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Delirium

Psychometric evaluation of the Hospital Anxiety and Depression Scale 3 months after acute lung injury

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ABSTRACT

Purpose: To conduct a psychometric evaluation of the Hospital Anxiety and Depression Scale (HADS) and to evaluate associations of 2 measures of psychological distress with the HADS Anxiety (HADS-A) and HADS Depression (HADS-D) subscales in acute lung injury (ALI) survivors.
Materials and Methods: We used 3-month post-ALI follow-up data from 151 participants in a multisite prospective cohort study to evaluate the internal consistency and structure of the HADS subscales and items, respectively. We used Spearman ρ correlations and other statistics to relate the 3-level version of the EuroQol-5D (EQ-5D-3L) anxiety/depression item and Medical Outcomes Study Short Form-36 (SF-36) "mental health"–related domains to the HADS subscales.
Results: Internal consistency was good for each of the HADS subscales ($\alpha \geq .70$). Exploratory factor analysis revealed a 2-factor structure (anxiety and depression). The EQ-5D-3L item and the SF-36 mental health–related domain scores were associated with HADS-A ($\rho = 0.54$ and -0.48 to -0.70, respectively) and HADS-D ($\rho = 0.41$ and -0.48 to -0.52, respectively) scores (all $P < .01$). The relationship between the SF-36 mental health domain score and the HADS-A subscale score was particularly strong ($\rho = -0.70$, $P < .01$).
Conclusions: When evaluated in ALI survivors, the HADS has good internal consistency and a 2-factor structure. The HADS subscales were substantially correlated with the EQ-5D-3L anxiety/depression item and SF-36 mental health–related domain scores, suggesting convergent validity for these measures of psychological distress in ALI survivors.

1. Introduction

Survivors of critical illnesses, especially acute lung injury (ALI), frequently have substantial psychological distress, including clinically significant symptoms of anxiety and depression, with associated decrements in functioning and quality of life [1–8]. Thus, it is important to ensure that reliable and valid measures of psychological distress are available for this population.

One of the most widely used measures of anxiety and depressive symptoms in general medical settings, the Hospital Anxiety and Depression Scale (HADS) [9–12], is also used commonly in critical illness survivors [2,5–7,12]. The HADS is validated for assessing general anxiety and depressive symptoms in a wide variety of general medical patients [11–19]; however, there has been limited psychometric evaluation of the HADS in critical illness survivors. In general medical samples, the number of factors supported in analyses of the HADS items has varied from 1 [17] to the more familiar 2 [11,13,14,16,20,21] or even 3 [15]. Thus, it is relevant to determine whether the constructs measured using the HADS (ie, anxiety and depressive symptoms) are identifiable (at least partially separable) in ALI survivors. In addition, it is important to understand how the HADS subscales relate to other commonly used measures of psychological distress in this population, to provide information to clinicians and researchers who want to know the extent to which results from different instruments are comparable.

In the current study, we focused on survivors of ALI, an archetypal critical illness [22]. We hypothesized that (1) the HADS items would cohere into 2 related factors (anxiety and depressive symptoms) and (2) that there would be at least moderate associations of the HADS subscales with the 3-level version of the EuroQol-5D (EQ-5D-3L) anxiety/depression item and the Medical Outcomes Study Short Form-36 (SF-36) mental health–related domains.

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2. Materials and methods

2.1. Study design and patient sample

This psychometric analysis was conducted as part of a multisite prospective cohort study. A total of 520 participants with ALI were recruited from 13 intensive care units (ICUs) at 4 hospitals in Baltimore, MD. Institutional review board approval was obtained at all participating sites, with a waiver of informed consent granted for abstraction of preexisting data from the medical record. Written informed consent was obtained from survivors after they regained decision-making capacity [23] or from a proxy if the patient remained incapable. Of the 520 participants enrolled, 284 (55%) survived to hospital discharge [24]. Of those 284 survivors, 38 (13%) died after discharge, 37 (13%) declined consent, and 13 (<5%) were lost to follow-up, leaving 196 consenting survivors, 151 (77%) of whom had completed all measures of interest at 3-month follow-up (Fig. 1). Of the 196 consenting survivors at 3-month follow-up, there were no differences in age, sex, or race distributions between the 151 participants who completed all measures of interest and the 45 who did not.

Participants in this prospective cohort study were consecutive, mechanically ventilated adults with ALI [25] enrolled between October 2004 and October 2007. Patients in ICUs specializing in neurologic conditions and ALI patients with primary neurologic disease and/or brain trauma were not eligible for enrollment. In addition, the following were key exclusion criteria: (1) more than 5 days of mechanical ventilation during hospitalization prior to enrollment, (2) preexisting ALI for more than 24 hours before transfer to a study ICU, (3) preexisting illness with a life expectancy less than 6 months, (4) a limitation in use of life support (other than a sole "no cardiopulmonary resuscitation" order) at the time of enrollment, (5) prior lung resection, (6) preexisting cognitive impairment or communication/language barriers, and (7) no fixed address for follow-up purposes (ie, homelessness).

2.2. Measures

All outcome assessments were performed by research assistants at 3-month post-ALI follow-up. Anxiety and depressive symptoms were evaluated using the HADS (14 items, 2 subscales; Table 1). In addition, we evaluated an item from the EQ-5D-3L that assesses symptoms of anxiety/depression [26]. The EQ-5D-3L uses a descriptive system that includes 3 response options (ie, no problems, moderate problems, or extreme problems; Table 1). Finally, we also included data from the version 2 of SF-36 quality of life instrument [27]. The SF-36 has 8 domains; in the current study, we evaluated norm-based scores for 4 domains related to mental health (vitality, social functioning, role emotional, and mental health). Each domain has a score range of 0 to 100 (general population mean = 50; SD = 10), with higher scores indicating better quality of life (Table 1).

2.3. Statistical analyses

We evaluated the internal consistency reliability of the anxiety and depression subscales of the HADS with Cronbach α coefficient. We performed exploratory (principal components) factor analysis (PCA) with all 14 HADS items to determine whether a 2-factor structure is evident in ALI survivors, as observed in other medical populations. Because anxiety and depressive symptoms should be correlated, we performed an oblimin rotation. We then assessed the convergent validity of the EQ-5D-3L anxiety/depression item and the 4 SF-36 domains as

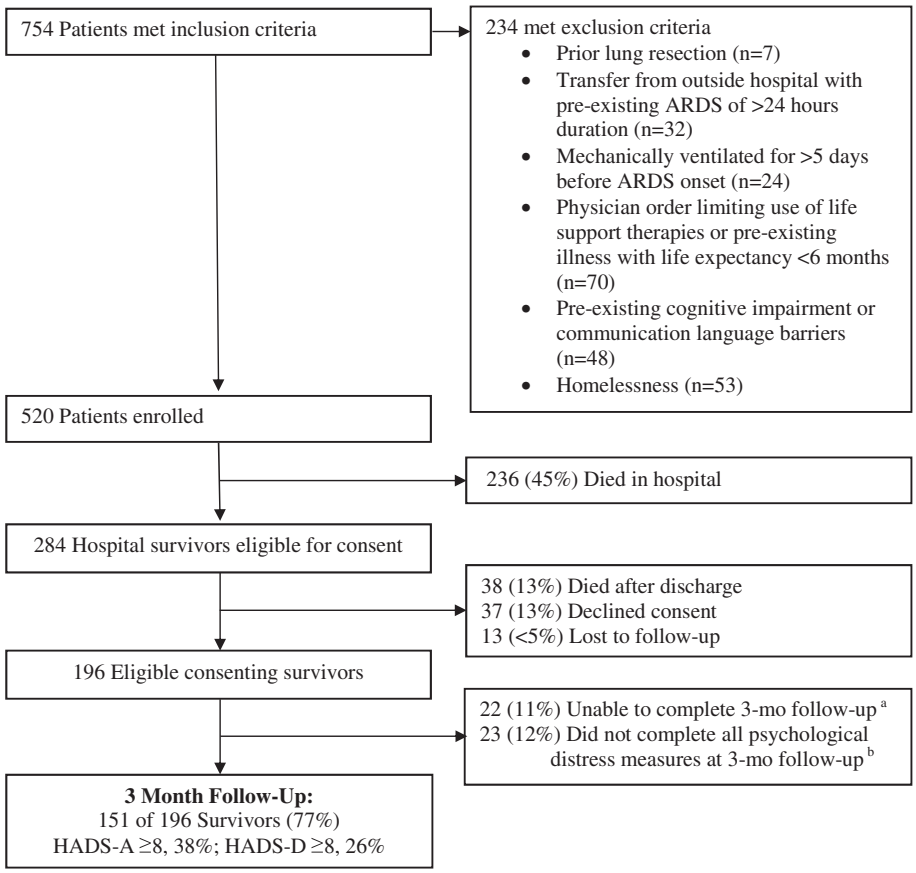

Fig. 1. Flow diagram of study participants. Abbreviations: HADS, Hospital Anxiety and Depression Scale; HADS-A, Anxiety subscale; HADS-D, Depression subscale. [a] Patients were unable to complete a 3-month follow-up visit for the following reasons: unable to locate participant (n=14), participant declined visit (n=4), cognitively or physically incapable (n=2), and other reasons (n=2). [b] Some patients had a follow-up visit, but did not have complete data for the following reasons: physically incapable (n=9), cognitively incapable (n=5) and other reasons (n=9).