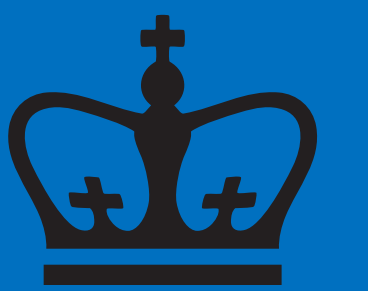


Remote Virtual Reality Exposure Therapy for Post-Intensive Care Syndrome

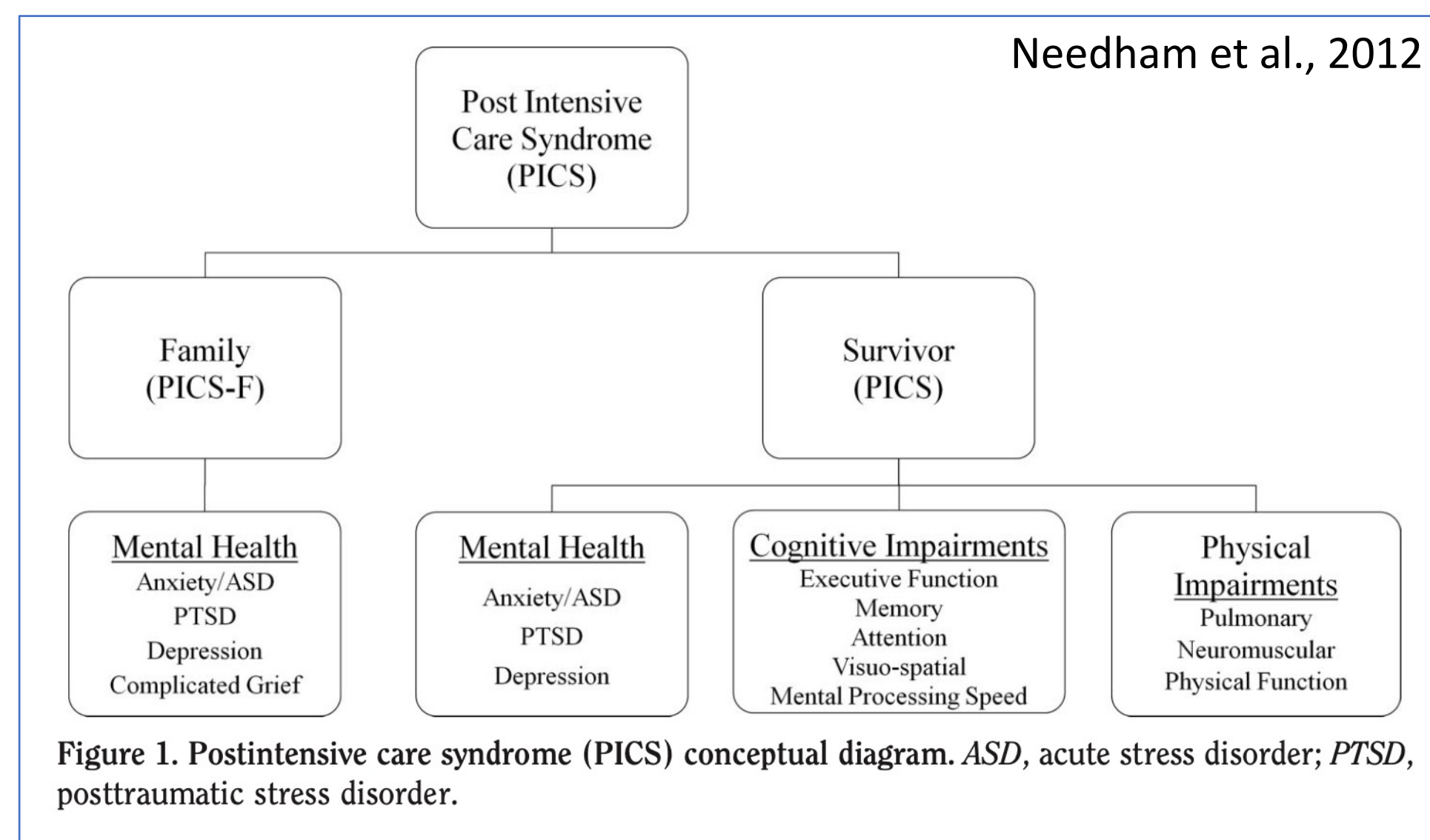
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No conflicts of interest

INTRODUCTION

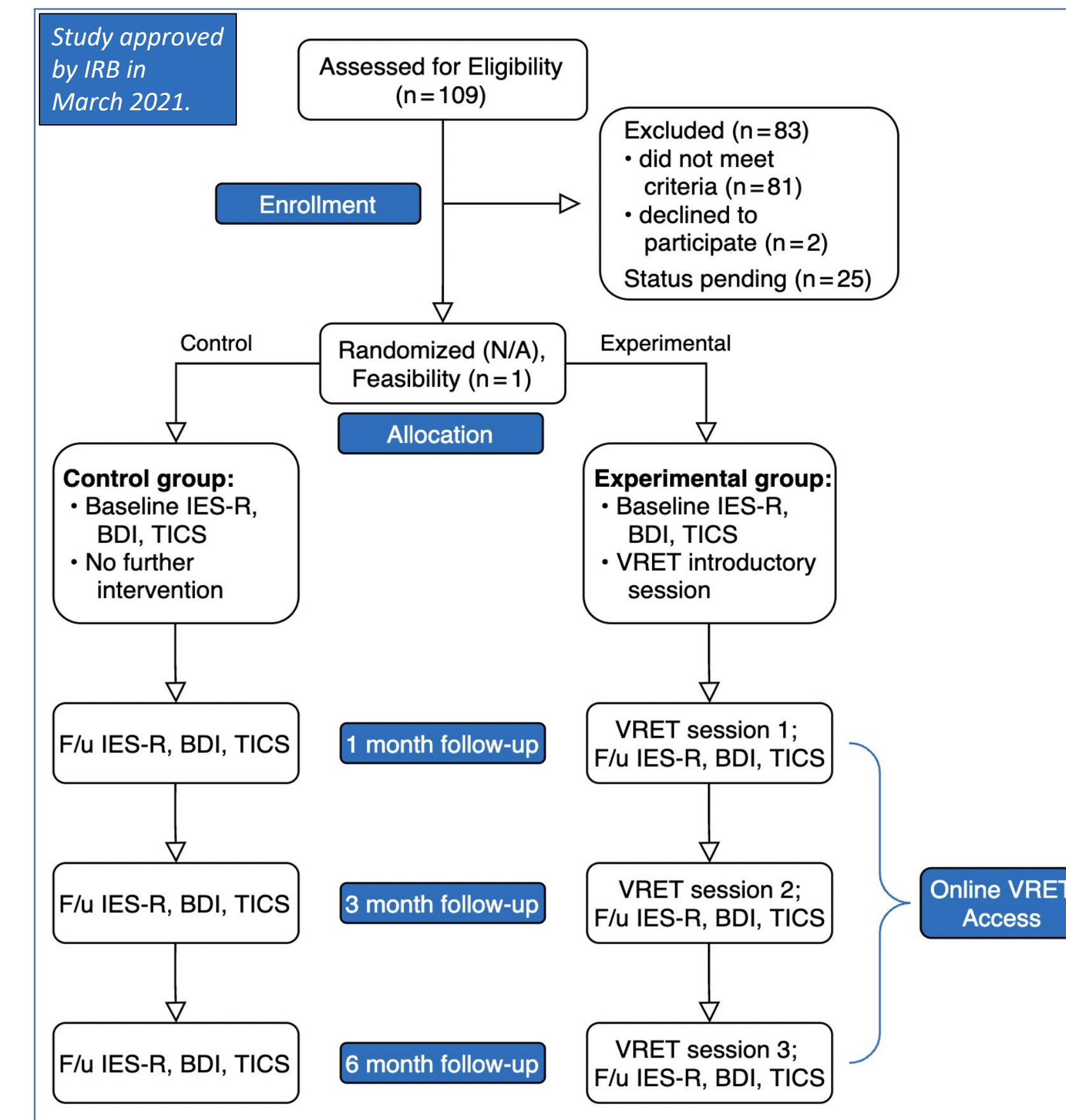
- Post-intensive care syndrome (PICS) defined as new or worsening impairment in physical, cognitive, or psychiatric health that results from critical illness and persists following discharge from intensive care.¹
 - **Physical symptoms** include myopathic and neuropathic weakness that impair performance of activities of daily living.
 - **Cognitive symptoms** are extremely prevalent, up to 78% incidence, and include deficits in memory, attention, and executive function.
 - **Psychiatric impairment** is seen in up to 67% of patients who survive an ICU admission; this includes depression, anxiety, and PTSD symptoms, each with an incidence of approximately 25%.
- PICS remains largely unrecognized and underdiagnosed, with no official diagnostic criteria, no established protocols for screening and testing, and no standard of care for management and treatment.²



- Virtual reality exposure therapy (VRET) represents a novel potential therapeutic modality for the psychiatric symptoms of PICS.
- VRET may be as effective as prolonged exposure (PE)³ for combat-related PTSD, social anxiety disorder, and specific phobias.⁴ This is the first trial to our knowledge exploring the use of remote VRET for psychiatric sequelae of PICS.
- Online, remotely-delivered VRET may enable ICU survivors to connect with treatment amid increased ICU admissions and a shortage of psychiatrists.

STUDY DESIGN

- Patients recruited from the neurological and medical ICU at Columbia University Irving Medical Center.
- Inclusion criteria:
 - ≥ 24 hours on mechanical ventilation
 - High risk for developing PTSD at discharge, as defined by IES-R score of 24–32
 - No pre-existing psychiatric diagnoses
- Patients assessed with baseline Beck Depression Index (BDI) and Telephone Interview for Cognitive Status (TICS).
- Patients randomized to receive VRET therapy or no treatment.



- Experimental group receives introductory VRET session shortly before discharge, followed by graded sessions at 1, 3, and 6 months. VRET consists of a 360-degree video of an ICU room, complete with monitor sounds and select clinical scenarios.
- VRET videos continue to be available to patients on YouTube until 6 months discharge.
- Both groups assessed with follow-up IES-R, BDI, and TICS questionnaires.
- Statistical analysis will:
 - Compare IES-R, BDI, and TICS scores between control and experimental groups
 - Track within-subject changes in outcome variables via ANOVA
 - Correlate amount of time spent using VRET with score changes via linear regression

RESEARCH AIMS

- Assess feasibility and offer a proof-of-concept study design for remote, accessible, and scalable VRET for the psychiatric components of post-intensive care syndrome.

CASE REVIEW

- Admitted and intubated for COVID-19
- Memories of ICU:
 - Preoccupied with delirious dreams
 - “I was a wolf,” “was in Egypt,” “was at sea”
 - In all dreams, “I wanted to get out”
- Symptom profile:
 - Intense emotions, difficulty sleeping
 - Predominantly frustration and anger
- Session 1:
 - Visible emotional reactions to monitors
 - Sounds from ICU incorporated into dreams
 - “Very helpful,” “Glad I wasn’t crazy”
- Further sessions:
 - Increased stress about COVID-19
 - Anxiety at beginning of video sessions that decreased with further exposure time
 - Desire to leave thoughts of ICU stay behind

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