

Considerations for Acute and Emergent Deployed Mental Health Patient Management and Theater Transports: A Scoping Review

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ABSTRACT

Background:

Although combat stress and psychiatric casualties of war have consistently contributed to the need for deployed patient transport to higher echelons of care, little is known regarding specific evidence-based strategies for providing psychological support and optimal transport interventions for warriors.

Study Objective:

The purpose of this scoping review is to map existing literature related to considerations for deployed mental health patient transport. The review's primary aims are to identify the existing scientific research evidence, determine research and training gaps, and recommend critical areas for future military research.

Methods:

We used Arksey and O'Malley's six-stage scoping review methodological framework (identify the research question, identify relevant studies, select studies, chart data, report results, and consultation). Using a systematic search strategy, we evaluated peer-reviewed literature from five databases (PubMed, CINAHL, PsycINFO, Web of Science, and Embase) and gray literature from the Defense Technical Information Center. All publications were independently screened for eligibility by two researchers during three review rounds (title, abstract, and full text).

Results:

We identified 1,384 publications, 61 of which met our inclusion criteria. Most publications and technical reports were level IV evidence and below, primarily retrospective cohort studies and epidemiologic surveillance reports. Few rigorously designed studies were identified. Eight research themes and a variety of research and critical training gaps were derived from the reviewed literature. Themes included (1) characterizing mental health patients aeromedically evacuated from theater; (2) in-flight sedation medications; (3) need for aeromedical evacuation (AE) in-theater education, training, and guidelines for staff; (4) epidemiological surveillance of AE from theater; (5) mental health management in deployed settings; (6) suicide-related event management; (7) transport issues for mental health patients; and (8) psychological stressors of AE. Research is needed to establish clinical practice guidelines for mental health condition management in theater and throughout the continuum of en route care.

BACKGROUND

While the U.S. military has experienced a significant reduction in combat operations over the past decade, there remains a steady presence of active duty service members (ADSMs) deployed to support operations worldwide. Medical care in deployed environments focus on stabilizing ADSMs at the point of injury and transporting them to the next available level of care, which often results in a minimum of five or more handoffs between the point of injury medical teams, aeromedical evacuation (AE) crews, and the final U.S. medical facility location. With the decrease in combat operations, deployed theater AEs shifted from primarily battle injuries (e.g., combat trauma/blasts/gunshot wounds) to non-battle injuries (e.g., musculoskeletal, gastrointestinal, and poisoning), with a notable transition from non-battle "physical" injuries to increased "mental injuries." Over the past decade, psychiatric conditions (e.g., adjustment disorders, anxiety, mood disorders, and substance abuse) consistently ranked in the top three and, more often, as the number one reason for U.S. Central Command theater evacuations.¹⁻⁴ While there is a robust body of combat casualty care research, joint trauma clinical practice guidelines (CPGs), and improved clinical

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outcomes for physical combat injuries, comparable guidelines and considerations for combat psychological health management are lacking. Conducting a comprehensive review of in-theater mental health patient transport considerations is essential to develop guidelines informing evidence-based care during deployment and medical evacuations (medevacs). A synthesis of current evidence is particularly useful for military nurses who are instrumental in developing and delivering mental health programs and policies that address the continuum of care from pre-deployment through transitions in and out of theater.

The Joint Trauma System (JTS), DoD Center of Excellence for Trauma, is a performance improvement organization dedicated to reducing morbidity and mortality and optimizing patient care from injury to return-to-duty. Moreover, JTS leaders leverage subject matter expertise and data resources to systematically develop and maintain CPGs in response to identified military needs. As of March 2020, JTS has published CPGs focused on the following: trauma (46), prolonged field and en route care (13), critical care air transport (3), and care of military working dogs (2).⁵ However, there is a paucity of research to inform CPG development regarding evidence-based prevention and intervention strategies for managing and transporting deployed ADSMs suffering from acute psychological trauma or injuries. Although there are four U.S. Department of Veterans Affairs DoD mental health CPGs (e.g., suicide, depression, post-traumatic stress disorder, and substance use disorder), none address acute mental health considerations in theater or during en route care (e.g., AE, casualty evacuation, or medevac)⁶ despite evidence of increasing theater psychiatric patient evacuations.⁷

Service Branch Instructions and Regulations

In the absence of clinical guidance, we explored service branch instructions for managing acute mental health conditions and theater transport considerations for deployed environments. Army publications provide limited guidance for psychological support in theater and during transport. Field Manual 4-02 Army Health System guides medical functions and procedures essential for operations and identifies ADSM combat and operational stress control support as a theater resource. However, these resources provide no detailed guidance for patient transport or care. Army Techniques Publication 4-02.10 Theater Hospitalization provides a doctrinal foundation and guidance related to medical care in theater, including organization design, mission, capabilities, rules of allocation, and mobility.⁸ Army Techniques Publication 4-02.10 briefly discusses psychological stressors as a health threat to ADSMs but does not provide patient guidance. Army Techniques Publication 4-02.2 Medical Evacuation contains information concerning the roles of care necessary to sustain the patient during transport but notes that there are no mental health capabilities in the en route patient staging system.⁹

Navy instructions guiding patient transportation for ADSMs experiencing mental health concerns requiring patient transportation and movement from deployed locations are limited. The Department of the Navy (2013) guidance available in publications Navy Tactics, Techniques, and Procedures (NTTP) 4-02.2M and Marine Corps Reference Publication (MCRP) 3-40A.7 includes nonspecific language regarding the use of “watch” during patient movement; however, it provides no specific instructions that guide “watch” duties specifically for reasons of patient mental health medevacs.¹⁰ Similarly, the DoD Instruction 6490.12 addresses mental health evacuations of military ADSMs that include limited language guiding transportation of an ADSM exhibiting dangerous behavior. The DoD Instruction includes prioritization of safety precautions and clear communication between the commander/supervisor and the mental health provider regarding the patient’s condition during emergency evacuation planning and during the en route period.¹¹

The Mental Health Air Force Instruction (AFI) (AFI 44-172) focuses on CONUS operations; however, we identified the following relevant clinical considerations: (1) mobility restrictions and duty limiting conditions, (2) deployment mental health clearances, (3) transporting patients in crisis, and (4) clinical management of suicidal patients, which focuses on pre-deployment screenings and administrative procedures or CONUS crisis administrative procedures.¹² Of interest and relevant to our review findings, the current AFI 44-172, 2.14.1.2 (p. 22-23) states,

Members with a psychiatric disorder (excluding those in paragraph 2.12.3 above) in remission or whose residual symptoms do not impair duty performance may be considered for deployment duties if they have demonstrated a pattern of stability without significant symptoms for at least three months prior to deployment.¹²

Instructions on En Route Care and Aeromedical Evacuation Medical Operations,¹³⁻¹⁵ Aeromedical Evacuation Air Force Tactics, Techniques, and Procedures (AFTTP) (AFTTP 3-42.5), and the En Route Patient Staging System (AFTTP 3-42.57) provide more detailed procedural information including transport classification for psychiatric patients, mode of transport descriptions (e.g., litter and ambulatory), indications for medical and non-medical attendants, use of physical restraints and sedation medications, wear of travel garments (e.g., pajamas and physical training gear), and aircraft positioning of mental health patients concerning emergency exits and O₂ shut-offs. Detailed descriptions of preflight and inflight care and stressors of flight for mental health patients are outlined in AFI 48-307v1,¹³ along with AE protocol (“Clinical Protocols for the Acute Exacerbation of Mental Health/Behavior Disorders”).

It is unclear if service recommendations are based on evidence or if there is adequate evidence in the literature to

develop a deployment behavioral health CPG. Regardless, relevant content from the service instructions may provide a framework or contribute to creating a joint service CPG on management and transport of acute deployed psychological injuries/conditions. Given the unknown state of the science, a scoping review was indicated and conducted.

Scoping Review Objectives

Scoping reviews function as literature reconnaissance and provide broad characteristics on bodies of literature.¹⁶ Arksey and O'Malley's six-stage methodological framework served as our step-by-step guide: (1) identify the research question; (2) identify relevant studies; (3) study selection; (4) charting the data; (5) collating, summarizing, and reporting results; and (6) consultation.¹⁷ The purpose of our review was to assess and map the quality and quantity of evidence regarding considerations specific to deployed military members emergently transported out of theater due to mental health crises.

Step 1: Identify the Research Questions

Our primary aims addressed the following research questions: What is the state of the science (breadth, depth, and quality of literature) addressing evidence-based considerations for acute or emergent mental health patient transports out of deployed locations? What research and training gaps were suggested in the literature to improve the quality of acute mental health en route care?

METHOD

Step 2: Identify Relevant Studies

Using a comprehensive and iterative search strategy guided by a university medical librarian, we searched PubMed, CINAHL, PsycINFO, Web of Science, and Embase, and gray literature from the Defense Technical Information Center (DTIC). We conducted the review in three search phases: Phase I, peer-reviewed publications from the listed databases; Phase II, targeted hand-searched reference lists from Phase I retained publications; and Phase III, explored gray literature in DTIC's database of government technical reports. We searched databases for English language literature published between 1970 and 2019. Although specific search string construction varied by database, the search terms included descriptions of emergent transport (patient transport, emergency transport, critical care air transport, AE, medevac, trauma transport, patient movement, inter-facility transport, and inter-theater transport) and emergent mental health descriptors (suicide, combat stress, acute traumatic stress, psychiatric emergency, mental health disorder, behavioral health emergency, psychological distress, and acute distress).

Step 3: Study Selection

To ensure transparent reporting and assist with replicability, we used the Preferred Reporting Items for Systematic

Reviews and Meta-Analyses (PRISMA) statement to design and complete our review.¹⁸ We independently screened all studies for eligibility during each review phase, with six researchers working in pairs during three review rounds (title, abstract, and full text). We included studies focusing on the care of mental health patients throughout the continuum of theater transport (in theater, in transit, in any role 1-4 facility, and en route to CONUS), and literature with psychological/behavioral health patient transport focus. We excluded publications with a primary focus on children, geriatrics, intellectual disabilities, bariatrics, pediatrics, nursing homes, the elderly, prisoners, and aeromedical crew and staging staff. We resolved disagreements regarding study selection through third-party review and team discussion until we gained consensus.

Step 4: Charting the Data

Covidence systematic review software (Veritas Health Innovation, Melbourne, Australia) aided Phase I (peer-reviewed literature) citation importing, screening, and full-text review processes. Phase II (hand search) and Phase III (gray literature) were managed manually with a structured data abstraction form due to limitations with gray literature database functionality. Reviewers entered all data into a master database to include the following extraction variables: author, title, purpose, sample size, participant characteristics, country, design, methods, intervention, outcome variables, main findings, research, and training gaps noted by authors. The retained full-text publications ($n = 61$) were systematically and critically appraised independently by each researcher for level and quality of evidence with Melnyk and Fineout-Overholt's (2011) rapid critical appraisal tools. Two researchers deconflicted appraisal disagreements to reach complete concordance for all selected publications during each review phase.

RESULTS

Step 5: Collating, Summarizing, and Reporting Results

Database searches produced 1,322 citations with an additional 62 references identified in hand search of those references listed. We removed 345 duplicates and screened 1,039 titles for inclusion. A review of titles and abstracts resulted in the exclusion of 934 references; the remaining 105 full texts were further assessed. Of those, 44 articles were excluded for reasons including lack of relevance (18), being a regulation or instruction (8), additional content duplication (7), missing target population (5), obsolete information (4), or being an abstract of an oral presentation (2). After several rounds of review by at least two researchers and a final assessment of applicability, we included 61 articles for analysis (see Fig. 1 PRISMA flowchart).

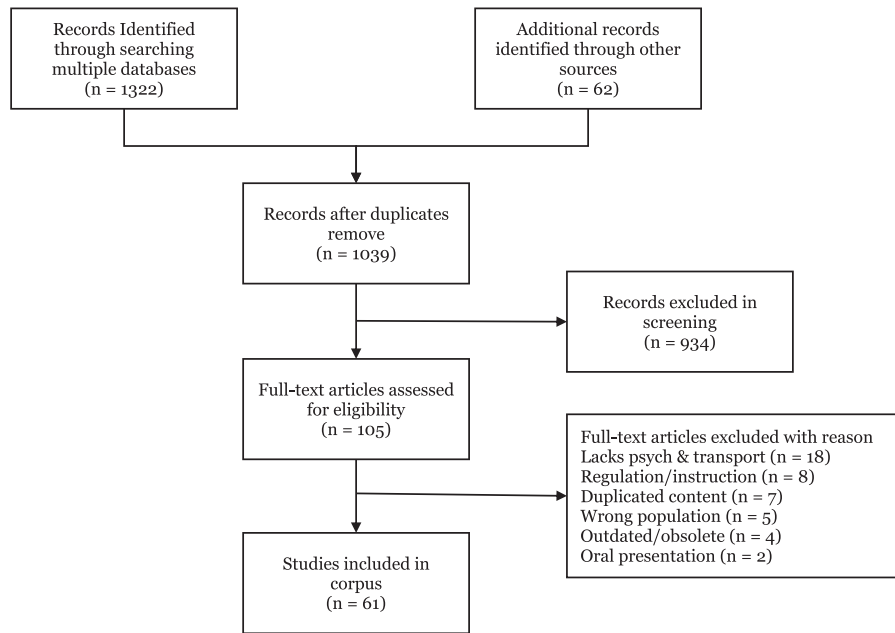


FIGURE 1. Scoping review Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart.

Study Characteristics

The body of literature lacked high-level evidence and was comprised of thirty (49% of the sample) level IV case-control or cohort studies, three (5%) level V systematic reviews of qualitative or descriptive studies, 20 (33%) level VI qualitative/descriptive studies, and 8 (13%) expert opinions. Within the corpus of articles, induced themes were discovered by open coding in which two researchers evaluated texts for repetition, similarities, and differences, and remaining team members analyzed, reviewed, and summarized the preliminary themes independently and then in aggregate. The team reached a consensus on eight identified themes (Fig. 2) discussed in detail below in order of prevalence. Additionally, Fig. 3 provides an illustrative representation of scoping review articles by service branch and a comprehensive table of all literature can be found in Supplemental Materials.

This is mentioning the Supplemental Material: Considerations for Acute and Emergent Deployed Mental Health Patient Management and Theater Transports: A Scoping Review Comprehensive Scoping Review Table

Scoping Review Themes

Theme 1: Characterizing Mental Health Patients Aeromedically Evacuated from Theater

The primary purpose of 31% ($n = 19$) of review articles was to describe the characteristics of patients evacuated from a deployed setting.^{7,19–35} Studies revealed that typically young, male, Army enlisted,^{7,24,29,31,33,34,36} first-time deployers²⁹ described most psychiatric AE patients, who were most often categorized by patient movement precedent code of Routine^{20,28} (vs. Priority or Urgent)

AEs. Frequently, patients had a history of mental health condition^{23,25,35} and were seen within 6 months of deploying. The most common AE diagnoses included adjustment disorder, depression, anxiety, personality disorder, and PTSD.^{7,19,20,22,23,28,29,35} Despite more males were transported out of theater, there was an overrepresentation of females and ethnic minorities.³⁶ Suicide-related events were common^{20,21,23} and individuals evacuated for mental health diagnoses were four times more likely to be discharged or separated upon returning home, as compared to medical AE patients.^{7,20}

Theme 2: In-flight Sedation Medications

Publications focused on in-flight sedation constituted 20% ($n = 12$) of review articles.^{30,37–47} Most studies focused on ketamine, exploring the effectiveness and adverse effects such as the need for intubation (9/12 articles).^{37,39–43,45–47} A single study recommended Haldol (10 mg IM, 17 minutes to onset) over ketamine (5 mg/kg intermuscular (IM), 5 minutes to onset) due to less adverse effects (5% vs. 49% respectively) and fewer intubations (4% vs. 39% respectively).³⁹ Common adverse effects from ketamine, noted across studies, were hypertension, hypoxia, increased secretions,⁴⁰ and the need for intubation.^{37,39,41} Preflight sedation (oral/intravenous) was recommended^{41,48} instead of in-flight sedation, and propofol was suggested as an alternative sedative.³⁸ While ketamine was frequently recommended as safe, there was no agreement on minimum effective dosage or standard safety protocols despite recommendations for a clinical sedation guideline.^{42,45} Researchers from a single study demonstrated

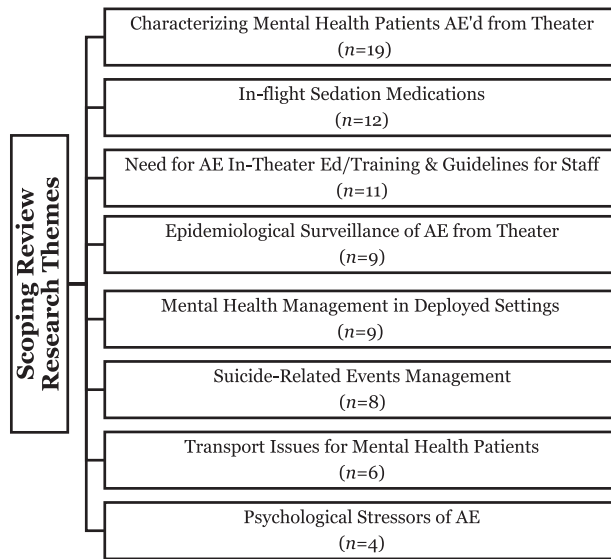


FIGURE 2. Research themes. Eight research themes imparted from the review of literature.

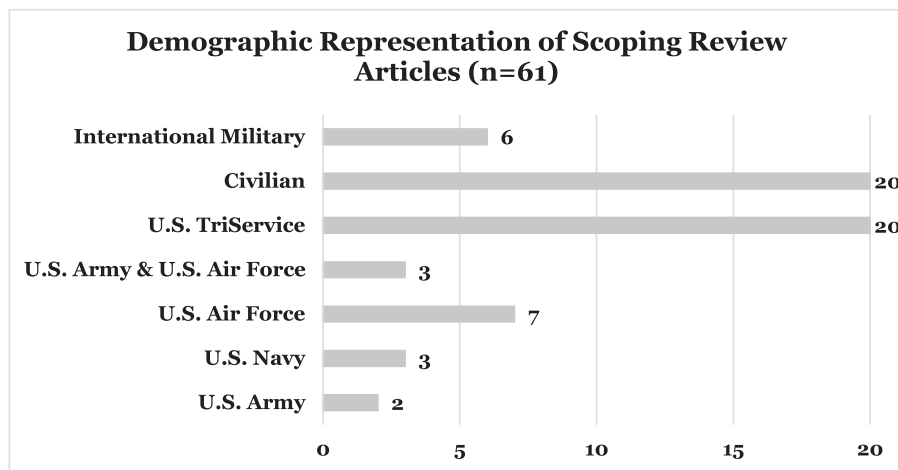


FIGURE 3. Demographic representation of scoping review articles by service branch.

U.S. Tri-service constitutes members of the U.S. Army, U.S. Navy, and U.S. Air Force. International Military is comprised of German, U.K., Australian, Canadian, French, and Israeli Forces. Civilian refers to U.S. and international studies of civilian research populations.

an association between ketamine and decreased intubations after implementation of an Australian ketamine sedation guideline for acute psychiatric patients aeromedically evacuated to definitive care.⁴⁵

Theme 3: Need for Education/Training/Guidelines/Protocols for AE and in Theater Staff

Researchers address the need for education and training, standard guidelines, and protocols for managing mental health patients in deployed and transport environments in 11 articles (18%).^{19,23,27,43,45,49-54} These studies found or suggested that guidelines and protocols decrease safety issues

and adverse outcomes^{19,23,24,45,50,54,55} and that specific practice models and clear roles for deployed mental health staff potentially contribute to improved outcomes.²⁷ Study conclusions advocate for utilizing experienced mental health staff for emergency management. Didactic and hands-on training is recommended for flight surgeons,⁵² psychologists,⁵³ and all staff caring for the diverse needs of acutely ill deployed mental health patients.^{23,49} One particularly critical topic is “Unit Watch,” a task typically delegated for a “battle buddy” to watch over active duty members who are suicidal while they await professional intervention, which in deployed settings may take days before members are handed-off to mental health providers. Currently, there is no standard training for

watch members on identifying suicidal ideation or in basic management of suicidal patients.^{55,56}

Theme 4: Epidemiologic Surveillance of AE from Theater

The Armed Forces Health Surveillance Branch's Medical Surveillance Monthly Reports (MSMRs) annually feature a summary of disease burden and rates of AE from theater, primarily from the U.S. Central Command. Seven of the nine epidemiologic surveillance articles were MSMRs describing psychiatric AE rates during operations Iraqi Freedom, Enduring Freedom, and New Dawn.^{1-4,21,32,57-60} The rates of AE from theater fluctuated over the decades, rising with associated mission activity. Psychological AEs increased by 50% from a rate of 6-9% in 2001-2005 to 16% by 2009⁵⁷ with a peak of 28% during 2018.⁴ Disease and conditions for AEs follow the 18 illness/injury categories based on International Classification of Diseases (ICD-9/10-CM) diagnostic codes reported on medical records post-evacuation. Top mental health AE diagnoses aligned with findings from articles characterizing AE patients: adjustment disorders, depression, mood disorders, anxiety, and PTSD.

Theme 5: Mental Health Management in Deployed Settings

A total of nine articles included content related to mental health management in deployed settings.^{19,27,53,61-66} A review by Glass (1954) was retained, despite its age, due to the extraordinary relevance and timelessness of the contents, which recounts the evolution of frontline psychiatry and novel strategies to prevent massive mental health evacuations through combat operational stress treatment principles of: brevity, immediacy, centrality, expectancy, and proximity (BICEP), a mainstay of current in-theater management.⁶¹ Similarly, a recent exhaustive three-part review by Russell and Figley (2017) discussed the role of deployed mental health providers, as a primary administrative function, returning as many patients to duty as possible to prevent mission degradation; the Command approving only the most severe patients for psychiatric evacuation.^{64,67,68} The authors go on to question the clinical effectiveness and value of frontline psychiatry with regard to the long-term health of ADSMs experiencing mental health conditions in theater.^{64,67,68} The remaining publications focused on actionable strategies for improving the delivery of mental health services in theater, such as utilizing a mental health liaison to be able to speak command language and understand the culture of mission-first mentality, maintaining manpower resources, and communicating mental health needs of acute patients effectively.⁶³ Several authors advocated for embedded mental health staff,⁶⁶ specific practice models and inpatient consultations,²⁷ potential benefits of deploying psychiatric mental health nurse practitioners,²⁷ the concept of stabilizing mental health patients for 3-7 days before transport,⁷ and standardized operational CPG definitions to decrease variance in diagnostic criteria.¹⁹

Theme 6: Suicide-Related Events Management

Publications contributing to the theme of suicide-related events management ($n = 8$)^{21,22,25,32,55,62,69,70} confirmed that the most severe mental health AEs are for suicidal ideation and suicidal gestures,^{7,22} that self-harm is the strongest predictor for AE,²⁵ and that self-harm is a serious contributor to in-theater mortality.^{21,32,70} Furthermore, epidemiologic surveillance methodology may not accurately capture the true burden of mental illness on AE and the military health system due to some suicides and suicide attempts coded as injury/poisonings per ICD-9/10 coding conventions.

Suicide prevention measures listed in the literature include removing weapons from suicidal members and using "unit watch" as short-term strategy until members arrive at definitive care in a safe environment. Most suicide-related events result in AE out of theater, an optimal immediate solution but not without consequences of stigma and career consequences for service members.⁵⁵

Theme 7: Transport of Mental Health Patients

Literature addressing the transport of mental health patients, a total of six articles,^{54,69,71-74} recommend employing experienced and adequately trained staff,^{69,72} using in-flight emergency kits, checklists, and emergency protocols with dedicated roles and responsibilities for management of acute mental health patients in-flight.^{54,69,74} Of special note is a reminder not to attempt transport for substance abuse patients until individuals are adequately recovered from the initial detoxification.^{69,71,73}

Theme 8: Psychological Stressors of AE

Four publications acknowledge that the transport experience in and out of theater imparts psychological stress^{49,75-77} and that all patients evacuated from theater, regardless of diagnosis, suffer psychological stressors.^{49,77} Researchers report suggested strategies for identifying mental health issues (e.g., fear of flying and substance abuse; specific diagnoses) preflight and providing in-flight supportive therapy to reduce the psychological stressors of AE.

Scoping Review Research and Training Gaps

In addition to the themes derived from the literature, we also evaluated articles to characterize author-recommended research or training gaps, which are illustrated in [Table I](#). We used the deployment cycle (e.g., pre-deployment, in theater, in transit, and post-deployment) as an organizing framework to display the identified research and training gaps. While research is needed throughout all phases of the deployment cycle, our body of literature noted more recommendations for researching in-theater and in-transit mental health variables and outcomes. Training gaps, constituting less than a quarter of the overall gaps, primarily focus on the need for all medics

TABLE I. Noted Research and Training Gaps

Research gaps				
Variables	Pre-deployment	In theater	In transit	Post-deployment
External		- Operational - Leadership - Group cohesion - Field conditions		- Comparative analysis of warzone and MH casualties
Patient	- MH risk factors - Past MH history - Previous MH visits - Violence history - Modifiable risk factors - Physical comorbidities	- Reasons for depression - Depression link to suicide - MH and physical comorbidities - Family support and deployer MH	- Characterize and quantify MH stress levels for all AE patients	- Common characteristics of AE MH patients
Intervention		- Ketamine sedation for acute psychotic patient: safe dosage, rate of intubation and adverse effects for acute use with propofol; weight-based dosing, and frequency of use		
Deployment CPGs	- BICEP and “frontline psychiatry” effectiveness for immediate/long-term MH outcomes - Acute management of psychotic patients in deployed environment - Management of PTSD in deployed environments - Management of suicidal patients in deployed environment - Management of mental health injuries in a deployed environment - Postvention in a deployed environment			
Health services management		- MH triage	- Increased use of MH staff for AE - MH safety gaps during AE	- Retrospective analysis of deployment phase variables in MH AE patients
Training gaps				
Staff training	- Standardized staff training for PTSD symptom/screening - Training curriculum on hospital and AE procedures for psychologists	- Crisis intervention training for general healthcare staff - MH training for peers assigned to “unit watch” for suicidal patients	- MH training for nonmedical attendants - Crisis intervention training for AE and staging staff	

Research and training gaps identified by deployment phase.

Abbreviations: AE, aeromedical evacuation; BICEP, brevity, immediacy, centrality, expectancy, and proximity; CPG, clinical practice guideline; MH, mental health.

to receive specialized training regarding: how to care for mental health patients in theater, during transport, and specifically for suicidal and acutely agitated patients.

review findings to validate the results and provide insights beyond those found in the literature. Each service branch SME described prevalent mental health transport vulnerabilities and provided vital feedback to inform future research.

SYNTHESIS OF RESULTS

Step 6: Consultation

Mental health and en route care subject matter experts (SMEs) from each of the service branches reviewed our scoping

Air Force

Mental health, AE, and training curriculum SMEs evaluated gaps and themes. Although much remains to be studied,

training gaps for “unit watch” and crisis intervention training are narrowing. Members tasked to stand wingman watch (“unit watch”) for suicidal deployers are now trained using a standardized “Wingman Plus,” squadron level training program. Crisis intervention training needs are being addressed through updated training protocols and live simulation scenarios for managing acute mental health exacerbations (combat stress, anxiety, and delirium management) in most courses, but would benefit from being added to all pre-deployment clinical training courses. A team of psychological scientists is currently investigating modified prolonged exposure and cognitive processing therapies for austere environments, a noted research gap. Finally, leaders should consider the contributory factors of family and gender in future research agendas.

Navy

There are no specific U.S. Navy instructions that guide the transport of patients who are diagnosed with psychiatric/mental health diagnoses requiring medevac. The required expertise regarding medevac escorts is limited to chain-of-command and rank. Additional research is necessary to inform robust and actionable CPGs that include all platforms (land and water-based). Future research should focus on utilizing short-term, in-transit sedation, and management for agitated patients during transport. Additionally, investigators should consider virtual telehealth for future research endeavors in the prevention of medevacs for assessment and care. Exploring required escort training and communication expectations is needed to focus on the sending and receiving facilities and management measures to prevent bad outcomes during transit.

Army

Subject matter experts recommend research on the effectiveness of Combat Operational Stress Control units, appropriate use of in-transit sedation medication protocols, and refinement of pre-deployment health assessments to decrease evacuation rates.

DISCUSSION

Summary of Evidence

The state of the science regarding redeployment and movement of military personnel diagnosed with psychiatric and mental health conditions is lacking. This is particularly concerning because diagnoses for deployed psychiatric/mental health conditions continue to be the primary reason for ADSM medevac from theater. Published literature reveals a majority of cohort, surveillance, and descriptive research. There is a strong consensus regarding the characteristics of patients evacuated from deployed settings and the increasing rates of psychological evacuations despite decreasing combat operations. Suggestions for better pre-deployment mental health screenings are lost without actionable steps to support high-risk members during deployment or defer deployments for

members with recent mental health concerns until a more stable mental health status is attained. There is little scientific evidence regarding specific biobehavioral interventions for early detection, prevention, or mitigation of deployed psychological health stressors. Despite lacking evidence, there is a consistent demand for training programs focused on resilience, stress management, psychological first aid, suicide prevention, and management of mental health emergencies for both medical and non-medical staff. Our scoping review results provide a preliminary framework and gap inventory to develop research and training curriculum agenda. Moreover, the review findings may establish the basis for developing an in-theater psychological health CPG.

Subsequently, the absence of strong empirical evidence contributes to the noted inconsistencies in policy and standards for managing mental health emergencies and deployed patient evacuations across services. This article recommends the development of evidence-based joint doctrine along with a joint CPG for the provision of psychological healthcare in deployed environments.

Limitations

Limitations for scoping reviews apply to this study; this report does not include grading the quality of evidence nor formal synthesis. We used standardized and robust methods to identify published literature regarding acute and emergent mental health transport. We excluded non-English language studies and research investigating mental health transport considerations for en route care clinicians. Although we use the term “active duty service member” referring to the population of interest in the reviewed studies, we recognize that activated U.S. Guard and Reserve members are a significant portion of the ADSM deployed population and are included in this body of literature. Likewise, civilian contractors are also part of the deployed population; however, they do not evacuate emergently on U.S. military aircraft, they are evacuated via civilian international air ambulances and therefore are not included in this body of literature. Additionally, we reviewed literature with transportation in a deployed or remote environment as a requirement. Some aeromedical studies conducted in non-deployed environments may reveal important considerations for acute and emergent mental health. Furthermore, for acute mental health transports, distinctions between regulated (e.g., strategic evacuation or medevac) or unregulated (e.g., tactical evacuation or casualty evacuation) evacuations were beyond the scope of this article. There is also inevitable risk of selection bias associated with hand-searching; although 61 studies met inclusion criteria, they may not represent all relevant work in this field.

CONCLUSIONS

We identified research and training gaps throughout the continuum of en route care that, if addressed, could improve deployed mental health quality of care and patient outcomes. Research is needed to establish CPGs and protocols for theater

management, staging, and transport of acute and emergent mental health patients; for suicide-related event postvention; sedation and management of agitated patients during long-distance transport; training needs of deployed medical staff and peer unit watch protocols; and for evaluation of forward psychiatry effectiveness and long-term health impacts. Our scoping review provides a call to action for health care leaders to foster research and develop evidence-based interventions targeted to deployed military members' psychological health needs. This review provides a synthesis of the current research evidence regarding the management and transport of acute and emergent deployed mental health patients. Future investigators can use the results to develop interventions and CPGs that support the transport and management of deployed military psychological health needs.

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SUPPLEMENTARY MATERIAL

Supplementary material is available at *Military Medicine* online.

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CONFLICT OF INTEREST STATEMENT

None declared.

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