an ICU admission themselves or with a family member within the past two years had significantly higher stress symptom scores as measured by the ASDS than participants who had not experienced an ICU admission themselves or with a family member within the past two years.

Finally, previous ICU experience affected stress symptoms as additionally measured on the IES-R, $F(1, 125) = 4.99$, $p = 0.027$, partial $\eta^2 = 0.04$, observed power = 0.60. Family members of ICU patients who had previously experienced an ICU admission themselves or with a family member within the past two years had significantly higher stress symptom scores as measured by the IES-R than participants who had not experienced an ICU admission themselves or with a family member within the past two years.

There were 22 different relationships between the patient and participant identified. These 22 relationships were categorised into two relationship categories – first degree relative (i.e., parent, sibling, child, $n = 74$) or not first degree relative (i.e., all other relationships, $n = 53$). A MANOVA failed to detect a difference in psychological distress symptoms on the four study distress measures based upon relationship degree status to patients, $\Lambda = 0.95$, $F(4, 122) = 1.61$, $p = 0.177$, partial $\eta^2 = 0.05$, observed power = 0.48. Follow-up univariate ANOVAs did not reveal significant differences between the two

relationship status groups on any of the four distress measures.

Discussion

In this study, the psychological distress of family members of ICU patients differed significantly depending upon their previous ICU experience. Further exploration for the source of the main effect revealed statistically significant differences for anxiety, depression and acute stress disorder symptoms measured by the HADS, ASDS, and IES-R. Those participants who had previously experienced an ICU admission themselves or with a family member within the past two years had significantly higher anxiety, depression, and acute stress disorder symptom scores than those who had not previously had an ICU admission within the past two years.

This was a surprising finding because the investigators thought that previous experience may serve as a mitigating factor for anxiety, depression and acute stress symptoms experienced by family members of ICU patients. An informal convenience sample of ICU nurses ($n = 30$) revealed that nursing intuition suggests novice ICU patient's family members would experience more psychological distress and need more support during a family member's ICU admission than ICU patient's family members with previous ICU experience. Thus, there appears some carryover effect from a previous ICU admission that nurses familiar with the results of this study did not previously consider, assess for or intentionally prevent with multidisciplinary support. The current study's finding that previous ICU experiences (self or family member) are associated with higher distress symptoms may lend support to the findings in the literature that family members of ICU patients may experience PTSD after the experience of navigating the ICU (Jones et al., 2012; McAdam et al., 2012; Sundararajan et al., 2014).

In addition, collaboration with chaplain services, social services, counseling services and patient advocates is encouraged to assist with addressing how an ICU family member's previous ICU experience may be affecting current psychological distress. Collaborating support professionals' acknowledgement and normalization of family members' psychological distress related to previous ICU experience can provide family members with a safe outlet to share openly and honestly about their affective experiences in a way that does not burden the patient. Furthermore, support professionals could facilitate informational group experiences for family members of ICU patients; being certain to invite family members with previous ICU experience as well as family members with no previous ICU experience. Rutherford and von Wenckstern (2016) recently described a trauma information group conducted by their institution's chaplaincy department for family members of ICU patients. Participants reported these groups as being very helpful to them in getting to speak with and receive support from other family members of ICU patients.

The current study also examined the family member's relationship to the patient and influence on psychological distress symptoms and found no difference based upon first-degree relationship status. Thus, ICU nurses should be cognizant that ICU-patient family members who experience anxiety, depression, and acute stress disorder symptoms are not limited to a first-degree relative such as a spouse, parent, or child but also include extended family such as aunts, uncles, nieces, and nephews.

Future research

Future research should explore ICU family members' previous ICU experiences in greater detail, possible examples include asking about:

- The type of ICU previously experienced
- Relation to the patient previously admitted
- The previous patient's ICU-survival status
- If the current patient has been previously admitted to the ICU
- What influence the prior ICU-admission experience has on decision making with the current ICU admission.

While this study was in progress, new diagnostic criteria for acute stress disorder and PTSD were published, which exclude witnessing an illness or natural death from the definition of a traumatic event (American Psychiatric Association, 2013). In contrast, results from this study indicate a high-intervention illness or natural death in an ICU environment may have a similar PTSD effect on family members of ICU patients. Future intensive and critical care nursing research could further explore benefits of offering information groups facilitated by collaborating support professionals specifically to ICU family members with previous ICU experience.

Limitations

This study recruited from only one healthcare facility setting in the southern United States. This investigation found that in this setting, an incentive of \$10 cash was needed to increase participation in the study. Furthermore, this study focused solely upon the family members of ICU patients. No patient information was obtained, including patient's age or status classification such as using an APACHE-II score or opinion-based scoring system such as "stable," "guarded," or "critical". Previous ICU experience was addressed as a closed-ended yes or no option.

Conclusion

The results of this study suggest that family members' psychological distress is actually higher with previous ICU experience. These findings are of important consideration in light of the first author's lived professional experience in a variety of critical care settings of a disregard of Jameson et al.'s (1996) recommendation for nursing to assess ICU patient family members' previous ICU experience. The ICU patient family member's experience of psychological distress transcends a single culture or country. Nurses should assess for psychological distress in ICU patient family members and address with multidisciplinary support. As a global health phenomenon, nursing needs to assess family members' previous ICU experience when providing family-centered care for ICU patients and families.

Conflict of interest

None.

Funding sources

This work was supported by the Nu Chi Chapter of Sigma Theta Tau International.

Ethical statement

This study was approved by the University of Missouri – St. Louis IRB as an expedited study, package number 453564-2.

Acknowledgements

Dr. Jean Bachman, Dr. Tom Ahrens.

References

- American Psychiatric Association, 2013. *Diagnostic and Statistical Manual of Mental Disorders, fifth ed.* American Psychiatric Association, Washington D.C.
- Anderson, W.G., Arnold, R.M., Angus, D.C., Bryce, C.L., 2008. Posttraumatic stress and complicated grief in family members of patients in the intensive care unit. *J. Gen. Intern. Med.* 23, 1871–1876. <http://dx.doi.org/10.1007/s11606-008-0770-2>.
- Auerback, S.M., Kiessler, D.J., Wartella, J., Rausch, S., Ward, K.R., Ivatury, R., 2005. Optimism, satisfaction with needs met, interpersonal perceptions of the health-care team, and emotional distress in patients' family members during critical care hospitalization. *Am. J. Crit. Care* 14 (3), 202–210.
- Azoulay, E., Pochard, F., Kentish-Barnes, N., Chevret, S., Aboab, J., Adrie, C., et al., 2005. Risk of post-traumatic stress symptoms in family members of intensive care unit patients. *Am. J. Respir. Crit. Care Med.* 171 (9), 987–994. <http://dx.doi.org/10.1164/rccm.200409-1295OC>.
- Bjelland, I., Dahl, A.A., Haug, T.T., Neckelmann, D., 2002. The validity of the hospital anxiety and depression scale. *J. Psychosom. Res.* 52 (2), 69–77. [http://dx.doi.org/10.1016/S0022-3999\(01\)00296-3](http://dx.doi.org/10.1016/S0022-3999(01)00296-3).
- Bryant, R.A., Moulds, M.L., Guthrie, R.M., 2000. *Acute Stress Disorder Scale: a self-report measure of acute stress disorder.* *Psychol. Assess.* 12 (1), 61–68.
- Chiang, V., Chien, W., Wong, H., Lee, R., Ha, J., Leung, S., Wong, D., 2016. A brief cognitive-behavioral psycho-education (B-CBE) program for managing stress and anxiety of main family caregivers of patients in the intensive care unit. *Int. J. Environ. Res. Public Health.* 13 (10), 962. <http://dx.doi.org/10.3390/ijerph13100962>.
- Davidson, J.E., Jones, C., Bienvenu, O.J., 2012. Family response to critical illness: postintensive care syndrome-family. *Crit. Care Med.* 40 (2), 618–624. <http://dx.doi.org/10.1097/CCM.0b013e318236ebf9>.
- Fumis, R.R.L., Deheinzeln, D., 2009. Family members of critically ill cancer patients: assessing the symptoms of anxiety and depression. *Intensive Care Med.* 35 (5), 899–902. <http://dx.doi.org/10.1007/s00134-009-1406-7>.
- Fumis, R.R.L., Ranzani, O.T., Faria, P.P., Schettino, G., 2015. Anxiety, depression, and satisfaction in close relatives of patients in an open visiting policy intensive care unit in Brazil. *J. Crit. Care* 30 (2), 440. <http://dx.doi.org/10.1016/j.jcrc.2014.11.022> (e1–440, e6).
- Jamerson, P., Scheibemer, M., Bott, M.J., Crighton, F., Hinton, R.H., Cobb, A.K., 1996. *The experiences of families with a relative in the intensive care unit.* *Heart Lung* 25 (6), 467–474.
- Jones, B.C., Csci, M., Bäckman, C., Griffiths, R.D., 2012. Intensive care diaries and relatives' symptoms of posttraumatic stress disorder after critical illness: a pilot study. *Am. J. Crit. Care* 21 (3), 172–176. <http://dx.doi.org/10.1016/j.ijnurstu.2015.03.020>.
- Konstanti, Z., Gouva, M., Dragioti, E., Nakos, G., Koulouras, V., 2016. Symptoms of cardiac anxiety in family members of intensive care unit patients. *Am. J. Crit. Care* 25 (5), 448–456. <http://dx.doi.org/10.4037/ajcc2016642>.
- Lautrette, A., Darmon, M., Megarbane, B., Joly, L.M., Chevret, S., Adrie, C., et al., 2007. A communication strategy and brochure for relatives of patients dying in the ICU. *New Engl. J. Med.* 356 (5), 469–478. <http://dx.doi.org/10.1056/NEJMoa063446>.
- McAdam, J.L., Fontaine, D.K., White, D.B., Dracup, K.A., Puntillo, K.A., 2012. Psychological symptoms of family members of high-risk intensive care unit patients. *Am. J. Crit. Care* 21 (6), 386–394. <http://dx.doi.org/10.4037/ajcc2012582>.
- Mistrali, G., Umbrello, M., Mantovani, E.S., Moroni, B., Formenti, P., Spanu, P., et al., 2016. A family information brochure and dedicated website to improve the ICU experience for patients' relatives: an Italian multicenter before-and-after study. *Int. Care Med.* 1, 1–11. <http://dx.doi.org/10.1007/s00134-016-4592-0>.
- Pochard, F., Azoulay, E., Chevret, S., Lemaire, F., Hubert, P., Canoui, P., et al., 2001. Symptoms of anxiety and depression in family members of intensive care unit patients: ethical hypothesis regarding decision-making capacity. *Crit. Care Med.* 29 (10), 1893–1897. <http://dx.doi.org/10.1097/00003246-200110000-00007>.
- Pochard, F., Darmon, M., Fassier, T., Bollaert, P.-E., Cheval, C., Coloigner, M., et al., 2005. Symptoms of anxiety and depression in family members of intensive care unit patients before discharge or death. A prospective multicenter study. *J. Crit. Care* 20 (1), 90–96. <http://dx.doi.org/10.1016/j.jcrc.2004.11.004>.
- Rutherford, L.G., von Wenckstern, T., 2016. Trauma information group: a level I trauma center's integrated approach to family support. *J. Trauma Nurs.* 23, 357–360. <http://dx.doi.org/10.1097/JTN.0000000000000247>.

- Schwabe, L., Joëls, M., Roozendaal, B., Wolf, O.T., Oitzl, M.S., 2012. Stress effects on memory: an update and integration. *Neurosci. Biobehav. Rev.* 36 (7), 1740–1749, <http://dx.doi.org/10.1016/j.neubiorev.2011.07.002>.
- Snaith, R.P., 2003. The hospital anxiety and depression scale. *Health Qual. Life Outcomes* 1 (1), 29, <http://dx.doi.org/10.1186/1477-7525-1-29>.
- Sundararajan, K., Martin, M., Rajagopala, S., Chapman, M.J., 2014. Posttraumatic stress disorder in close relatives of intensive care unit patients' evaluation (PRICE) study. *Aust. Crit. Care* 27 (4), 183–187, <http://dx.doi.org/10.1016/j.aucc.2014.04.003>.
- Turner-Cobb, J.M., Smith, P.C., Ramchandani, P., Begen, F.M., Padkin, A., 2016. The acute psychobiological impact of the intensive care experience on relatives. *Psychol. Health Med.* 21 (1), 20–26, <http://dx.doi.org/10.1080/13548506.2014.997763>.
- Weiss, D.S., Marmar, C.R., 1997. *The impact of events scale-revised*. In: Wilson, J., Keane, T. (Eds.), *Assessing Psychological Trauma and PTSD*, second ed. Guilford Press, New York, pp. 399–411.
- Zigmond, A.S., Snaith, R.P., 1983. The hospital anxiety and depression scale. *Acta Psychiatr. Scand.* 67 (6), 361–370, <http://dx.doi.org/10.1111/j.1600-0447.1983.tb09716.x>.