

WHAT'S NEW IN INTENSIVE CARE



Mental health morbidity, self-harm, and suicide in ICU survivors and caregivers

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Mental health morbidity among ICU survivors

Decades of research clearly demonstrate that survivors of critical illness experience substantial morbidity following discharge from the intensive care unit (ICU), collectively referred to as “post-intensive care syndrome” (PICS) [1–3]. This includes important downstream mental health morbidity. Initial work from an observational cohort of mechanically ventilated ICU survivors from Denmark found a higher incidence of mood and anxiety disorders (e.g., depression, post-traumatic stress disorder [PTSD]), as compared to non-ICU hospitalized patients [4]. Furthermore, ICU survivors had an increased use of psychotropic medications, particularly antidepressants and sedative-hypnotics. Two large cohorts from separate populations in Canada similarly found that ICU survivorship was associated with increased incidence of new mental health diagnoses [5, 6], a relationship that persisted for years following ICU discharge. There is also evidence that survivors of critical illness are at risk of substance misuse [6]. Among opioid naïve patients experiencing mechanical ventilation, 2.6% were found to have persistent opioid use after discharge, which was higher than matched non-ICU control patients (1.5%) [7]. Finally, more recent work from Ontario, Canada found that ICU survivors have higher rates of deliberate self-harm and suicide, as compared to matched non-ICU hospitalized patients [8]. Thus, in addition to the common physical and cognitive sequelae that they experience, survivors of critical illness are at increased risk of new mental health diagnoses, psychotropic medication use, substance misuse, deliberate

self-harm, and suicide. This work has identified an important aspect of PICS that providers must consider in the care of the critically ill.

Mental health morbidity among caregivers

While much of the research on post-ICU mental health morbidity has focused upon the survivors themselves, emerging data shows that caregivers of ICU patients are similarly impacted. The collective sequelae experienced by family members of ICU survivors are collectively referred to as PICS-family (PICS-F) [1]. More than half of patients who have received prolonged mechanical ventilation will require caregiver support up to 1 year following discharge, creating an enormous burden on these caregivers [9]. Similarly, there are few resources available to support caregivers. Previous data from the Canadian RECOVER cohort found that nearly 2/3 of caregivers reported symptoms of depression at the time of patient discharge, and 43% at 1-year post-discharge [10]. In this cohort of caregivers, scores on psychological well-being and overall mental health showed pronounced deterioration over time, while physical symptoms were relatively stable. Similar results have since been presented. In a population-based cohort of spouses of critically ill patients with sepsis and septic shock, the incidence of new mental illness among spouses was 23.5%, which was in excess of the general population during the same time period [11]. Finally, very recent prospective data from France showed that caregivers of patients with acute respiratory distress syndrome (ARDS) secondary to coronavirus disease 2019 (COVID-19) had higher incidence of PTSD symptoms compared to not only the general public, but caregivers of patients with ARDS from other causes [12]. This underscores the role of the pandemic, which has clearly heightened concerns of post-discharge mental health morbidity among ICU survivors and their caregivers.

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Table 1 Summary of incidence and prognostic factors for mental health morbidity among adult ICU survivors and their caregivers, as discussed in this article

Post-discharge outcome	Adult survivors of critical illness		Caregivers of adult survivors of critical illness	
	Incidence/adjusted odds	Prognostic factors	Incidence/adjusted odds	Prognostic factors
Any mental health diagnosis	Adjusted HR 3.42 (95% CI 1.96–5.99) [4] ^a Adjusted HR 1.08 (95% CI 1.07–1.10) [5] Adjusted PR 1.08 (95% CI 1.05–1.11) at 1-year [6]	Mechanical ventilation [5] ICU length of stay [5]	Adjusted IR 1.21 (95% CI 1.18–1.25) [11]	Hospital length of stay [11] Increasing patient age [11] Younger caregiver age [10] Patient comorbidity burden [11] Low income [11]
Mood/anxiety/post-traumatic stress disorder	Adjusted PR 1.12 (95% CI 1.09–1.16) at 1-year [6]	Unknown	Post-traumatic stress disorder symptoms in 33% of caregivers [9] Depressive symptoms: 67% of caregivers at 7 days, 49% at 3 months; 43% at 6 months [10]	Younger caregiver age [10] Less social support [10] COVID-19 infection [12]
Schizophrenia/psychosis	Adjusted PR 0.85 (95% CI 0.78–0.93) at 1-year [6]	Unknown	Unknown	Unknown
New psychotropic medication use	Adjusted HR 2.45 (95% CI 2.19–2.74) at 3 months [4] ^a Adjusted PR 1.05 (95% CI 1.02–1.08), Antidepressants [6] Adjusted PR 1.11 (95% CI 1.09–1.14), Anxiolytics [6] Adjusted PR 1.30 (95% CI 1.25–1.35) [6]	Unknown	Unknown	Unknown
Any substance misuse	Adjusted PR 1.33 (95% CI 1.23–1.44) at 1-year [6]	Unknown	Unknown	Unknown
Persistent opioid use	Adjusted OR 1.37 (95% CI 1.19–1.58) [7] ^a	Surgical patient (vs. medical) [7] ICU length of stay [7]	Unknown	Unknown
Intentional self-harm	Adjusted HR 1.15 (95% CI 1.12–1.19) [8]	Pre-existing depression/anxiety [8] Mechanical ventilation [8] Renal replacement therapy [8]	Unknown	Unknown
Suicide	Adjusted HR 1.22 (95% CI 1.11–1.33) [8]	Pre-existing depression/anxiety [8] Pre-existing post-traumatic stress disorder [8] Mechanical ventilation [8] Renal replacement therapy [8]	Unknown	Unknown

Abbreviations: *HR* hazard ratio, *IR* incidence rate ratio, *PR* prevalence ratio, *OR* odds ratio, *ICU* intensive care unit, *COVID-19* coronavirus disease 2019

^a Only includes patients receiving mechanical ventilation

Prediction and mitigation of risk

While clinical evidence supports the existence of mental health morbidity in these vulnerable populations, much less is known about the underlying mechanisms, or how this risk might be mitigated. There are a number of plausible explanations. First, critical care is itself traumatic. It often involves invasive interventions, coupled with deep sedation. Delirium is common, and may be associated with a number of mental health sequelae, namely PTSD [13]. While there has been disagreement on the

association between ICU length of stay or severity of illness with mental health morbidity [5, 6, 8, 13], a number of studies have shown that incidence of new mental health diagnoses is associated with invasive procedures, such as mechanical ventilation [5]. Similarly, invasive mechanical ventilation and renal replacement therapy were prognostic for self-harm and suicide among ICU survivors [8]. Patients are isolated from social contacts, and this has been particularly true during the COVID-19

pandemic. In fact, regular family visitation during ICU admission may be associated with reduced risk of post-discharge mental health morbidity [14]. Additionally, the course of critical illness often results in physical restrictions among survivors [1–3], and as such, psychological suffering may arise from such limitations.

Second, critical illness may exacerbate pre-existing mental health morbidity. Existing reports on mental health outcomes among ICU survivors indicate that pre-existing mental health diagnoses prior to ICU admission are common [5, 6, 8], and these diagnoses were significant prognostic factors for future self-harm and suicide [8]. Among patients with pre-existing mental health diagnoses, psychotropic medications may be held during their admission, or not restarted at the time of discharge. These patients may also lose contact with primary care providers or psychiatrists. Finally, and closely tied to the above, there are a lack of supports in place for many ICU survivors and caregivers. Lack of support and low income have been associated with self-harm and suicide among ICU survivors [8], and mental health morbidity among caregivers [10, 11].

Future directions

The preceding evidence on mental health morbidity among ICU survivors and their caregivers is summarized in Table 1. While evidence is accumulating, major gaps in our current understanding exist.

Given geographical disparities in support structures, there is a role for more descriptive data, particularly with regard to suicide and self-harm. Currently, the majority of studies conducted on mental health morbidity among ICU survivors come from North America and Europe. As mentioned, little data exists on the ICU-related causes of post-discharge mental health morbidity, and identification of such causal and mediating factors may allow for novel methods of risk mitigation. If invasive therapies are associated with increased mental health morbidity, then there is interest in studying such outcomes among subgroups of patients who experience the most invasive and prolonged treatments, such as extracorporeal life support.

Treatment to attenuate the risk of downstream mental health morbidity is an active area of research. Investigation of interventions initiated during ICU admission (such as diaries) have had mixed evidence of benefit [15, 16], but further studies are needed, and ideally in collaboration with our colleagues in mental health. Similarly, the involvement of mental healthcare providers (such as psychiatrists) is relatively rare during ICU admission, but has been seen as a potential avenue in improving outcomes in PICS [17]. Additionally, there may be a role for organized follow-up of ICU survivors, including early mental health

involvement after discharge, though it is important to first identify whether such follow-up is effective at mitigating downstream mental health morbidity.

Finally, with regard to caregivers, there is a need to further identify mental health outcomes. There is growing concern that caregivers may be experiencing mental health hospitalization, self-harm, and suicide, which would have important implications for the healthcare system. The more we discover about mental health outcomes in ICU survivors and caregivers, the more we realize must be done to care for these vulnerable populations.

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SMF, OTR, and MSH reviewed the relevant literature and wrote the manuscript. All authors participated in the revision process. All authors co-wrote and revised the manuscript for intellectual content. All authors provided their final approval for manuscript submission. All authors agree to be accountable for all aspects of the work.

Funding

None.

Declarations

Conflicts of interest

None of the authors report any relevant conflict of interest.

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Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Received: 29 March 2022 Accepted: 14 May 2022

Published: 7 June 2022

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