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References

- Rhee CL, Cuttica M. Palliative care and advance care planning in pulmonary hypertension. *Adv Pulm Hypertens* 2018;17:15–19.
- Gin-Sing W. Palliative care in pulmonary arterial hypertension. *Curr Opin Support Palliat Care* 2017;11:7–11.
- Khifan G, Tonelli AR, Ramsey J, Sahay S. Palliative care in pulmonary arterial hypertension: an underutilised treatment. *Eur Respir Rev* 2018;27:1–9.
- Milne D, Aranda S, Jefford M, Schofield P. Development and validation of a measurement tool to assess perceptions of palliative care. *Psychooncology* 2013;22:940–946.
- Chin KM, Gomberg-Maitland M, Channick RN, Cuttica MJ, Fischer A, Frantz RP, et al. Psychometric validation of the Pulmonary Arterial Hypertension-Symptoms and Impact (PAH-SYMPACT) questionnaire: results of the SYMPHONY trial. *Chest* 2018;154:848–861.
- McCullister D, Shaffer S, Badesch DB, Filusch A, Hunsche E, Schüler R, et al.; IRB information for the 5 clinical sites. Development of the Pulmonary Arterial Hypertension-Symptoms and Impact (PAH-SYMPACT®) questionnaire: a new patient-reported outcome instrument for PAH. *Respir Res* 2016;17:72.
- Benza RL, Gomberg-Maitland M, Elliott CG, Farber HW, Foreman AJ, Frost AE, et al. Predicting survival in patients with pulmonary arterial hypertension: the REVEAL risk score calculator 2.0 and comparison with ESC/ERS-based risk assessment strategies. *Chest* 2019;156:323–337.
- Hrustanovic-Kadic M, Ziegler C, Kim R, El-Kersh K. Palliative care perception in patients with pulmonary arterial hypertension [abstract]. *Am J Respir Crit Care Med* 2020;201:A6609
- Berry LL, Castellani R, Stuart B. The branding of palliative care. *J Oncol Pract* 2016;12:48–50.
- Dai YX, Chen TJ, Lin MH. Branding palliative care units by avoiding the terms “palliative” and “hospice: a nationwide study in Taiwan. *Inquiry* 2017;54:1–6.
- Kimeu AK, Swetz KM. Moving beyond stigma—are concurrent palliative care and management of pulmonary arterial hypertension irreconcilable or future best practice? *Int J Clin Pract Suppl* 2012;66:2–4.
- Studer SM. Might rebranding palliative care improve its integration into treatment for those patients diagnosed with pulmonary arterial hypertension? *Adv Pulm Hypertens* 2018;17:34–35.
- Fenstad ER, Shanafelt TD, Sloan JA, Novotny PJ, Durst LA, Frantz RP, et al. Physician attitudes toward palliative care for patients with pulmonary arterial hypertension: results of a cross-sectional survey. *Pulm Circ* 2014;4:504–510.
- Swetz KM, Shanafelt TD, Drozdowicz LB, Sloan JA, Novotny PJ, Durst LA, et al. Symptom burden, quality of life, and attitudes toward palliative care in patients with pulmonary arterial hypertension: results from a cross-sectional patient survey. *J Heart Lung Transplant* 2012;31:1102–1108.

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Peritraumatic Stress Symptoms during Early Post-Intensive Care Unit Recovery

To the Editor:

The coronavirus disease (COVID-19) pandemic has already left many intensive care unit (ICU) survivors in its wake (1–4). Although its long-term psychological impact on survivors is not yet known, prior data suggest ICU survivors often have upsetting memories of the ICU experience (e.g., fears of death, breathing

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discomfort, hallucinations during delirium) that may precede new or worsening mental health problems (5, 6). Few studies have examined the early phase of post-ICU recovery (7), including peritraumatic stress symptoms that can occur during or in the immediate aftermath of a traumatic experience. These symptoms, such as feeling emotionally numb or disconnected from reality, are linked to later post-traumatic stress disorder (PTSD) onset in other populations (8–10), suggesting they may be harbingers of future PTSD (11). Despite their potential implications for screening and intervention, peritraumatic stress symptoms remain underinvestigated among critical illness survivors.

Prior to the COVID-19 pandemic, we conducted a small descriptive study to assess peritraumatic dissociative symptoms and other behavioral factors during early post-ICU survivorship to inform larger studies and interventions. We interviewed patients before hospital discharge and 1 month after discharge using validated assessments. Here, we report early post-ICU survivors’ psychological symptoms, which may be useful in the context of growing efforts to support their mental health.

Methods

Adult English-speaking patients who were admitted to or recently transferred from the medical ICU were identified in collaboration with clinicians using discharge rosters. Research staff then monitored medical charts and approached patients to introduce the study when medically and cognitively stable. Those with severe baseline cognitive impairment, severe psychiatric conditions, or anticipated discharge to hospice were excluded. The study was conducted with Institutional Review Board

Table 1. Demographic and key variables for sample at baseline ($n = 15$) and follow-up ($n = 10$)

Characteristic	Baseline ($n = 15$) [Median (IQR) or n (%)]	1-Month Follow-Up ($n = 10$) [Median (IQR) or n (%)]
Age, yr	48 (41–63)	48 (37–59)
Sex		
Female	9 (60%)	5 (50%)
Male	6 (40%)	5 (50%)
Race		
Black	6 (40%)	5 (50%)
White	6 (40%)	3 (30%)
Asian or Pacific Islander	1 (7%)	1 (10%)
Other	2 (13%)	1 (10%)
Ethnicity		
Hispanic/Latino	4 (27%)	2 (20%)
Non-Hispanic/Latino	11 (73%)	8 (80%)
Education level		
High school diploma	2 (13%)	1 (10%)
Some college	5 (33%)	3 (30%)
College degree	5 (33%)	4 (40%)
Graduate/professional degree	3 (20%)	2 (20%)
Reason for ICU admission		
Respiratory failure	5 (33%)	3 (30%)
Renal failure	4 (27%)	3 (30%)
Sepsis or septic shock	5 (33%)	4 (40%)
Other	1 (7%)	
ICU length of stay, d	3 (2–13)	3 (2–12)
Prior psychiatric diagnosis (self-report)		
Yes	6 (40%)	4 (40%)
No	9 (60%)	6 (60%)
Depressive symptoms (HADS)	4 (2–9)	6.50 (4.75–7.75)
Anxiety symptoms (HADS)	8 (5–11)	5 (1.50–10.25)
Peritraumatic dissociative symptoms (PDEQ)	19 (12–31)	—
PTSD symptoms (IES-R)	—	29.50 (13.25–38.75)
Self-rated health (EQ-5D-5L)	50 (50–70)	62.50 (40–85)
Loneliness (3-item Loneliness Scale)	4 (3–8)	4 (3–8)
Stress-management interest (1–10 Likert)	9 (6.50–10)	6 (2.50–9)

Definition of abbreviations: HADS = Hospital Anxiety and Depression Scale; ICU = intensive care unit; IES-R = Impact of Events Scale-Revised; IQR = interquartile range; PDEQ = Peritraumatic Dissociative Experiences Questionnaire; PTSD = post-traumatic stress disorder. % indicates percentage of those with available data for the time point.

approval; written informed consent was obtained. Data were collected between July 2018 and November 2019.

Trained research staff conducted brief, 30-minute interviews with participants within approximately 1 week before anticipated hospital discharge and by telephone approximately 1 month following hospital discharge. At baseline, all participants were given a list of community mental health resources to use as needed.

Measures. Instrument selection was guided by the recommended Core Outcomes Set (12, 13). We explored additional psychosocial factors using validated tools. At baseline, patients rated dissociative symptoms on the Peritraumatic Dissociative Experiences Questionnaire (PDEQ) (14) to index peritraumatic reactions. At follow-up, PTSD symptoms were measured using the Impact of Events Scale-Revised (IES-R) (15). At both assessments, patients rated anxiety and depressive symptoms using the Hospital Anxiety and Depression Scale (HADS-A and HADS-D subscales) (16), health status using the EQ-5D-5L (17), loneliness (3-item Loneliness scale) (18), and interest

in stress management resources (1-item Likert rating). Coping strategies were assessed at follow-up (Brief COPE) (19).

Analysis. Descriptive statistics (median; interquartile range [IQR]) were used to evaluate symptom severity. Cronbach's alpha was used to assess scale internal reliability. Based on prior work, we calculated the proportion of patients who scored above clinically significant symptom thresholds for depressive symptoms (HADS-D subscale ≥ 8 [16]), anxiety symptoms (HADS-A subscale ≥ 8 [16]), peritraumatic dissociation (PDEQ ≥ 15 [20]), and PTSD symptoms (IES-R ≥ 33 [21]). Given prior work suggesting links between early peritraumatic dissociation and subsequent PTSD symptoms (8, 11), we conducted exploratory analyses to summarize the proportion scoring above and below threshold on the baseline PDEQ and 1-month IES-R in a 2×2 frequency table. We refrained from formally testing differences because of the small sample size and one cell with zero observations, but we explored the bivariate association (Spearman's rho) between continuous scores on each measure; we acknowledge

Table 2. Frequencies of scores above and below thresholds on baseline peritraumatic dissociative symptoms (PDEQ) and follow-up posttraumatic stress symptoms (IES-R) among participants with follow-up data ($n = 10$)

Baseline (Before Hospital Discharge)	Follow-Up (1-Mo Postdischarge)		Row Total
	Lower Posttraumatic Stress Symptoms (IES-R < 33)	Higher Posttraumatic Stress Symptoms (IES-R \geq 33)	
Lower peritraumatic dissociative symptoms (PDEQ < 15)	4 (40%)	0 (0%)	4 (40%)
Higher peritraumatic dissociative symptoms (PDEQ \geq 15)	2 (20%)	4 (40%)	6 (60%)
Column total	6 (60%)	4 (40%)	—

Definition of abbreviations: IES-R = Impact of Events Scale-Revised; PDEQ = Peritraumatic Dissociative Experiences Questionnaire.

these results should be interpreted with caution given the small sample size.

Results

The 15 enrolled participants were primarily middle-aged (median, 48 years; range, 21–76 yr) females (60%) admitted to the medical ICU for respiratory failure (33%) or sepsis (33%); see Table 1. Prior to hospital discharge, 67% reported significant peritraumatic dissociative symptoms (PDEQ \geq 15). Participants most commonly endorsed (“very true” or “extremely true”) that what was happening felt unreal (47%), that their body felt distorted or disconnected (33%), and that they were surprised to find that they were unaware of events that had happened (33%) during hospitalization. In total, 33% and 53% reported clinically significant depressive symptoms and anxiety symptoms, respectively (HADS subscale \geq 8). Internal consistency was acceptable to excellent for HADS-D, HADS-A, and PDEQ scales (Cronbach’s alpha = 0.81, 0.75, and 0.92, respectively). On the loneliness scale, 20%, 27%, and 33% reported they “often” felt isolated, left out, or lacked companionship, respectively. Median self-rated health on the EQ-5D-5L was 50 (IQR, 50–70) on a 1–100 scale. The majority (73%) rated high interest in learning ways to manage their stress (\geq 7 on a 1–10 Likert scale). Eleven patients were discharged home, and four were discharged to a skilled nursing facility.

Ten patients (67%) completed 1-month follow-up interviews; nine were at home and one was in a rehabilitation facility. Three patients did not return calls, one patient declined completing the interview because of competing time demands, and one patient died in the interim. Of these 10 patients, 20% and 30% reported clinically significant depressive symptoms and anxiety symptoms, respectively. Forty percent had elevated trauma-related symptoms. In exploratory analyses, baseline PDEQ scores and follow-up IES-R scores were correlated (Spearman’s rho = 0.70; $P = 0.02$). As shown in Table 2, all four of the cases with clinically significant IES-R scores at follow-up were among those with above-threshold peritraumatic dissociative symptoms at baseline, whereas none of those with below-threshold baseline PDEQ scores had clinically significant IES-R scores at follow-up. Median Brief COPE subscale scores indicated participants’ most frequently used coping strategies were emotional support, religion, acceptance, and planning. Median self-rated health was 62.5 (IQR, 40–85). Forty percent rated high interest

in stress-management resources (\geq 7 on 1–10 scale) at follow-up.

Discussion

These data provide a glimpse into patients’ early post-ICU recovery experience. Peritraumatic dissociative symptoms were common during hospitalization. A notable subset endorsed clinically significant depression, anxiety, and trauma-related symptoms prior to hospital discharge and at 1-month postdischarge. Most patients were interested in stress-management resources before hospital discharge.

In the context of these results and the larger ICU survivorship literature, we offer several suggestions that may inform emerging research efforts. Patients without severe cognitive impairment were able to complete 30-minute interviews in the hospital, and scales were internally consistent, suggesting initial feasibility of these procedures. Before hospital discharge, patients endorsed peritraumatic stress symptoms such as derealization. Notably, caregivers likewise had peritraumatic symptoms during patients’ ICU admissions in a separate study (22). Accordingly, interventions introduced during hospitalization likely need to account for or directly address these symptoms. Given links between peritraumatic stress and PTSD risk in other groups (8–10), this approach could have potential benefits for mitigating PTSD onset (23). Although this study was not designed for predictive purposes, exploratory analysis suggested a bivariate link between predischarge peritraumatic dissociative symptoms and 1-month PTSD symptoms. These exploratory results should be interpreted with caution given the small sample size and should not be used for causal inference. Yet, this pattern raises several questions for future well-powered, prospective studies to test this link and inform potential clinical utility, such as the following: Does screening for peritraumatic stress at hospital discharge help determine which patients may benefit from further monitoring and intervention for posthospital PTSD? Do interventions targeting early peritraumatic symptoms help to mitigate longer-term PTSD among ICU survivors?

Additionally, though most hospitalized patients were interested in stress-management resources, fewer were interested 1 month later. Although this pattern might reflect differential attrition or symptom abatement, it suggests that stress-management approaches or referrals may be met with greater interest before hospital discharge than at a later time. Finally, ICU

survivors' mental health symptoms in this study and the broader literature highlight the importance of integrating behavioral health services during discharge planning and multidisciplinary follow-up.

This pilot study's limitations include its small sample size and the possibility of selection bias. A larger study is needed to determine whether these findings are generalizable to the broader population of ICU survivors. Strategies to improve study retention are also likely to be useful, including increased contact attempts (24). In addition, we assessed dissociative symptoms to reflect patients' peritraumatic reactions during hospitalization and reserved assessment of posttraumatic symptoms for the posthospital period. In future work, it may also be helpful to include a broader index of trauma-related symptoms at baseline for comparison (e.g., IES-R, IES-6), which was a limitation of this study.

Overall, this small study draws attention to the peritraumatic stress symptoms experienced by ICU survivors in the early postacute recovery period, an underrecognized phenomenon. Current pandemic-related factors (e.g., visitation restrictions, fears regarding resource scarcity) could exacerbate acute stress symptoms. Research and clinical innovations to maximize psychological recovery for ICU survivors continue to be urgently needed. As the COVID-19 pandemic response begins to include survivorship care, multidisciplinary efforts should include a strong focus on psychological health.

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References

- Goyal P, Choi JJ, Pinheiro LC, Schenck EJ, Chen R, Jabri A, *et al*. Clinical characteristics of Covid-19 in New York City. *N Engl J Med* 2020;382:2372–2374.
- Cummings MJ, Baldwin MR, Abrams D, Jacobson SD, Meyer BJ, Balough EM, *et al*. Epidemiology, clinical course, and outcomes of critically ill adults with COVID-19 in New York City: a prospective cohort study. *Lancet* 2020;395:1763–1770.
- Wunsch H. Mechanical ventilation in COVID-19: interpreting the current epidemiology. *Am J Respir Crit Care Med* 2020;202:1–4.
- Quah P, Li A, Phua J. Mortality rates of patients with COVID-19 in the intensive care unit: a systematic review of the emerging literature. *Crit Care* 2020;24:285.
- Jackson JC, Jutte JE, Hunter CH, Ciccolella N, Warrington H, Sevin C, *et al*. Posttraumatic stress disorder (PTSD) after critical illness: a conceptual review of distinct clinical issues and their implications. *Rehabil Psychol* 2016;61:132–140.
- Train S, Kydonaki K, Rattray J, Stephen J, Weir CJ, Walsh TS. Frightening and traumatic memories early after intensive care discharge. *Am J Respir Crit Care Med* 2019;199:120–123.
- Brown SM, Bose S, Banner-Goodspeed V, Beesley SJ, Dinglas VD, Hopkins RO, *et al*. Approaches to addressing post-intensive care syndrome among intensive care unit (ICU) survivors: a narrative review. *Ann Am Thorac Soc* 2019;16:947–956.
- Ozer EJ, Best SR, Lipsey TL, Weiss DS. Predictors of posttraumatic stress disorder and symptoms in adults: a meta-analysis. *Psychol Bull* 2003;129:52–73.
- Shalev AY, Peri T, Canetti L, Schreiber S. Predictors of PTSD in injured trauma survivors: a prospective study. *Am J Psychiatry* 1996;153:219–225.
- van der Mei WF, Barbano AC, Ratanatharathorn A, Bryant RA, Delahanty DL, deRoos-Cassini TA, *et al*. International Consortium to Predict PTSD. Evaluating a screener to quantify PTSD risk using emergency care information: a proof of concept study. *BMC Emerg Med* 2020;20:16.
- Kumpula MJ, Orcutt HK, Bardeen JR, Varkovitzky RL. Peritraumatic dissociation and experiential avoidance as prospective predictors of posttraumatic stress symptoms. *J Abnorm Psychol* 2011;120:617–627.
- Needham DM, Sepulveda KA, Dinglas VD, Chessare CM, Friedman LA, Bingham CO III, *et al*. Core outcome measures for clinical research in acute respiratory failure survivors: an international modified Delphi consensus study. *Am J Respir Crit Care Med* 2017;196:1122–1130.
- Semler MW, Bernard GR, Aaron SD, Angus DC, Biros MH, Brower RG, *et al*. Identifying clinical research priorities in adult pulmonary and critical care: NHLBI Working Group Report. *Am J Respir Crit Care Med* 2020;204:511–523.
- Marmar CR, Weiss DS, Metzler TJ. The peritraumatic dissociative experiences questionnaire. *Assess. Psychol. Trauma PTSD* 1997;2:144–168.
- Weiss DS. The impact of event scale: revised. In: Wilson JP, Tang CS, editors. *Cross-cultural assessment of psychological trauma and PTSD*. New York, NY: Springer; 2007. pp. 219–238.
- Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand* 1983;67:361–370.
- Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, *et al*. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). *Qual Life Res* 2011;20:1727–1736.
- Hughes ME, Waite LJ, Hawkey LC, Cacioppo JT. A short scale for measuring loneliness in large surveys: results from two population-based studies. *Res Aging* 2004;26:655–672.
- Carver CS. You want to measure coping but your protocol's too long: consider the brief COPE. *Int J Behav Med* 1997;4:92–100.
- Garroute-Orgeas M, Coquet I, Périer A, Timsit JF, Pochard F, Lancrin F, *et al*. Impact of an intensive care unit diary on psychological distress in patients and relatives*. *Crit Care Med* 2012;40:2033–2040.
- Creamer M, Bell R, Failla S. Psychometric properties of the impact of event scale - revised. *Behav Res Ther* 2003;41:1489–1496.
- Derry HM, Lief L, Schenck EJ, Berlin DA, Prigerson HG. Peritraumatic stress among caregivers of patients in the intensive care unit. *Ann Am Thorac Soc* 2020;17:650–654.
- Prigerson HG, Viola M, Brewin CR, Cox C, Ouyang D, Rogers M, *et al*. Enhancing & mobilizing the POTential for Wellness & Emotional Resilience (EMPOWER) among surrogate decision-makers of ICU patients: study protocol for a randomized controlled trial. *Trials* 2019;20:408.
- Eakin MN, Eckmann T, Dinglas VD, Akinremi AA, Hosey M, Hopkins RO, *et al*. Association between participant contact attempts and reports of being bothered in a national, longitudinal cohort study of ARDS survivors. *Chest* 2020;158:588–595.

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