Prioritized Research Gaps Report for Adjustment Disorders CY 2018

Psychological Health Center of Excellence

March 2019

Released March 2019 by the Psychological Health Center of Excellence.
This product is reviewed annually and is current until superseded.
301-295-7681 | pdhealth.mil

Submitted to

Defense Health Agency
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Acknowledgements

The Psychological Health Center of Excellence would like to thank Ms. Jessica Castro for her significant assistance during the 2018 research gap identification process.

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Executive Summary

Background. Since 2016, the Psychological Health Center of Excellence (PHCoE) has conducted an annual analysis of research gaps within psychological health topics of current and pressing relevance to the Department of Defense (DoD). PHCoE has developed a systematic methodology for producing a list of prioritized research gaps from a collection of research-needs statements. Elements of this methodology include stakeholder input at key decision points, comprehensive reviews of authoritative source reports, in-depth analysis of published research, and scans of in-progress research reports and descriptions.

In 2018, PHCoE focused the research gap prioritization effort on the topic of adjustment disorders. Adjustment disorders are the most commonly diagnosed group of mental health disorders in active duty Service members (ADSMs), with a reported 2017 prevalence rate of 7.1% (PHCoE, unpublished analysis of data from the Military Health System Data Repository, May 2018). For comparison, the prevalence rate of ADSMs diagnosed with posttraumatic stress disorder (PTSD) was 2.1%. Adjustment disorders are characterized by clinically significant emotional and behavioral symptoms in reaction to a recent and identifiable stressor such that the distress is out of proportion to the stressor, and/or the individual has difficulty functioning in a social, occupational, or other important context (American Psychiatric Association [APA], 2013).

The primary aim of this report is to provide DoD stakeholders with pertinent information that may help prioritize future research investments that focus on adjustment disorders. We also describe the methodology used for identifying and prioritizing research gaps.

Method. PHCoE convened a workgroup of 12 subject-matter experts in military psychological health research, clinical care, and research methodology. To select the topic of the 2018 research gaps analysis, the workgroup first consulted authoritative source reports, surveillance data, and Military Health System (MHS) stakeholders, and generated a list of psychological health topics for which additional research would be important and feasible to pursue within the military. The list of topics was further reviewed and prioritized by a group of MHS stakeholders, and adjustment disorders were rated as having the highest potential to inform care in the MHS. Accordingly, the topic of adjustment disorders was adopted for the 2018 PHCoE gaps analysis.

For the first phase of gaps analysis within adjustment disorders research, the PHCoE workgroup examined authoritative source reports and literature reviews on adjustment disorders in order to identify research-needs statements. A total of 254 statements was identified and then refined into 26 potential research gaps. In the next phase of analysis, a second group of MHS stakeholders rated each of the 26 gaps for its importance in improving the health and readiness of ADSM and MHS beneficiaries. The workgroup conducted reviews of the published scientific literature and in-progress research on the 19 potential gaps receiving a rating of moderate or higher importance by stakeholders. Based on the findings of the reviews, the workgroup met and chose to either retain, revise, or remove each gap, which resulted in 11 final gaps. A third group of MHS stakeholder agencies rated each of the final gaps in order to prioritize them according to each gap's perceived importance in improving the health and readiness of ADSM and MHS beneficiaries.

Results. The prioritized list of adjustment disorder research gaps is presented in Table 1. The 11 gaps addressed topics within research categories covering foundational science, epidemiology, etiology, prevention and screening, treatment, follow-up care, and services research. The gap receiving the highest priority rating was, *"Develop and test the effectiveness of interventions that address reaction to the stressor in preventing adjustment disorders."* The next highest rated gap was, *"Elucidate the longitudinal trajectories of adjustment disorders (i.e., does it remit, become chronic, or change to a more severe diagnosis?)."*

Discussion. Adjustment disorders are a group of psychological health disorders for which relatively little research has been conducted despite being the most frequent mental health diagnosis in ADSMs. This effort to identify and prioritize gaps in adjustment disorders highlights the need for greater research investments into the adjustment disorders. In 2018, PHCoE addressed this need by applying its systematic gaps analysis methodology to generate a prioritized list of research gaps within the topic of adjustment disorders.

1.0 Background

1.1 Purpose

Health research priority setting is a process that experts and stakeholders use to identify and prioritize research gaps in order to ensure that resources are directed towards those studies with the greatest public health benefit, and which maximize the impact of investments made by funding agencies (Viergever, Olifson, Ghaffar, & Terry, 2010). Since 2016, the Psychological Health Center of Excellence (PHCoE) has conducted an annual research gaps analysis to identify and prioritize psychological health gaps of particular relevance to the Department of Defense (DoD). In 2016, the effort encompassed the prioritization of research gaps on posttraumatic stress disorder (PTSD) and depression (Otto et al., 2018). In 2017, PHCoE conducted the research gaps analysis on select topics within the broad domain of substance use disorder (SUD; Kelber et al., 2019).

In 2018, based on input from PHCoE and Military Health System (MHS) stakeholders, PHCoE focused the research gap prioritization effort on adjustment disorders. Adjustment disorders are the most commonly diagnosed mental health disorders in active duty Service members (ADSMs), with a reported 2017 prevalence rate of 7.1% (PHCoE, unpublished analysis of data from the MHS Data Repository, May 2018). Due to their high prevalence in the MHS, the health care burden is significant: the cost attributable to treatment of ADSMs diagnosed with adjustment disorder was approximately $242 million in 2017. In comparison, the prevalence rate of ADSMs diagnosed with posttraumatic stress disorder (PTSD) was 2.1% and the health care cost was approximately $206 million (PHCoE, unpublished analysis of data from the MHS Data Repository, May 2018).

The impact of adjustment disorders diagnoses on the military can also be seen through its association with early separations, hospitalizations, suicides, medical evacuations, and discharge by medical board. A study of 1680 US Air Force recruits revealed that 4.2% were separated for mental health related reasons within the first year of service, and adjustment disorder was the most frequent diagnosis (Englert, Hunter, & Sweeney, 2003). The 2017 rate of hospitalizations for adjustment disorders was 6.9 per 100 diagnosed patients (compared to 6.6 per 100 diagnosed patients for PTSD; PHCoE, unpublished analysis of data from the MHS Data Repository, May 2018). The DoD Suicide Event Report stated that of the 299 individuals who died by suicide in 2016, adjustment disorder was one of the most common diagnoses at 21.4% (Pruitt et al., 2018).

“Adjustment reaction” (ICD-9 term for adjustment disorder; World Health Organization [WHO], 1992) was the most frequent specific diagnosis for all medical evacuations during 2013–2015 (Williams, Stahlman, & Oh, 2017). Finally, while the most common psychiatric diagnosis for ADSMs who were medically boarded from the military from 2010 to 2015 was PTSD, adjustment disorder was the most common diagnosis for hospitalization of those evaluated for disability in the previous five year period (Walter Reed Army Institute of Research, 2015).

Adjustment disorders are characterized by clinically significant emotional and behavioral symptoms in reaction to a recent and identifiable stressor such that the distress is out of proportion to the stressor, or the individual has difficulty functioning in a social, occupational, or other important context (American Psychiatric Association [APA], 2013). The stressor may be a single event or the culmination of multiple events, and it may be recurrent or continuous. The lack of well-defined symptom and stressor criteria makes adjustment disorders easy to diagnose when a case conceptualization is incomplete or the patient has not met criteria for another disorder (Anastasia et al., 2016; Baumeister & Kufner, 2009; Casey, 2018a). Additionally, an adjustment disorder diagnosis might be recorded when a clinician is concerned that a diagnosis such as PTSD or major depressive disorder might have a negative impact on the patient (Wilk et al., 2016). Adjustment disorders typically have a good prognosis if the stressor is not persistent (APA, 2013). However, a recent study found that the majority of patients who had an adjustment disorder diagnosed at three months after a stressor occurred still had a mental health diagnosis at 12 months, which suggests that the adjustment disorders may portend a worse outcome than previously believed (O’Donnell et al., 2016).

Despite their relatively high prevalence and health care burden, adjustment disorders have received little attention by health researchers or policy analysts. This may be due, in part, to a lack of specific symptom criteria and their designation as sub-threshold disorders in the Diagnostic and Statistical Manual of Mental Disorders (DSM; APA, 2013). Adjustment disorders have six specifiers, or subtypes, in the DSM-5 and International Classification of Diseases version 10 (ICD-10; WHO, 2016) classification systems, that address depressed mood, anxiety, mixed anxiety and depressed mood, disturbance of conduct, mixed disturbance of emotions and conduct, and unspecified. Not surprisingly, adjustment disorders have considerable symptom overlap with major depressive disorder and generalized anxiety disorder (Casey, 2018b).

WHO sought to address some of these diagnostic complexities and released a draft version of the ICD-11 in 2012 with a markedly different, simplified definition of adjustment disorders. Subtypes were eliminated and two new major symptoms were proposed: preoccupation with the stressor, and failure to adapt. In turn, new screening and assessment tools were

constructed and have been field tested primarily in Europe, demonstrating good reliability and validity (Kazlauskas, Zelviene, & Lorenz, 2018). While a significant body of research has accumulated and shows promise, this new divergence in diagnostic criteria between the DSM-5 (APA, 2013) and ICD-11 (WHO, 2018) might pose difficulties in comparing results across studies and in reaching generalizable conclusions.

The primary aim of this report is to provide DoD stakeholders with information that may help prioritize future adjustment disorders research investments. We also describe the methodology used for identifying and prioritizing research gaps.

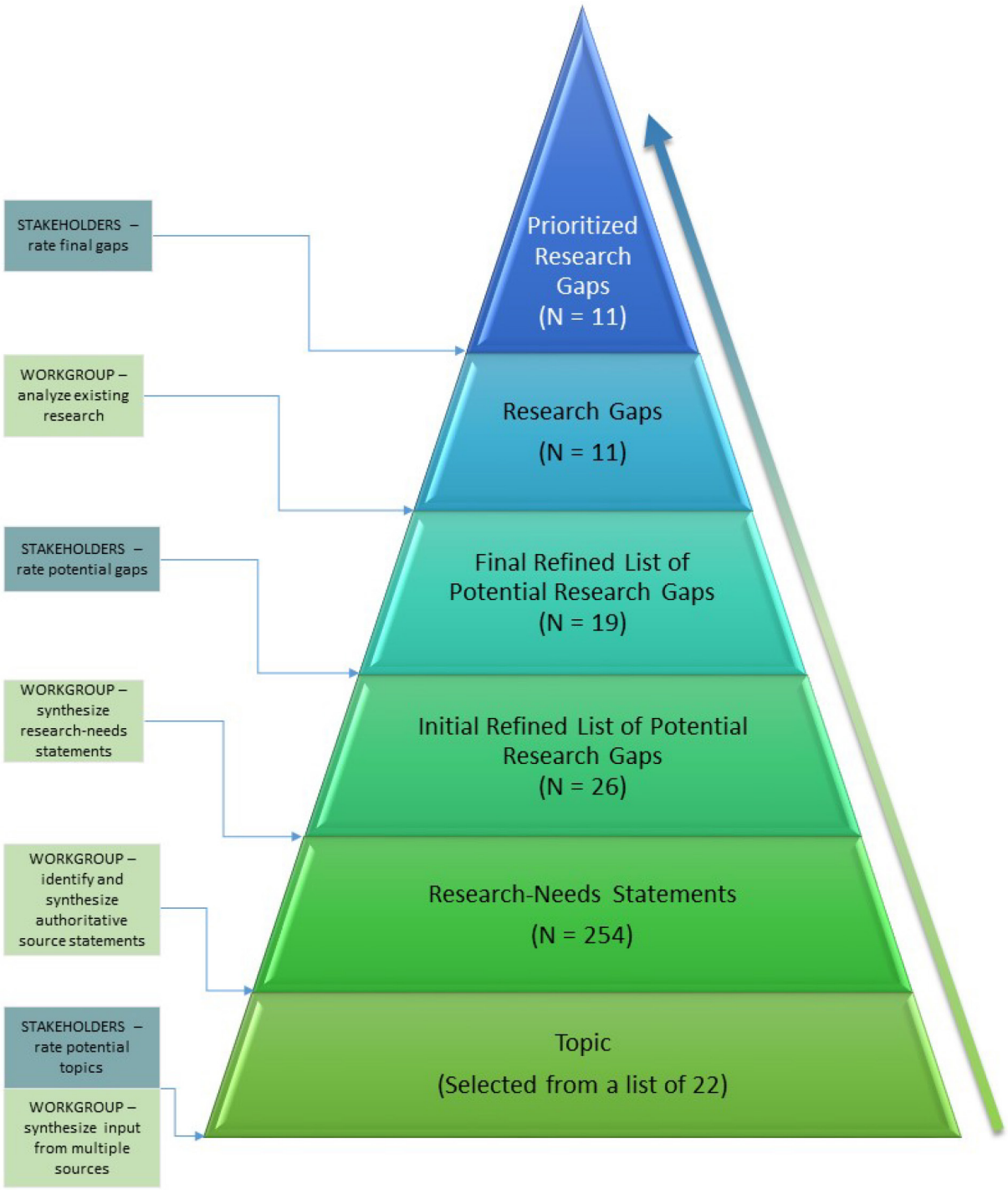
2.0 Method

PHCoE's approach for identifying research gaps included: 1) using authoritative source reports to identify gaps across a broad area of research, 2) having subject-matter experts conduct literature searches and review in-progress studies to substantiate gaps, and 3) engaging stakeholders at key decision points. These methods allow PHCoE to maintain objectivity and scientific rigor while identifying gaps across a large area of research.

2.1 Procedures

Figure 1 provides an overview of the 2018 methodology. The arrows in the figure represent actions and sources of input at each step, and the triangle segments represent the resulting product at each step (see Figure 1).

Figure 1. Overview of Research Gap Identification and Prioritization Process



2.1.1 Convene the PHCoE Workgroup

PHCoE convened an internal workgroup of 12 subject-matter experts (SMEs) in military psychological health research, clinical care, and research methodology. The multidisciplinary workgroup was composed of clinical and research psychologists, epidemiologists, and neuroscientists.

2.1.2 Solicit External Stakeholder Input

Stakeholder input is an important means of ensuring that research gaps analyses focus on the needs of the population under consideration. We engaged stakeholders at three key decision points: (1) selecting the report topic (section 2.1.3), (2) rating potential gaps to determine which would undergo a full gap analysis (section 2.1.6), and (3) prioritizing the final list of research gaps (section 2.1.8). We included diverse groups of external stakeholders with experience in medical and non-medical aspects of military life (see Appendix A for external stakeholder groups).

2.1.3 Select Topic for Analysis

The selection of the psychological health topic for the 2018 gaps analysis involved a series of steps. First, members of the multidisciplinary PHCoE workgroup scanned authoritative source reports and used their knowledge of the MHS to generate a list of 22 potential research topics deemed relevant, important, and feasible within the military setting. Each of the initial 22 potential topics was supplemented with research highlights and surveillance data on prevalence, healthcare utilization, and cost to the MHS. The list was presented to PHCoE senior SMEs who culled the initial list of 22 potential topics to ten.

We next asked three groups of stakeholders with expertise in military psychological health to provide input on topic selection: the US Army Medical Research and Materiel Command (USAMRMC), the Army's Behavioral and Social Health Outcomes Practice (BSHOP), and the Behavioral Health Clinical Community (BHCC). See Appendix A for external stakeholder group descriptions. Representatives from these stakeholder groups reviewed the enhanced list of ten potential topics and endorsed their importance. BHCC also recommended two additional topics, which were added to the list. BHCC members then rated each of the 12 topics (see Appendix B) for "its potential to inform care in the MHS" using the following scale: 0 = no potential, 1 = low potential, 2 = moderate potential, 3 = high potential, and 4 = very high potential. Respondents also could select "no opinion," which was excluded from calculating average scores. A mean score was calculated for each potential topic. The highest scoring topic, adjustment disorders (mean score of 3.0), was selected for the 2018 research gaps analysis.

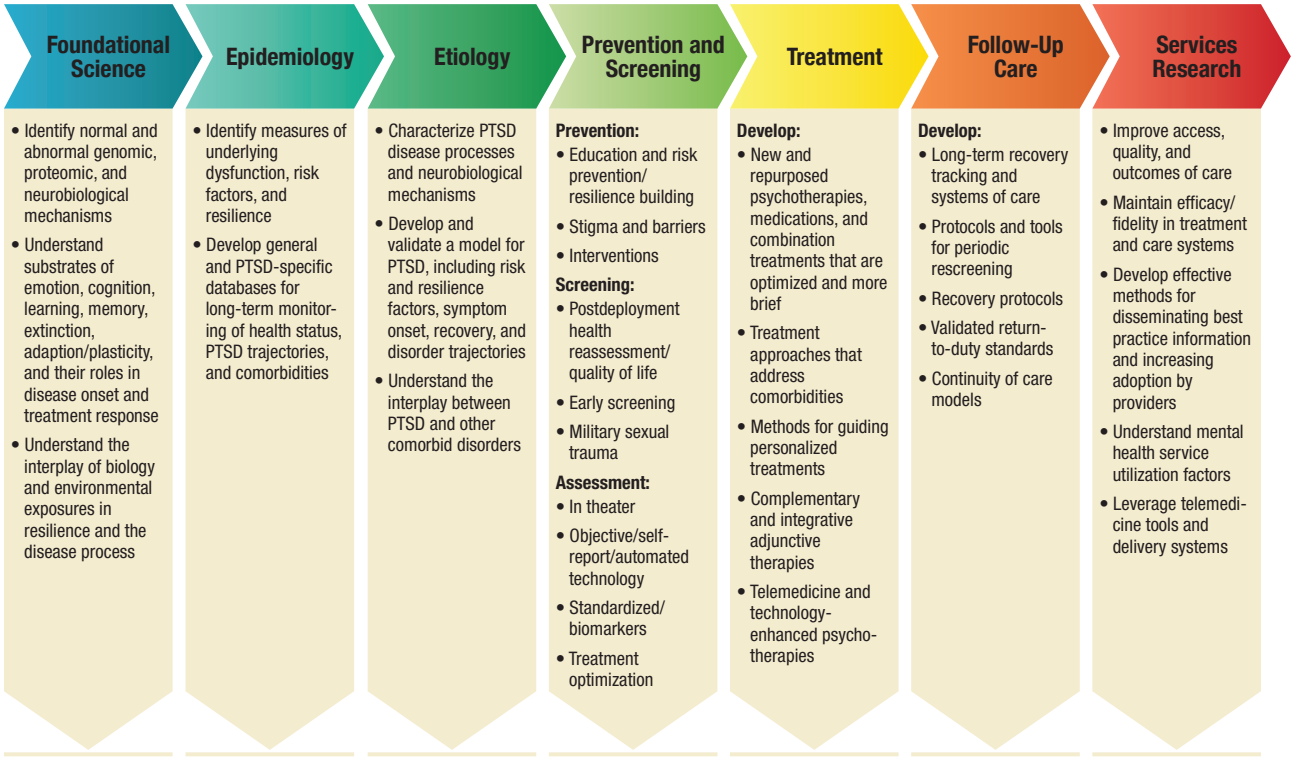
2.1.4 Identify Research-Needs Statements

To identify authoritative source reports on adjustment disorders, PHCoE searched the websites of government and non-profit organizations (e.g., National Institutes of Health, Institute of Medicine, US Department of Veterans Affairs National Center for PTSD). We also scanned mental health related military policy documents and conducted queries using Defense Technical Information Center and Google. This search included government reports, policy documents, reports by international and nonprofit organizations, and clinical practice guidelines. Reports mentioning adjustment disorders were screened by two reviewers who judged whether a report provided sufficient information about adjustment disorders to be considered an authoritative source report. Because most reports mentioned adjustment disorders in a cursory fashion, this search resulted in only two reports on adjustment disorders. We also conducted a search of published literature reviews to supplement the authoritative source reports due to the scarcity of reports on adjustment disorders. We conducted a search in PubMed using a combination of free-text key words and controlled vocabulary for adjustment disorders and identified 19 literature reviews, two of which were systematic reviews. See Appendix C.

Workgroup members then reviewed the authoritative source reports and literature reviews and extracted statements that identified research needs — questions that remain unanswered or unknown. We used the Interagency Research Continuum Approach described in the National Research Action Plan (NRAP) as a framework for assigning research-needs statements into one of the following categories: foundational science, epidemiology, etiology, prevention and screening, treatment, follow-up care, services research (DoD, Department of Veterans Affairs, Department of Health and Human Services, & Department of Education, 2013).

Because adjustment disorders were not well captured by authoritative source reports, we supplemented our existing methodology for generating research-needs statements. Workgroup members were each assigned a category from the NRAP research continuum, and they listed research topics that would need to be investigated in order to address the range of research included in a prototypical research portfolio. See Figure 2 for an example of PTSD research topics categorized according to the NRAP research continuum (DoD et al., 2013). The proposed research topics were not constrained by consideration of whether it was feasible to conduct this research or by whether the research had already been conducted. This resulted in a list of SME-derived research-needs statements on adjustment disorders. These combined processes yielded a list of 254 research-needs statements (see Appendix D), with 181 extracted from authoritative sources and review articles and 73 identified using subject-matter expertise.

Figure 2. NRAP Research Continuum Approach for PTSD Research



Copied from p11 of *National Research Action Plan* (DoD et al., 2013).

2.1.5 Refine Research-Needs Statements into Potential Research Gaps (Figure 1, C)

Workgroup members then discussed the 254 research-needs statements and removed duplicate entries, overly generic statements, and statements limited to methodological concerns. The workgroup also consolidated overlapping constructs by combining narrow statements into broader statements when appropriate. This process resulted in a refined list of 26 potential research gaps.

2.1.6 Potential Research Gaps

We engaged the Combat and Operational Stress Control (COSC) Workgroup to select a subset of these potential gaps to undergo a full gap analysis. See Appendix A for stakeholder group descriptions. The COSC Workgroup was deemed a good fit for this function because of members' familiarity with non-medical and preventative issues. COSC Workgroup members rated the importance of addressing each potential research gap to improve the health and readiness of ADSM and MHS beneficiaries using the following scale: 1 = very low, 2 = low, 3 = moderate, 4 = high, and 5 = very high. They also had the option to select "no opinion." Of the 26 gaps rated, 19 had an average score of three (moderate importance) or higher (see Appendix E). These 19 highest rated potential research gaps underwent further analysis, as described below.

2.1.7 Verify Research Gaps

2.1.7.1 EXAMINE PUBLISHED SCIENTIFIC LITERATURE

PHCoE workgroup members reviewed the published scientific literature to determine the extent to which each of the 19 potential gaps had been addressed by existing research findings. A team of individuals external to PHCoE with expertise in conducting literature searches coordinated with the PHCoE workgroup to produce a systematic search strategy. For each potential research gap, separate search terms and inclusion/exclusion criteria were defined to facilitate capture of relevant research articles while minimizing irrelevant results. Literature searches were conducted in two web-based, publically available databases, PubMed (MEDLINE) and the Cochrane Library. Results were filtered to retain only peer-reviewed articles published in English in the last decade (January 2008 to August 2018). Research articles were limited to those in peer-reviewed journals conducted using the following study designs: systematic reviews or meta-analyses, randomized control trials, or observational studies. Two SMEs independently rated articles for inclusion, and, when they disagreed, the larger search team resolved the discrepancy by consensus.

Each potential gap was then assigned to a workgroup member, who received a spreadsheet with search results that included the number of initial search results, number of final relevant publications, and title and abstract of each relevant publication. The workgroup member screened each abstract and read the full article when the abstract suggested relevant

findings. Workgroup members conducted additional searches of the literature that were less constrained by the criteria used in the systematic searches.

2.1.7.2 EXAMINE IN-PROGRESS RESEARCH INVESTMENTS

Our next step was to consider whether military and civilian in-progress research investments — studies not yet completed or reported — on adjustment disorders could address any of the potential gaps. This step involved three processes: (1) we reached out to external stakeholders regarding their research portfolios; (2) we reviewed content presented at research committees, meetings, and national conferences attended during 2018; and (3) we reviewed in-progress studies listed on online clinical trial registries.

The workgroup contacted DoD funding agencies and research institutions about their research portfolios. These organizations included USAMRMC, BSHOP, Uniformed Services University of Health Sciences (USU), Walter Reed Army Institute of Research (WRAIR), Naval Center for COSC, Office of Naval Research, and Naval Health Research Center. None of these organizations included adjustment disorders in their research portfolios. The workgroup also attended research committees, meetings, and conferences during 2018, but workgroup members were unable to identify additional relevant in-progress reports of significance via this means.

The workgroup also searched the following clinical trial registries and federal grant listings for in-progress research: clinicaltrials.gov, grants.gov, and the WHO International Clinical Trials Registry Platform (www.who.int/ictrp/en/) for information about in-progress research on adjustment disorders. These database searches yielded approximately 400 candidate studies that we then screened for relevance to our search for research gaps relating to adjustment disorders. A review of titles and abstracts of each study resulted in 30 studies that were judged as relevant to the list of potential gaps. Workgroup members reviewed each of the in-progress studies for relevance.

2.1.7.3 RETAIN, REMOVE, OR REVISE RESEARCH GAPS

After reviewing the relevant published literature and in-progress studies, workgroup members prepared reports on each potential gap. The reports included the number of search results for that gap, the number of relevant articles reviewed (categorized into systematic review/meta-analysis, narrative/review, randomized controlled trial, non-randomized study), number of relevant in-progress studies, and a narrative synthesis and summary of their findings. Members also provided their judgements and rationale on whether each of their assigned potential gaps should be retained, revised, or removed from the list. The workgroup discussed the findings and reached consensus on inclusion or exclusion of each gap (see Appendix F). This resulted in a list of 11 research gaps that had been verified as an unfilled gap by investigating published and in-progress studies.

2.1.8 Prioritize Research Gaps

The 11 gaps were then prioritized in order of importance by representatives from the Veterans Health Administration and the National Center for PTSD, USU, WRAIR, COSC Workgroup, and BHCC. See Appendix A for stakeholder group descriptions. Stakeholders were informed of the purpose of the gaps analysis prioritization and were provided with a rating form. The form included the 11 gaps as well as supplemental research methodology considerations specific to each gap. Respondents were asked to rate the importance of addressing each research gap in order to improve the health and readiness of ADSM and MHS beneficiaries, using the following scale: 1 = very low, 2 = low, 3 = moderate, 4 = high, 5 = very high, and no opinion.

3.0 Results

A priority score was obtained for each of the 11 gaps by calculating the mean rating from all respondents for each gap. The range of possible mean scores was 1 to 5. Actual mean scores ranged from 2.29 to 4.50. The prioritized list of gaps, along with the NRAP category and the research considerations specific to that gap, are presented in Table 1. Figure 3 provides a visual depiction of the gaps ranging across the entire NRAP spectrum.

The highest rated gap, *Develop and test the effectiveness of interventions that address reaction to the stressor in preventing adjustment disorders*, emphasizes the importance of research on primary prevention interventions for adjustment disorders. Currently, studies on the interventions targeting stress response do not assess for adjustment disorders as an outcome. This may represent an important omission, considering that adjustment disorders are, by definition, reactions to stress (APA, 2013). Measuring adjustment disorders as an outcome would be further facilitated by the development of valid and reliable screening and assessment measures for adjustment disorders (see gap number 9). These measures would also allow for research on secondary prevention interventions that target adjustment disorders in their early stages.

The second highest rated gap was: *Elucidate the longitudinal trajectories of adjustment disorders (i.e., does it remit, become chronic, or change to a more severe diagnosis?)*. Given that adjustment disorders are diagnosed frequently, it is important to know the various potential courses of the disorder. This may involve examining changes in diagnosis as well as functional and suicidal events associated with adjustment disorders using longitudinal designs. Other highly rated gaps focus on understanding the factors that lead to development of adjustment disorders, which may provide opportunities for preventative measures or early interventions. For example, gap number three is: *Identify the defining characteristics (e.g., context, duration, and severity) of stressor types that precipitate adjustment disorders* (see also foundational science, etiology, and epidemiology gaps).

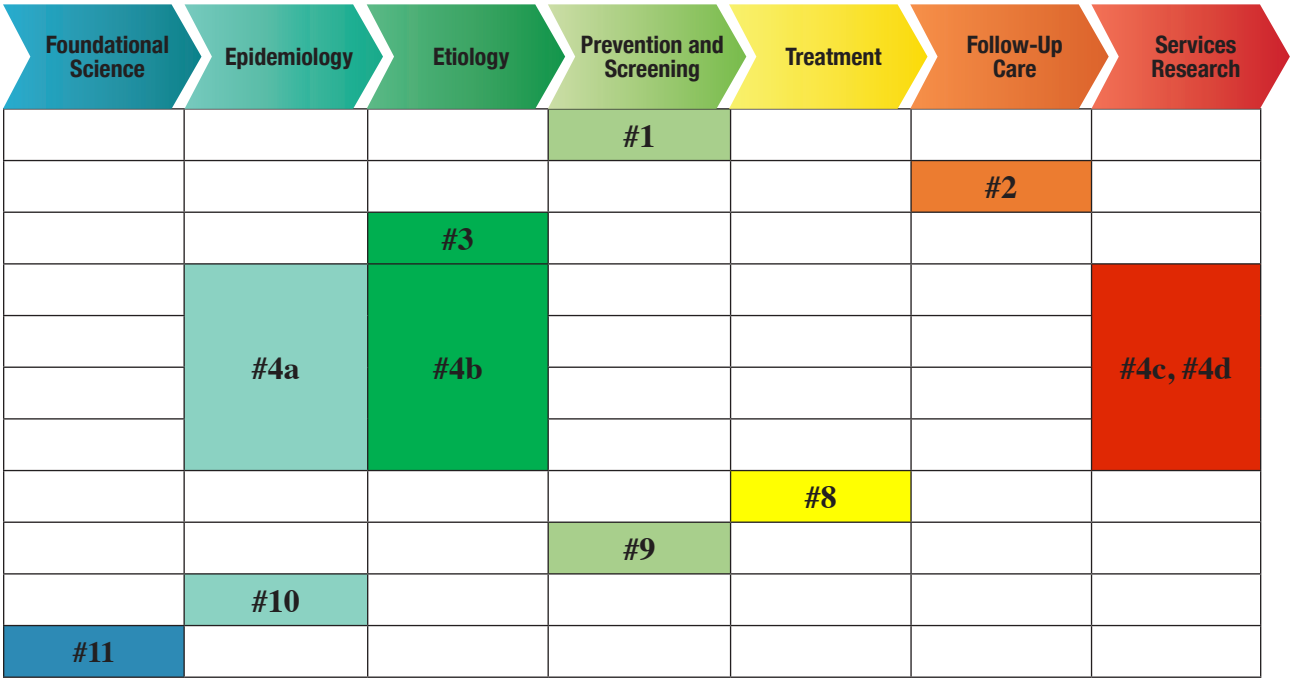
Table 1. Prioritized List of Research Gaps

Rank	Mean Score	Research Recommendation *(NRAP)*	To Consider
1	4.50	Develop and test the effectiveness of interventions that address reaction to the stressor in preventing adjustment disorders *(Prevention and Screening)*	• Interventions might include psycho-educational and resilience-building interventions • Interventions might target people who have recently experienced a stressor and include adjustment disorder as an outcome measure
2	4.29	Elucidate the longitudinal trajectories of adjustment disorders (i.e., does it remit, become chronic, or change to a more severe diagnosis?) *(Follow-up)*	• Conduct studies using non-cross-sectional designs • Consider suicidal events as an outcome measure
3	4.14	Identify the defining characteristics (e.g., context, duration, and severity) of stressor types that precipitate adjustment disorders *(Etiology)*	• Consider comparisons between stressor types as well as the cumulative effect of stressors • Consider separate and combined effects of military-specific stressors such as relocation, deployment, combat, occupational changes, and separation
4a	3.86	Investigate the interactions of psychosocial and environmental pre-existing factors with the stressor in predicting the development of adjustment disorders *(Epidemiology)*	• Pre-existing factors can include personality, demographic, cultural, and childhood factors • Consider military-relevant stressors such as combat, physical illness, and disaster
4b	3.86	Investigate adaptive and maladaptive stress responses that predict development of adjustment disorders *(Etiology)*	• Consider coping style as a mediator of the effect of cumulative stressors on development of adjustment disorders • Conduct well-controlled studies and consider using a longitudinal design
4c	3.86	Investigate the effects of adjustment disorders diagnoses on treatment engagement, care pathways, healthcare utilization and functional outcomes *(Services Research)*	• Consider patients with other psychiatric diagnoses who receive an adjustment disorder diagnosis instead due to stigma, underreporting, or other potential reason, and whether this misdiagnosis may influence their care trajectories and recovery
4d	3.86	Identify optimal settings and timing for adjustment disorders screenings *(Services Research)*	• Consider occupation-specific stressors (e.g., military: geographical relocation or when assuming new responsibilities)

Table 1. Continued

Rank	Mean Score	Research Recommendation *(NRAP)*	To Consider
8	3.83	Examine psychotherapy and pharmacotherapy interventions for adjustment disorders that consider stressor, setting, and subtype (including combination and brief/low intensity approaches) *(Treatment)*	• Utilize randomized controlled trials • Across trials, use consistent diagnostic criteria and outcome measures, including important secondary outcomes such as quality of life and functioning • Consider low-threshold interventions (e.g., brief, computer-based, self-help) that increase accessibility and reduce treatment barriers (e.g., stigma)
9	3.57	Develop valid and reliable screening and assessment measures for adjustment disorders *(Prevention and Screening)*	• Use established methods to validate adjustment disorders screeners, including use of gold-standard instruments as the reference standard, employing consecutive or random sampling, minimal exclusion criteria, and adequate sample size
10	3.14	Examine the validity and reliability of diagnostic criteria for adjustment disorders *(Epidemiology)*	• Consider unique features of adjustment disorders relative to other disorders with overlapping symptoms • Consider comparison of ICD-11 criteria with DSM-5 criteria and impact on prevalence, treatment, and outcomes in the military
11	2.29	Examine biological, including epigenetic, factors that increase vulnerability for development of adjustment disorders *(Foundational Science)*	• Distinguish predisposing factors from the potential adjustment disorders criterion stressor • Consider studies using prospective longitudinal and other non-cross-sectional designs

Figure 3. Research Gaps Mapped to the NRAP Research Continuum



The Agencies' Interagency Research Continuum Approach [DoD et al., 2013]

3.1 Adjustment Disorder-Specific Research Recommendations

In past reports, PHCoE has identified general recommendations pertaining to study design and methodology that researchers should consider when initiating any new research in the DoD, when appropriate and feasible (PHCoE 2017, 2018. See Appendix G).

This year, we identified five recommendations in response to common inconsistencies and deficiencies in the adjustment disorders research we reviewed.

1. Adjustment disorders should be defined more consistently in behavioral sciences research.
2. The term 'adjustment disorder' should be differentiated from the term 'adjustment' and other types of transition and stress.
3. Studies of adjustment disorders should use a consistent approach to diagnosing and measuring the disorders, including a measure that can indicate resolution of the disorder.
4. Sufficient research needs to be conducted such that treatment guidelines for adjustment disorders can be produced.
5. Measures of adjustment disorders should be included in large screening studies.

4.0 Discussion

The primary goal of the annual PHCoE gaps analyses project is to identify gaps in an area of psychological health research, thus providing information to funding agencies that may help them prioritize research investments. In 2018, we addressed the topic of adjustment disorders, a prevalent but under-researched condition. Lessons from previous years highlighted the importance of stakeholder involvement in gap identification and prioritization. In 2018, we increased stakeholder engagement at key decision points.

For the analysis of adjustment disorders, an initial list of 254 research-needs statements was distilled down to a prioritized list of 11 final research gaps which spanned the full range of the NRAP continuum. Five recommendations specific to adjustment disorders research were identified and provided. While the goal was to determine the most important research gaps in the field of adjustment disorders research, the 11 gaps do not represent an exhaustive list. Gaps were excluded that were judged to be premature for near-term research due to the current state of the science. For example, biological mechanisms of pharmacological treatments are an essential part of a prototypical research portfolio on a mental health disorder. However, this gap was removed because it was deemed unfeasible to investigate without a better understanding of the biological mechanisms of adjustment disorders. This and other similar topics should be investigated after some of the more basic questions identified in this report have been addressed.

The relative lack of research attention to understanding adjustment disorders may be due in part to having poorly defined diagnostic criteria, as well as the lack of adequate measurement tools. Currently used versions of the DSM and the ICD classification systems are fairly comparable and include similar adjustment disorder subtypes. However, a beta version of ICD-11 released in May 2012 (https://www.who.int/classifications/icd/revision/timeline/en/) represented a notable change and simplification of diagnostic criteria. Subtypes were eliminated and two new symptoms were proposed: preoccupation with the stressor, and failure to adapt. In turn, new screening and assessment tools were constructed and have been field-tested primarily in Europe, demonstrating good reliability and validity (Kazlauskas, Zelviene, & Lorenz, 2018). Full implementation of ICD-11 criteria planned for 2022 may advance research in the field of adjustment disorders, particularly if corresponding screening and assessment tools are used in subsequent research studies.

4.1 Challenges, Response, Way Forward

During the 2018 research gaps analysis process, we evaluated our gap analysis methodology and identified challenges associated with research gap identification and prioritization. Table 2 lists these challenges, describes how methodology was adapted to meet these challenges, and recommends the way forward.

Table 2. Challenges, Responses, and Way Forward

Challenge	Response	Way Forward
1. PHCoE did not have a standardized process for selecting psychological health topic(s) to undergo the research gaps analysis	Developed a five-fold process to select the research gaps topic: • PHCoE workgroup SME's constructed a list of potential topics • High level authoritative source documents were scanned for additional topics • Surveillance data were pulled to inform the prevalence, healthcare utilization, and cost of selected topics • Published literature was reviewed to further inform each topic • External stakeholder groups provided feedback and ultimately selected the gaps topic	• Continue to employ the five-fold process to select topic • Incorporate pending results from survey of MHS providers to help inform topic selection[a]
2. There is an inherent degree of subjectivity and potential bias involved in the processes of both *identifying* and *prioritizing* research gaps	• Increased the number and diversity of external stakeholders to limit input from a single, potentially biased, group • Increased the role of external stakeholders at three important decision points: ▫ selection of gaps topic area ▫ selection of most important potential gaps ▫ prioritization of final gaps	• Continue to utilize expert external stakeholder ratings to identify and prioritize the gaps

Table 2. Continued

Challenge	Response	Way Forward
3. There are no standardized guidelines for incorporating stakeholders into the research gaps analysis process, e.g., deciding which stakeholders to include, at what point in the process, for what task, and with what feedback format	• Developed and piloted stakeholder processes outlined in the Method section	• Continue refining stakeholder involvement procedure
4. PHCoE did not have a protocol for conducting gaps analysis on a topic with little research, and, in particular, identifying needs statements for disorders not addressed by authoritative source reports	• Expanded the breadth of authoritative sources from government reports and documents to include a wide range of gray literature and review articles • Continued the process of obtaining gaps from PHCoE SMEs to augment authoritative source gaps • Considered what a prototypical research portfolio might include based on the NRAP and used this to produce needs statements	• Continue to expand the definition of authoritative sources as necessary • Increase the involvement of experts and stakeholders in identification of needs statements
5. A lack of comprehensive, centralized research tracking mechanisms makes it difficult to have visibility on all in-progress research, and in-progress research review is inherently limited because the quality and outcomes of the research are not yet determined	• Reviewed all possible sources of information regarding in-progress studies, including outreach to external stakeholders about their research portfolio; reviewed in-progress studies listed on relevant websites; and reviewed unpublished studies presented at national conferences • Expanded search of clinical trial registries to include international trials and funded grant announcements • Captured number of pertinent in-progress studies and certain quality variables, such as design of trials	• Continue to strengthen relationships with relevant stakeholders in order to obtain more complete in-progress research portfolio information • Continue to review in-progress studies presented at national conferences

[a]In 2018, PHCoE disseminated the Psychological Health Provider Needs and Preferences Survey to MHS providers to obtain their viewpoint about military psychological health clinical care and research needs. Over 450 responses were received and the data are undergoing analysis at this time.

4.2 Limitations

PHCoE's methodology relies on using authoritative source reports to identify research-needs statements. A lack of authoritative source reports on adjustment disorders could have resulted in omissions of important research-needs statements. For the 2018 research gaps analysis process, the research gaps methodology was adapted in multiple ways to ensure that important gaps were not omitted. First, the small number of authoritative sources were supplemented with literature reviews in order to generate a sufficient number of research-needs statements regarding adjustment disorders. Next, a process was developed to safeguard against missing important gaps that had not been considered in authoritative source reports. Using the NRAP research continuum with PTSD research gaps as a guide (see Figure 2), an additional list of research-needs statements was generated by considering which research topics would need to be addressed to make up a complete research portfolio. Finally, to further address the lack of published research on adjustment disorders, research dating back ten years was reviewed rather than limiting the review to more recent literature as previously in our reports.

Historically, adjustment disorders have vaguely defined diagnostic criteria (including loose definition of the precipitating stressor), which poses difficulties in comparing results across studies and in reaching generalizable conclusions. Additionally, many research studies reviewed reported on sub-threshold states of depression or anxiety; it is possible that these conditions represented subtypes of adjustment disorders. For the current gaps analysis, only those studies that explicitly identified adjustment disorders as a topic were included, which may have resulted in the exclusion of studies that included subjects with adjustment disorders.

4.3 Conclusion

PHCoE applied a systematic and transparent methodology to identify, refine, and prioritize research gaps related to adjustment disorders for calendar year 2018. This effort, building upon previous reports (PHCoE, 2017; PHCoE, 2018), incorporated stakeholder input and relied on military psychological health experts to review authoritative sources and synthesize published and in-progress research. From this gaps analysis process, a final prioritized list of 11 research gaps on adjustment disorders was produced. This initiative is an important effort that applied a systematic approach to prioritizing research gaps. Such an approach increases the likelihood that important and relevant research gaps are prioritized. This report intends to inform decisions regarding future research study selection and funding. Stakeholders may use it in conjunction with existing prioritization processes while continuing to rely on other experts and portfolio managers to identify research priorities.

To our knowledge, no military health organization is conducting research on adjustment disorders. Despite their high prevalence and significant health care burden, adjustment disorders do not appear to have captured the attention of policy makers or researchers, military or civilian, as evidenced by their lack of coverage in authoritative source reports and in-progress research portfolios. This analysis highlights the need for research on adjustment disorders in the military.

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6.0 Acronyms

AD	Adjustment Disorders
ADSMs	Active-Duty Service Members
BHCC	Behavioral Health Clinical Community
BSHOP	Behavioral and Social Health Outcomes Practice
COSC	Combat and Operational Stress Control
DoD	Department of Defense
DSM	Diagnostic and Statistical Manual of Mental Disorders
ICD	International Classification of Diseases
MHS	Military Health System
NRAP	National Research Action Plan
PHCoE	Psychological Health Center of Excellence
PTSD	Posttraumatic Stress Disorder
RCT	Randomized Controlled Trial
SMEs	Subject Matter Experts
SUD	Substance Use Disorder
USAMRMC	U.S. Army Medical Research and Materiel Command
USU	Uniformed Services University of Health Sciences
WHO	World Health Organization
WRAIR	Walter Reed Army Institute of Research

7.0 Appendix A: External Stakeholder Groups

1. Select topic for gaps analysis (section 2.1.3)
   - US Army Medical Research and Materiel Command (USAMRMC)
     - Manages research portfolios for the DoD
     - Develops medical materiel for the US Army
     - Has responsibility for medical acquisition, research, development, and logistics management
   - Behavioral and Social Health Outcomes Practice (BSHOP)
     - A division of the Army Public Health Center, monitors behavioral health trends of soldiers, identifies risk factors, and conducts program evaluations
   - Behavioral Health Clinical Community (BHCC)
     - Consists of key DoD behavioral health and substance abuse senior leaders, stakeholders, and advisors from Health Affairs, DHA, and the Services who provide governance and oversight to ensure the delivery of high quality behavioral health care to MHS beneficiaries
     - All activities within the DoD related to behavioral healthcare delivery, quality, cost, process, access, and patient experience of care are reviewed by BHCC for their input, review, support and approval before implementation
2. Select a subset of potential gaps to undergo a full gap analysis (section 2.1.4)
   - Combat and Operational Stress Control (COSC) Workgroup
     - Serves to ensure joint application of best practices in combat operational stress control
     - Includes members from the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard
3. Prioritize Research Gaps (section 2.1.8)
   - Veterans Health Administration and the US Department of Veterans Affairs National Center for PTSD
     - Provides healthcare benefits for eligible former ADSMs, the nation's largest integrated medical system with 172 medical centers
     - The National Center for PTSD has as its mission the advancement of clinical care and social welfare for Veterans and others who have had traumatic experiences or who suffer with PTSD
   - Uniformed Services University of Health Sciences (USU)
     - USU provides education in the health sciences with a specific mission to serve the Department of Defense and the United States Public Health Service
   - Walter Reed Army Institute of Research (WRAIR)
     - WRAIR is the largest biomedical laboratory in the Department of Defense with a focus on conducting research in response to the DoD and US Army requirements
   - COSC Workgroup — see above
   - BHCC — see above

8.0 Appendix B: Potential Topics List for 2018 Research Gaps Analysis

Table B. Potential Topic List for 2018 Research Gaps Analysis

Topic	Generated by Research Gaps Work Group	Generated by Authoritative Source Review	Generated by BHCC
Adjustment Disorders	✓	✓	
Anger/Violence (includes Domestic Violence)	✓	✓	
Anxiety Disorders	✓	✓	
Co-Occurring Psychological Health Conditions and Chronic Pain	✓	✓	
Impulsive/Reckless Behaviors	✓		
Operational Stress (includes Combat Stress)		✓	
Relationship/Family Issues (includes Domestic Violence)	✓	✓	
Service Dogs			✓
Sexual Assault	✓	✓	
Sleep Disorders (excludes Sleep Apnea)	✓	✓	
Suicide/Suicidal Ideation	✓	✓	
inTransition Program Effectiveness			✓

9.0 Appendix C: References for Reports by Authoritative Sources

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10.0 Appendix D: Research-Needs Statements

Table D1. Authoritative Source Research-Needs Statements

#	Source	Page	Needs Statements
1.	Ali, 2007	2	"Recent clear guidelines for the treatment of adjustment disorders are lacking."
2.	Ali, 2007	2	"…there has been relatively little research on the effectiveness of treatments for adjustment disorders especially in an occupational health care setting."
3.	Ali, 2007	11	"…there is a significant lack of research studies that compare the efficacy of different treatment options for adjustment disorders. This may be attributed to the lack of specificity in the diagnosis itself, or the variability in the types of stressors involved in adjustment disorder."
4.	Ali, 2007	11	"…it appears that although adjustment disorder is common there is a significant lack of research studies that compare the efficacy of different treatment options for adjustment disorders."
5.	Ali, 2007	11	"Due to the lack of effective studies, there is a need for more robust studies to assess the effectiveness of treatment options for adjustment disorders."
6.	Ali, 2007	11	"Until such robust studies are published, there is no potential for a TechBrief or systematic review to be carried out on adjustment disorder."
7.	O'Donnell, Metcalf, & Varker, 2016	10	"Indeed, research has found that intrusions, ruminations, avoidance and adaptive failure are common processes that appeared to be central to adjustment disorder. However, this proposed [International Classification of Diseases 11th Revision (ICD-11)] criteria (i.e. intrusions and failure to adapt) marks a significant deviation from the [Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)] criteria (any one criteria pertaining to distress)."
8.	O'Donnell et al., 2016	10	"There remains significant ongoing debate about how to best conceptualise adjustment disorder. The primary concerns with the current classification structure of adjustment disorder, both in the past and in current classification systems, is that it is ill-defined as a specific diagnostic category, and this diagnostic vagueness has made research investigating adjustment disorder exceptionally difficult."
9.	O'Donnell et al., 2016	10	"...it is clearly a frequent diagnosis across a variety of settings and there is some evidence to suggest that it may be more common amongst military populations than civilian."
10.	O'Donnell et al., 2016	11	"While the current [International Classification of Diseases 10th Revision (ICD-10)] states that individual predisposition or vulnerability plays a bigger role in the risk for adjustment disorder than other psychiatric disorders, including [posttraumatic stress disorder (PTSD)], the evidence supporting this statement has been questioned. There is little research investigating individual predisposition, such as personality factors, in the risk for developing adjustment disorder."
11.	O'Donnell et al., 2016	11	"In addition to a strong link with increased suicidality, adjustment disorder is recognised as a potential prodromal expression of other psychiatric disorders."
12.	O'Donnell et al., 2016	12	"Very little research has investigated the neurological/biological underpinnings of adjustment disorder, or how they compare to other psychiatric disorders."
13.	O'Donnell et al., 2016	12–13	"Under the DSM system, individuals can be given a diagnosis of adjustment disorder with anxiety, depressed mood, or disturbance of conduct, a mixed anxiety/depression subtype, or a mixed disturbance in emotions and conduct. The degree to which these subtypes are discriminatory has received little research attention…Research has also questioned whether different subtypes impact treatment options or outcomes. In contrast to DSM approach, ICD-11 is proposing that adjustment disorder is a uni-faceted concept, arguing there is no evidence for the validity or utility of subtypes of adjustment disorder."

Table D1. Continued

#	Source	Page	Needs Statements
14.	O'Donnell et al., 2016	25	"In addition to the efficacy of treatments for adjustment disorder being unknown, a number of other significant gaps in knowledge remain. For example, all of the studies focused on the treatment of adjustment disorder, as opposed to the prevention of other psychiatric disorders, despite emerging evidence that adjustment disorder is a gateway disorder to full-blown psychiatric disorders. Whether current treatments can prevent adjustment disorder from developing into a more severe psychiatric disorder has not been investigated."
15.	O'Donnell et al., 2016	25	"All the treatments reviewed in this report were for adjustment disorder and their efficacy were ranked as unknown, due to the strength of the evidence being low."
16.	O'Donnell et al., 2016	26	"There are a number of guidelines for the treatment of similar disorders, such as depression, that may be relevant to appropriate treatment for adjustment disorder. People with a subthreshold or mild depression will often also meet criteria for an adjustment disorder and if this was the case, evidence based treatments for subsyndromal/mild depression could also be relevant for adjustment disorder."
17.	O'Donnell et al., 2016	26	"Adjustment disorder may be considered well-suited to a self-help intervention or other low-intensity intervention, as it is considered a subthreshold disorder. Self-help interventions can vary in their amount of therapist involvement, from pure self-help (no therapist contact) to guided self-help (minimal therapist contact) and can occur across a range of mediums including bibliotherapy, computerised, and internet-administered self-help. Other forms of low intensity interventions should also be considered such a brief face to face interventions with non-expert therapists such as in the UK Improving Access to Psychological Therapies model."
18.	O'Donnell et al., 2016	27	"There is a lack of [randomized controlled trials (RCTs)] for pharmacological treatments of adjustment disorder."

Table D2. Review Article Research-Needs Statements

#	Source	Page	Needs Statements
1.	Arends et al., 2012	2	"These results are based on moderate-quality evidence, which implies that further research [on interventions to facilitate return to work in adults with adjustment disorder] is likely to have an important impact on our confidence in the results and may change the results."
2.	Arends et al., 2012	22	"…studies on the effect of other types of interventions, such as pharmacological interventions or exercise programmes, on [return to work (RTW)] are lacking."
3.	Arends et al., 2012	22	"Furthermore, not enough studies were included to perform subgroup analyses for organisational setting, treatment setting and type of job, which impedes generalisation of the results."
4.	Arends et al., 2012	22	"…it may be interesting to conduct more research on workers in job types that are known to be related to high sick leave rates because of adjustment disorders, such as in health care and education."
5.	Arends et al., 2012	22	"It could be that this is a gender-specific effect and it should be studied more among women."
6.	Arends et al., 2012	23	"Thus, our hypothesis that the interventions included in this review might be more effective in other countries than the Netherlands needs to be evaluated by future research to be confirmed."
7.	Arends et al., 2012	23	"For future research, it would be helpful to come to a shared definition for the group of patients that suffer from adjustment disorders and validated assessment tools, to enhance comparability between studies."

Table D2. Continued

#	Source	Page	Needs Statements
8.	Arends et al., 2012	24	"It would be interesting to know more about workers after they have returned to work. It could be that workers are less productive or not functioning well after their RTW. Therefore, it would be helpful to include other work-related outcomes in addition to sick leave measures to gain insight into the process after RTW in future studies."
9.	Bachem & Casey, 2018	243	"Risk and protective factors specific to [adjustment disorder (AD)] should be identified and the biological underpinnings of the disorder should be explored."
10.	Bachem & Casey, 2018	243	"Key directions for future research include investigating the concordance of the [International Classification of Diseases 11th Revision (ICD-11)] and [Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)] concepts and the effect that the diverging conceptualizations may have."
11.	Bachem & Casey, 2018	243	"Given the high prevalence of AD in certain clinical settings effective disorder-specific interventions should be developed and evaluated."
12.	Bachem & Casey, 2018	245	"As they are measured at a single time point, their trajectory is clinically unclear…Recent findings suggest that AD may be a chronic condition in approximately one third of the cases though further studies are required to determine trajectories of AD."
13.	Bachem & Casey, 2018	249	"There is an absence of evidence of benefit from antidepressants due to the paucity of quality [randomized controlled trials (RCTs)]"
14.	Bachem & Casey, 2018	251	"Research considering culture-specific epidemiology, aetiology and treatment is required."
15.	Bachem & Casey, 2018	251	"In order to identify AD-specific risk factors, it has been proposed that gene-environment interactions should be investigated in future research to explain the vulnerability and resilience of individuals with regard to AD."
16.	Bachem & Casey, 2018	251	"Furthermore, specific stressors might be relevant for certain populations such as migrants or cultural minorities and the need for developing culture-sensitive treatment methods has been stressed."
17.	Bachem & Casey, 2018	251	"Finally, given the high prevalence of AD in certain clinical settings as well as the exceptionally low rates of service use in this population, effective disorder-specific interventions should be developed and evaluated."
18.	Bachem & Casey, 2018	254	"Few studies have investigated cultural issues related to AD."
19.	Baumeister & Kufner, 2009	409	"There is a need for revision of adjustment disorders."
20.	Baumeister & Kufner, 2009	409	"…the border disputes of what differentiates adjustment disorders from normal human adaptation processes and from other (more specific) disorders need to be solved."
21.	Baumeister & Kufner, 2009	409	"…we lack reliable prevalence estimations of adjustment disorders."
22.	Baumeister & Kufner, 2009	409	"…the lack of evidence results from a lack of operational diagnostic specificity making research efforts difficult."
23.	Baumeister & Kufner, 2009	409	"…the recommendation should be to adjust this category in order to provide the basis for research on adjustment disorders."
24.	Baumeister & Kufner, 2009	409	"…as yet, there is hardly any effectiveness proven treatment strategy for adjustment disorders."
25.	Baumeister & Kufner, 2009	410	"Even without sufficient empirical evidence for a revision, as is the case with adjustment disorders, we can still revise adjustment disorders based on expert opinions."
26.	Baumeister & Kufner, 2009	410–411	"Also, studies often fail to operationalize the clinical significance criterion. Therefore, research should focus on an appropriate operationalization of the clinical significance criterion."
27.	Baumeister & Kufner, 2009	411	"A consolidated view of these results implies the need for a nosological redefinition of adjustment disorders. Instead of the current relegation of adjustment disorders, this redefinition should be based on distinct inclusion and exclusion criteria."

Table D2. Continued

#	Source	Page	Needs Statements
28.	Bryant, 2011	235	"…the acute stress disorder diagnosis appears to have very poor capacity to predict [posttraumatic stress disorder (PTSD)] in injured children. It is possible that children experience different trajectories of posttraumatic adjustment than adults, that the key markers of psychological impairment are distinctive in children, or that he definition of acute stress disorder or PTSD may not adequately capture the nature of stress reactions in children.
29.	Bryant, 2011	237	"…it is possible to describe [acute stress] reactions by describing them as an adjustment disorder. Although there are many similarities between the definition of adjustment disorder and acute stress disorder, there are several reasons to argue against using the adjustment disorder diagnosis for this purpose."
30.	Bryant, 2011	237	"…there are clearly defined treatment protocols for acute posttraumatic stress reactions, and it may be beneficial in treatment planning to describe acute stress reactions as a specific type of reaction."
31.	Carta, Balestrieri, Murru, & Hardoy, 2009	1	"To better determine the correct course of therapy, randomized-controlled trials, even for the combined use of drugs and psychotherapies, are needed vitally, especially for the resistant forms of AD."
32.	Carta et al., 2009	1	"Despite clinical suggestion of a large prevalence in the general population and the high frequency of [AD] diagnosis in the clinical settings, there has been relatively little research reported and, consequently, very few hints about its treatments."
33.	Carta et al., 2009	1	"We lack efficacy surveys concerning treatment."
34.	Carta et al., 2009	3	"[World Health Organization (WHO)] classification specifies that predisposition or individual vulnerability plays a greater role in conditioning the onset and symptoms of adjustment disorders than in other disorders of the same cluster (neurotic syndromes, F43), and disorder would not start without the stressor…This implies a sort of "stress vulnerability syndrome", even if it does not correspond to a diagnostic group."
35.	Carta et al., 2009	6	"At the moment, the distinction between AD and [major depressive disorder (MDD)] cannot be supported by biological data…"
36.	Carta et al., 2009	6	"…given the complexities regarding diagnosis, it is not surprising that no questionnaire type instrument currently exists for AD diagnosis, although clinicians sometimes make a descriptive diagnosis using questions regarding the patients symptoms and their duration."
37.	Carta et al., 2009	6	"The second dispute is the problem of overlap with other disorders. Both ICD-10 and DSM-IV attempt to overcome this problem by specifying that if criteria for another disorder are met, then the diagnosis of AD should not be made; in essence the diagnosis is one of default."
38.	Carta et al., 2009	7	"At the present the questions, "Do people with AD have high vulnerability to common stressor or normal vulnerability to severe stressors?" and, "Are people with specific personality traits more prone to AD?" are still unresolved."
39.	Carta et al., 2009	8	"Most of the large epidemiological surveys of the general population lack prevalence data for AD…"
40.	Carta et al., 2009	8	"As previously mentioned there is no clinical interview sufficiently robust in diagnosing AD so data produced with a screening test without any preliminary accuracy study against a diagnosis produced by a clinical structured or semi-structured interview are to be used very carefully."
41.	Carta et al., 2009	10	"The problem of which psychotherapy may be useful in adjustment disorders cannot find a certain answer, due to lack of controlled clinical trials of different psychotherapies."

Table D2. Continued

#	Source	Page	Needs Statements
42.	Carta et al., 2009	10	"It is a shared opinion that currently, psychotherapy remains the treatment of choice for adjustment disorders, and we lack major pharmacotherapy studies to support antidepressant treatment. Unfortunately, psychotherapy is not very accessible: AD is often diagnosed in general practice."
43.	Carta et al., 2009	11	"The only randomized controlled trial found in literature about efficacy of psychotherapy in AD was the study of Van der Klink [and colleagues] that compared the "activating intervention" with "care as usual" (control group) for the guidance of employees on sickness leave because of an adjustment disorder. It was hypothesized that the intervention would be more effective than care as usual in lowering the intensity of symptoms, increasing psychological resources, and decreasing sickness leave duration."
44.	Carta et al., 2009	13	"The use of psychotropic drugs such as antidepressants, in AD with anxious or depressed mood is not properly supported and should be avoided in less severe forms of this disorder."
45.	Carta et al., 2009	13	"Data from randomized controlled trials would be particularly interesting, also in resistant forms, even with combined use of drugs and psychotherapies."
46.	Casey, 2008	1204	"The Clinical Interview Schedule (CIS) and the Composite International Diagnostic Interview (CIDI) do not incorporate AD at all. The Schedule for Clinical Assessment in Neuropsychiatry (SCAN) does include AD, but only at the end of the interview in Section 13, which deals with Inferences and Attributions. This comes after the criteria for all other disorders have been completed and there are no specific questions with regard to AD to assist the interviewer, relying instead on clinical considerations…The Structured Clinical Interview for DSM-IV (SCID) also includes a section dealing with AD but the instructions to interviewers specify that this diagnosis is not made if the criteria for any other psychiatric disorder are met, with the de facto effect of relegating it to a subsyndromal disorder."
47.	Casey, 2008	1204	"Stemming from the frequency of AD, especially in some medical conditions such as cancer, attempts to screen for this condition have been investigated…this scale measures a general dimension of depression, but is unhelpful with regard to diagnosing AD…Efforts to develop an AD screening instrument using a coping measure have also been unsuccessful…"
48.	Casey, 2008	1204	"…diagnosis of AD is also frequently given in medical settings when adverse emotional reactions to a range of illnesses are common. In this context, the diagnosis of AD has a particular utility as it distinguishes those who require mainly psychological assistance in coping with their illnesses from those who develop major depression and require antidepressants."
49.	Casey, 2008	1204	"…how to distinguish AD from the normal distress that occurs in response to any stressful event."
50.	Casey, 2009	928	"Despite its long history, the criteria for adjustment disorder in DSM-IV-TR continue to be vague and largely unhelpful. The core criterion is that the person must not meet the criteria for any other psychiatric condition, a bar that is set very low indeed, especially for major depression, which requires only five symptoms to be present for 2 weeks."
51.	Casey, 2009	928	"Among the tools that incorporate adjustment disorder, the concordance between the clinical and interview diagnosis is very poor, with the diagnosis being made more commonly in clinical practice than the diagnostic tools allow for."

Table D2. Continued

#	Source	Page	Needs Statements
52.	Casey, 2009	928	"The presence of a causal stressor is essential before a diagnosis of adjustment disorder can be made, while the symptoms vary and include those that are found in other common psychiatric disorders. It is also important to distinguish adjustment disorder from normal reactions to stressful events. Adjustment disorders are difficult to distinguish from normal responses to life's stressors, while the distinction from major depression also poses a classificatory conundrum since both are conceptually different."
53.	Casey, 2009	928	"1. There are no robust studies demonstrating benefits from antidepressants. 2. While antidepressants are advocated by some, especially if there has been no benefit from psychotherapy, there is little solid evidence to support their having an effect on depressive symptoms in those with adjustment disorders."
54.	Casey, 2009	929	"DSM-IV-TR states that adjustment disorder is a common diagnosis yet the evidence for this is unclear since it is seldom measured in epidemiological studies."
55.	Casey, 2009	929	"Adjustment disorders are said to be very common in primary care, where family practitioners deal with the long-term impact of physical illness as well as the consequences of social and interpersonal problems, all of which are associated with adjustment disorder. Prevalence rates from 11% to 18% have been described among consulters with mental health problems, although these studies were conducted over 20 years ago, and more recent studies are conspicuously absent."
56.	Casey, 2009	930	"1. What about patients with a diagnosis of adjustment disorder — is there an association with self-harm? The studies to date suggest that there is. 2. These studies all point to the role of personality disorder as a prominent feature of those with adjustment disorder who engage in self-harm."
57.	Casey, 2009	931	"Concerning the type of events, there is little to assist the clinician in distinguishing adjustment disorder from other diagnoses and even events of the magnitude that are typically associated with a diagnosis of post-traumatic stress disorder can also trigger adjustment disorder."
58.	Casey, 2009	932	"1. In both ICD-10 and DSM-IV-TR, the criteria for diagnosing adjustment disorder are silent with respect to specific symptoms. Nevertheless, there are some symptoms that may be of diagnostic assistance. The loss of mood reactivity, the presence of diurnal mood change, a distinct quality to the mood change and a family history of depression might suggest a depressive episode rather than adjustment disorder. 2. Since adjustment disorder represents, par excellence, a disorder in which environmental factors are prominent, it is possible that these symptoms will distinguish those with adjustment disorder from those with more biologically determined depression. Only further studies will demonstrate if these symptoms have sufficient specificity."
59.	Casey, 2009	933	"1. A problem arises if the DSM-IV-TR diagnostic criteria are rigidly applied since, once the criteria (symptom numbers and duration) for any other disorder are reached, the diagnosis of adjustment disorder cannot be made. In practice it is more likely that major depression will be overdiagnosed at the expense of adjustment disorder than the converse, due to the low threshold applied to major depression. 2. Finally, what may appear to be an adjustment disorder, because of the sub-threshold level of the symptoms or the lack of functional impairment, might be an axis I disorder in evolution that only emerges as a recognisable syndrome after a period of watchful waiting, especially if symptoms persist despite termination of the stressor. 3. For those experiencing long-standing stressors, the persistently low mood that is the response to these may be misdiagnosed as dysthymia, as enduring personality change after psychiatric illness (ICD-10 only) or as depressive personality disorder (DSM-IV-TR only)."

Table D2. Continued

#	Source	Page	Needs Statements
60.	Casey, 2009	934	'1. In general, brief therapies are considered the most appropriate as adjustment disorders tend to be short lived, although lengthier therapies may be required when stressors are chronic or when there is an underlying personality pathology that increases vulnerability to such stressors. 2. Unfortunately, the evidence base for these approaches is limited."
61.	Casey et al., 2013	2	"The biological rationale for using pharmacological agents is unclear, apart from the pragmatic approach to prescribing for symptomatic relief irrespective of the underlying psychobiology of the illness."
62.	Casey et al., 2013	2	"There has been general neglect of AD in research, in particular, the psychobiology of the condition has received little attention…[Other than AD with depressive features] there have been no studies on the psychobiology of the other subcategories of AD.
63.	Casey et al., 2013	3	"[Treating only for symptom relief] assumes that the pathophysiology of subsyndromal conditions such as AD and full syndromes such as MDD and [generalized anxiety disorder (GAD)] are the same and that the response to treatment will therefore be the same."
64.	Casey et al., 2013	3	"In the treatment of MDD, antidepressants are believed to act by enhancing the activity of monoamines (serotonin, adrenaline and dopamine) in the central nervous system and this might be one possible mechanism by which this occurs in AD. A possible impact on the [hypothalamic pituitary adrenal (HPA)] axis, thought to be involved in stress reactions and in MDD, might also be a possibility although there is little firm evidence in the literature to support this in the case of AD.
65.	Casey et al., 2013	3	"Since suicidal ideation and behavior is common in those with AD, it is also of clinical relevance to identify whether pharmacological agents assist in reducing these."
66.	Casey, 2014	1	"Research is lacking in many aspects of AD, especially their biological underpinnings and treatments."
67.	Casey, 2014	1	"There is no guidance on the distinction from normal stress reactions, it remains a subthreshold category, and the subtypes are not strongly underpinned by research."
68.	Casey, 2014	1	"Absence of adequate diagnostic interview schedules…"
69.	Casey, 2014	1	"Apart from epidemiological studies in those with medical illnesses, recent prevalence studies in other populations are scarce."
70.	Casey, 2014	3	"Various subtypes have been included in DSM-5. These include AD with depressed mood, with anxiety and with disturbance of conduct, and they remain the same as in DSM IV. These have not been the subject of much research."
71.	Casey, 2014	3	"In terms of types of life events, it has been shown that stressors involving marital problems are the most common type of stressor associated with AD whereas interpersonal and familial stressors are more common in MDD."
72.	Casey, 2014	4	"The pathway by which stressful events lead from a normal adaptive reaction to one that it clinically significant needs to be explored if we are not to stand accused of medicalizing problems of living."
73.	Casey, 2014	5	"There have been few developments in understanding the psychobiological underpinnings of AD and how these differ from other stress related disorders of from normal stress responses."
74.	Casey, 2014	5	"While significant research has been conducted into [the HPA axis'] role in depressive illness, anxiety and chronic "stress", little research is available to illuminate the way for those working in the field of AD."
75.	Casey, 2014	5	"A further suggestion from these authors is the study of gene×environment interactions to shed light on the role of biology and environment in vulnerability and resilience and how these differ or overlap with other similar psychiatric conditions."

Table D2. Continued

#	Source	Page	Needs Statements
76.	Casey, 2014	5	"A diagnostic instrument currently in press, the Diagnostic Interview for Adjustment Disorder (DIAD)…this study is the first effort at validation. It remains to be seen how well it performs in clinical studies."
77.	Casey, 2014	5	"Yet evidence for the benefit of antidepressants in the treatment of AD with depression subtype is scarce."
78.	Casey, 2014	6	"Resilience-enhancing techniques might also play a role…Clearly further studies specifically in those with AD are necessary."
79.	Casey, 2014	6	"Overall the quality of these [herbal or alternative remedies] studies is poor and no conclusions can be drawn with any degree of conviction regarding the efficacy of these interventions in AD."
80.	Casey, 2014	6	"There is now an attempt to develop an online cognitive therapy intervention for AD but its benefit remains to be fully evaluated."
81.	Fielden, 2012	1022	"Adjustment disorder was the most common behavioral health diagnosis identified in the military deployed setting, but had the least amount of validated clinical guidelines on management strategies."
82.	Fielden, 2012	1022	"Recommendations for the management of adjustment disorder were greatly needed…"
83.	Fielden, 2012	1026	"More evidence from deployed health care providers is necessary to confirm the differences between treatments of adjustment disorders in the military setting vs. the civilian setting."
84.	Fielden, 2012	1026	"Despite the prevalence and severity, adjustment disorder has not received the attention in military behavioral health research. The clinical recommendations and treatment algorithm developed was proposed based on the best literature currently available. More clinical trials with service members diagnosed with adjustment disorder are necessary."
85.	Fielden, 2012	1026	"Since adjustment disorders are expected to naturally improve, identifying preventive interventions that would possibly isolate individuals from developing stress-related injuries could be developed. It would also be important to have a descriptive study of behavioral health care provider's perceptions of how they currently treat adjustment disorders in military settings.'
86.	Israelashvili, 2012	579	"The DSM classification of an adjustment disorder is frequently criticized for not being well differentiated from other disorders."
87.	Israelashvili, 2012	579	"A possible reason for this is the vague definition of the term adjustment in social science literature."
88.	Israelashvili, 2012	579	"…knowledge about ADs is extremely limited."
89.	Israelashvili, 2012	579	"Interestingly, the DSM-V Proposed Draft Revisions to DSM Disorders and Criteria offer a slightly different definition of AD [compared to DSM-IV-R]."
90.	Israelashvili, 2012	580	"…it might not be possible to establish evidence-based helping approaches for people with an AD, nor a consensus on the AD client's specific problem and ways to help him/her."
91.	Israelashvili, 2012	580	"…in DSM- IV-R, an AD would be chosen only "if the stress-related disturbance does not meet the criteria for another specific Axis I disorder and is not merely an exacerbation of a preexisting Axis I or Axis II disorder."
92.	Israelashvili, 2012	580	"The DSM-V goes one step further and does not limit the AD definition to Axis I or Axis II only; namely, an AD would be chosen "once the stress related disturbance does not meet the criteria for another specific mental disorder and is not merely an exacerbation of a preexisting mental disorder."
93.	Israelashvili, 2012	580	"…[this DSM-V definition] means not only that the AD diagnosis would be only selected if there is no better choice but rather that it would include all kinds of mental health problems that have a specific characteristic in common: they are not understandable (or classified)."
94.	Israelashvili, 2012	580	"…literature on an AD indicates that its conceptualization is unclear."

Table D2. Continued

#	Source	Page	Needs Statements
95.	Israelashvili, 2012	580	"Researchers highlight the conflicting data concerning the differences between an AD and depression."
96.	Israelashvili, 2012	580	"Frequently, adjustment is defined through its antonym; i.e. as long as the person does not exhibit signs or syndromes of maladjustment, it is assumed that s/he has adjusted well."
97.	Israelashvili, 2012	581	"The significant gap between the frequent use of the term "adjustment" and the common reliance on the absence of maladjustment as an indication of the presence of adjustment is misleading."
98.	Israelashvili, 2012	581	"The literature on stress and coping adds more confusion to debates on the definition of adjustment, as it does not supply a clear distinction between the terms coping, adaptation and adjustment."
99.	Israelashvili, 2012	586	"The current DSM classification of an AD is criticized due to its overlap with other disorders."
100.	Israelashvili, 2012	586	"…a sequential step would be to reconsider the reliability and construct validity of existing diagnostics tools of ADs."
101.	Kazlauskas, Zelviene, Lorenz, Quero, & Maercker, 2018	1	"More studies and insights from clinical practice are needed to move the field of AD research and practice forward."
102.	Kazlauskas et al., 2018	5	"…the AD structure might need additional symptoms in the future to capture the full clinical picture of AD."
103.	Kazlauskas et al., 2018	6	"Further validation of the [Adjustment Disorder New Module (ADNM)], with test-retest reliability analysis and cross-cultural studies, or the development of a new more appropriate measure is needed."
104.	Kazlauskas et al., 2018	6	"Further studies of AD symptom structure in other samples, and particularly in clinical groups, are needed."
105.	Kazlauskas et al., 2018	6	"So far, empirical data do not provide enough support for the ICD-11 definition of AD symptom structure. None of the analyzed studies attempted to compare ICD-10 and ICD-11 AD diagnostic criteria."
106.	Kazlauskas et al., 2018	6	"The position of AD among other mental disorders remains largely unclear."
107.	Kazlauskas et al., 2018	6	"Even if AD would be diagnosed based on an exclusion criterion when the symptoms of an individual do not fully meet criteria of another disorder, such as PTSD or depression, clinicians and researchers need measures to identify if AD symptoms are clinically significant."
108.	Kazlauskas et al., 2018	6	"Only a few AD intervention studies were available prior to the ICD-11 proposals. After the ICD-11 proposals, there is still very limited data available on treatment of ICD-11 AD."
109.	Kazlauskas et al., 2018	6	"…there is still very limited data available on treatment of ICD-11 AD."
110.	Kazlauskas et al., 2018	7	"The available ADNM measure needs further validation in clinical samples and in a cross-cultural context to be truly useful for clinicians."
111.	Kazlauskas et al., 2018	7	"The DSM and the ICD have similarities in AD criteria. However, incongruencies in major diagnostic classifications in the future could result in a diverse understanding of AD across different countries and professionals, depending on their use of the DSM versus the ICD in clinical practice and research."
112.	Kazlauskas et al., 2018	7	"…updates of AD definition in ICD-11 could significantly contribute to the advancement of AD understanding. Still, there is a need for more studies and insights from clinical practice to move the field of AD research and practice forward."
113.	Kazlauskas et al., 2018	7	"A recent survey of mental health practitioners indicated that clinicians are having difficulties with ICD-11 AD symptom identification."
114.	Kazlauskas et al., 2018	7	"Structured diagnostic interview of ICD-11 AD symptoms is needed."
115.	Kazlauskas et al., 2018	7	"Diagnostic research criteria for the ICD-11 AD diagnosis could facilitate research in this field and should be developed in the near future."
116.	Kazlauskas et al., 2018	7	"There are no AD evidence based treatment guidelines available so far."
117.	Kazlauskas et al., 2018	7	"The optimal treatment approach of AD remains largely unclear."

Table D2. Continued

#	Source	Page	Needs Statements
118.	Laugharne, van der Watt, & Janca, 2008	51	"…lack of quantifiable or qualifiable guidelines for the concept of a stressor and the question of what constitutes a normal or an excessive response to a particular stressor: for example, what is a 'normal response' to the September 11 attacks?"
119.	Laugharne et al., 2008	51	"A further issue raised relates to the uncertainty of the aetiological role of stressors in minor and major psychiatric diagnoses."
120.	Laugharne et al., 2008	53	"The relationship of adjustment disorder to other psychiatric disorders remains unclear, and a lack of operational diagnostic specificity makes the research effort more difficult."
121.	Laugharne et al., 2008	54	"…in relation to the diagnostic construct of AD, its epidemiology, cause and treatment, much more research is needed before firm conclusions can be drawn on the basis of a substantive evidence base."
122.	Laugharne et al., 2008	54	"Evidence for treatment strategies, however, is generally lacking."
123.	O'Donnell, Metcalf, Watson, Phelps, & Varker, 2018	1	"Future high-quality research in the treatment of adjustment disorder has the potential to make a significant difference to individuals who struggle to recover after stressful events."
124.	O'Donnell et al., 2018	8	"This finding [low/very low GRADE rankings] is consistent with the poverty of high quality of research in the area of adjustment disorder as a whole and is a call to researchers and funders to recognize the importance of conducting research on this diagnosis."
125.	O'Donnell et al., 2018	8	"Further research is very likely to have an important impact on our current understanding of efficacious treatments for adjustment disorder."
126.	O'Donnell et al., 2018	8–9	"Beyond the methodological limitations of the studies, there are a number of other fundamental issues with the current adjustment disorder literature. Specifically, the approach to diagnosing and measuring adjustment disorder was inconsistent across studies."
127.	O'Donnell et al., 2018	9	"…the field will only move forward when the diagnostic vagueness surrounding adjustment disorder is clarified with further research."
128.	O'Donnell et al., 2018	9	"Does treating adjustment disorder prevent the development of more severe disorders?"
129.	O'Donnell et al., 2018	9	"There is little doubt that our understanding of treatments for adjustment disorder will benefit from well-designed treatment trials."
130.	O'Donnell et al., 2018	9	"Would adjustment disorder respond to a lower-dose intervention (e.g., five sessions of [cognitive behavioral therapy])?"
131.	O'Donnell et al., 2018	9	"Given that adjustment disorder can be made up of anxious, depressive, or PTSD symptoms, are there common mechanisms that could be targeted to treat adjustment disorder?"
132.	O'Donnell et al., 2018	9	"The current evidence base for the treatment of adjustment disorder is lacking in sufficiently high quality research."
133.	O'Donnell et al., 2018	9	"The trialling and publishing of high-quality research in the treatment of adjustment disorder has the potential to make a significant difference to community members who struggle to recover after stressful events."
134.	Patra & Sarkar, 2013	N/A	"This disorder is also not included in widely used psychiatric diagnostic instruments like Mini International Neuropsychiatric Interview (MINI) and Composite International Diagnostic Interview (CIDI). In Schedule for Clinical Assessment for Neuropsychiatry (SCAN), there is a provision for coding of adjustment disorder but no guidelines on application have been provided."
135.	Patra & Sarkar, 2013	N/A	"Adjustment disorder criteria are vague and not much helpful in clinical practice."
136.	Patra & Sarkar, 2013	N/A	"Reliability studies of adjustment disorder have been found to be lower than some other psychiatric disorders."
137.	Patra & Sarkar, 2013	N/A	"The second criterion is clinically significant symptoms (in excess what would be expected). The concept of normalcy is vague. What constitutes a normal response varies greatly across culture and social groups."

Table D2. Continued

#	Source	Page	Needs Statements
138.	Patra & Sarkar, 2013	N/A	"A study comparing adjustment disorder and depressive episode failed to identify distinguishing symptom profiles and differences on any specific variable. The disorder lacks a specific symptom profile as its own, and at times is used as a waste basket diagnosis."
139.	Patra & Sarkar, 2013	N/A	"For the bereavement subtype, symptoms may arise within 12 months for adults and 6 months for children after the death of a close relative or friend. The severity criterion in view of the shift toward dimensionality in DSM-V is still to be finalized as of writing of this text. The work group also proposes persistent complex bereavement disorder for further study in Section III, which encompasses conditions that require further research."
140.	Patra & Sarkar, 2013	N/A	"Adjustment disorder is a common psychiatric disorder, but has received limited attention in research settings. Many pitfalls in diagnostic criteria need to be addressed, though the concept has fair utility in the clinical setting."
141.	Patra & Sarkar, 2013	N/A	"Large population based data about adjustment disorders have been sparse. Methodologically rigorous large epidemiological surveys like those of Epidemiological Catchment Area, National Co-morbidity Survey, and National Psychiatric Morbidity Survey do not evaluate adjustment disorder."
142.	Pierre, 2012	654	"Indeed, a significant overhaul of adjustment disorders as a more reliable, narrowly defined, and clinically useful diagnostic category is in order. Ideally, a future scientific model of how stress and resilience interact to maintain a homeostatic balance between mental health and mental illness will be integrated into the diagnostic understanding of all psychiatric disorders. When that occurs, a discrete category for adjustment disorders may become obsolete."
143.	Pierre, 2012	655	"Although the category of adjustment disorders was created, in part, to allow for the diagnostic coding of subthreshold disorders, the diagnosis of an adjustment disorder occurs most commonly in primary care and consultation-liaison psychiatry rather than in psychiatric practice. This can be explained both by the stressful impact of medical disorders and by patients tending not to seek psychiatric care for adjustment disorders, as well as by the likelihood that an adjustment disorder is misdiagnosed as a depressive disorder, both in epidemiologic studies and by psychiatrists in clinical practice for the purposes of reimbursement."
144.	Rayner et al., 2010	24	"The role of physical illness severity in mediating responsiveness [of depressive disorders, including AD] to antidepressants warrants further investigation."
145.	Rayner et al., 2010	24	"Future research should seek to determine the threshold of depression severity above which it is beneficial to treat with an antidepressant. RCTs comparing the efficacy of antidepressants and psychological therapies in this population [of people with comorbid physical illness] are needed, and the impact of antidepressants on physical health outcomes, particularly related to function and quality of life should be evaluated."
146.	Semprini, Fava, & Sonino, 2010	383	"Adjustment disorder in childhood and adolescence portends poor outcome and significant psychiatric morbidity."
147.	Semprini et al., 2010	385	"…there is a high association between adjustment disorder and suicidal behavior. Indeed, adjustment disorder with depressive mood is the most common diagnosis in suicide attempts in young people. In psychological autopsy studies, the prevalence of adjustment disorder among suicide victims ranged between 5% and 36%. A retrospective analysis of 119 cases of adjustment disorder diagnosis showed that 72 patients (60.5%) had documented suicide attempts in the past, 96% had been suicidal during their admission to the hospital, and 50% had attempted suicide before their hospitalization."
148.	Semprini et al., 2010	385	"By definition, there is expectation of a good outcome in adjustment disorder, with symptoms remitting after the Stressor is removed."
149.	Semprini et al., 2010	385	"There is little information about biological markers of adjustment disorder."

Table D2. Continued

#	Source	Page	Needs Statements
150.	Semprini et al., 2010	385	"Patients with adjustment disorder had a lower risk of relapse than those with major depression or anxiety disorders. They required less treatment, were able to return to work sooner, and were less likely to manifest a recurrence of the disorder."
151.	Semprini et al., 2010	387	"…there are reports indicating that patients with this diagnosis tend to be younger on average than subjects with other psychiatric disorders. In a recent study on adolescents 12–22 years of age, adjustment disorder was the second most common diagnosis after mood disorders (among nonpsychotic patients)."
152.	Semprini et al., 2010	387	"A major problem of the current diagnostic category of adjustment disorder is the fact that it is an exclusion diagnosis (it cannot be applied in comorbidity with other psychiatric disorders) and overlaps with subthreshold manifestations of psychological distress that have found more precise clinical descriptions."
153.	Zelviene & Kazlauskas, 2018	377	"The lack of studies is associated with limited resources of valid and reliable measures of AD."
154.	Zelviene & Kazlauskas, 2018	377	"Vague definition of AD in DSM and ICD hindered the development of AD diagnostic tools."
155.	Zelviene & Kazlauskas, 2018	377	"Currently, no established standards of diagnosing AD exist based on DSM and ICD diagnostic criteria."
156.	Zelviene & Kazlauskas, 2018	377	"Measures developed for other conditions and disorders are often applied in diagnosing AD."
157.	Zelviene & Kazlauskas, 2018	378	"Epidemiological data of AD are limited because AD was not included in major national health surveys."
158.	Zelviene & Kazlauskas, 2018	379	"…more research would be needed not only from psychosocial studies but also from neuroscience and genetic or epigenetic studies to provide data for a better understanding of AD."
159.	Zelviene & Kazlauskas, 2018	379	"…there is not enough research to provide evidence about distinction of AD from depressive or other mental disorders."
160.	Zelviene & Kazlauskas, 2018	379	"Diagnosis of AD in clinical practice and research is complicated due to the lack of measures and needs to be addressed in future research."
161.	Zelviene & Kazlauskas, 2018	380	"Longitudinal studies are needed to identify the trajectories of AD symptoms, risk, and protective factors in the future, especially among children and adolescents."
162.	Zelviene & Kazlauskas, 2018	380	"There is little evidence about the effectiveness of psychopharmacological or psychosocial treatments for AD…Development and validation of evidence-based AD psychosocial treatments is very important for clinicians."
163.	Zelviene & Kazlauskas, 2018	380	"More research is needed to implement evidence-based effective AD treatments in clinical practice."

Table D3. Subject Matter Expert Research-Needs Statements

#	Needs Statements
1.	Future research must focus on a more detailed and comprehensive understanding of the clinical nosology, etiology, and treatment of adjustment disorders for Asian populations. Future research must provide a clearer picture of the specific risks or triggers and the development course of this clinical condition in order to help improve the mental health treatment and adjustment outcomes for Asian populations.
2.	Impact of chronic stressors particularly relevant to military, given the culture of "lethality" and potential or reality of deployment.
3.	Replicate and confirm emerging data on promising biomarker candidates and other diagnostic tools for adjustment disorders, including genome-wide associations, plasma molecules, and methylation patterns.
4.	Identify and characterize biomarkers that can predict increased vulnerability to the development of [AD], indicate changes in the spectrum of symptoms associated with worsening function, and demonstrate at the biologic level a positive response to intervention.

Table D3. Continued

#	Needs Statements
5.	Mechanisms underlying the development of [AD] — neuroimaging, animal studies, post-mortem analyses, and laboratory-based investigations focused on identifying physiological and neurochemical contributions, and other psychological, contextual, and environmental factors, including pre-existing conditions
6.	Review emerging genomic and molecular findings on causal pathways and changes that contribute to [AD] and perform critical replication of preliminary findings.
7.	Characteristics — and overlap with other anx/dep or stress/trauma disorders — re: reactivity to startle or classical and contextual conditioning, fear extinction, attentional focus and preoccupation with negative stimuli, LT and ST memory, habituation vs sensitization. Neophobia, mental inflexibility (?), and executive functioning.
8.	Association with temperament, behavioral inhibition (e.g., childhood) a la Jerome Kagan
9.	Fear extinction, novel context, medial PFC
10.	What brain/physiological changes precede a diagnosis of AD?
11.	What is an etiologic reaction to a stressor in terms of AD? Identify stress reactions that cause AD. Consider cognitive, behavioral, and emotional reactions.
12.	Further research is needed to find ways to improve the management of this public and occupational health challenge. It should focus on determining the incidence of adjustment disorder among the working population, the factors associated with the length of sickness absence due to work-related adjustment disorder, and finally the impact of variables such as the type of treatment (e.g., pharmacotherapy versus psychotherapy) and the psychosocial environment at work on sickness absence.
13.	Its epidemiology, cause and treatment, much more research is needed.
14.	Less attention has been paid to the impact of adjustment disorder on the working population and its economic consequences.
15.	Empirical data about the prevalence of adjustment disorders for Asian populations is lacking.
16.	Although biological models to explain adjustments disorders have been proposed in some studies, the empirical evidence for such risk factors is relatively rare.
17.	Are there gender/ethnic differences in adjustment disorder?
18.	Does combat exposure have an effect on incidence and symptom trajectory of adjustment disorder?
19.	What environmental characteristics increase the likelihood of AD or exacerbate an AD episode?
20.	Uncertainty of the aetiological role of stressors.
21.	Research on structural and/or functional changes in the brain immediately following trauma exposure to identify early changes indicative of the future development of [AD] and comorbidities.
22.	Occupational — Impact on job performance (and as a way to distinguish from ~false PTSD Dx?)
23.	Identify the characteristics of a stressful event that are most likely to produce AD (that is what is the etiological significance of a stressor to AD) — This is a very broad topic that could include multiple gaps (e.g., severity of stressor, type, duration, etc.)
24.	What treatments are effective for different subtypes of the condition, e.g., AD with Depression vs. AD with Disturbance of Conduct?
25.	Establish provider guidelines and resources for referrals to address stressors, e.g., case manager, specialty medical clinic, financial mgmt., etc.
26.	Develop and validate population-level educational prevention interventions.
27.	Develop and validate prevention interventions that focus on risk prevention, risk reduction, and resilience building.
28.	Address stigma and barriers to seeking treatment.
29.	Develop and validate effectiveness of early interventions (e.g., psychological debriefing) in preventing adjustment disorder and adverse outcomes associated with it.
30.	Develop and validate screening tools that facilitate early detection of adjustment disorder.
31.	Determine benefits of screening for adjustment disorder as part of post-deployment health assessment.
32.	Test the utility of screening tools in improving outcomes.
33.	Determine optimal conditions/timing for screening.
34.	What treatments are most effective at different stages of the condition?
35.	Investigate AD treatment outcomes to compare sx resolution vs. change in diagnosis.
36.	Develop brief treatments, investigate comparative effectiveness.
37.	Comparative effectiveness of marital/family therapy vs. TAU and/or psychotherapy adapted for AD (CBT, etc).
38.	Establish training guidelines for providers treating AD.
39.	What is the effectiveness of existing psychotherapies for the treatment of AD?

Table D3. Continued

#	Needs Statements
40.	Development of novel psychotherapies/adaptation of existing psychotherapies for other disorders for treatment of AD.
41.	Personalized psychotherapy for AD — which treatments work best for whom? (Patient preference, military, stressor type, comorbid conditions, gender, ethnic group, sexual orientation and gender identity, environment, etc.).
42.	What is the impact of treatment modality/delivery on treatment effectiveness? (Individual vs. group, telemedicine and technology-enhanced psychotherapies).
43.	What is the effectiveness of existing pharmacotherapies for the treatment of AD?
44.	Development and treatment effectiveness of novel pharmacotherapies.
45.	Personalized pharmacotherapy for AD — which treatments work best for whom? (Patient preference, military, stressor type, comorbid conditions, gender, ethnic group, sexual orientation and gender identity, environment, etc.)
46.	What is the effectiveness of complementary and integrative adjunctive therapies for the treatment of AD?
47.	When should complementary and integrative adjunctive therapies be considered?
48.	For whom, when, and how should different treatments be combined? (Psychotherapies, pharmacotherapies, CAM)
49.	What are the side effects/adverse effects associate with different treatments for AD?
50.	What is the treatment retention for different treatments for AD?
51.	What resources are needed to implement different treatments for AD? (cost, time, availability)
52.	Identify biomarkers of treatment effectiveness to aid in personalized treatment of AD/predict treatment response, including protein-based biomarkers (e.g., blood, urine, CSF), imaging-linked biomarkers (e.g., gray matter volume), genetic biomarkers, and inflammatory biomarkers (e.g., cytokines, hormones).
53.	Recent clear guidelines for the treatment of adjustment disorders are lacking.
54.	Lack of research studies that compare the efficacy of different treatment options for adjustment disorders.
55.	Establish CPGs for AD including both psycho- and pharmaco- therapies.
56.	Develop treatment interventions to actively address behaviors to reduce/resolve stressors, and/or increase coping strategies, and to decrease/resolve symptoms.
57.	Establish evidence-based psychotherapies for AD.
58.	Well-designed RCTs to investigate effectiveness of existing psychotherapies for tx of AD vs TAU vs wait list control.
59.	Well-designed RCTs to investigate effectiveness of stress management based approaches (e.g., SIT).
60.	Investigate comparative effectiveness of behavioral activation and/or coaching approach.
61.	In general, the literature on the clinical treatment of adjustment disorders for Asian groups is woefully lacking.
62.	Our current knowledge about adjustment disorders and effective treatment modalities with Asian populations is limited, incomplete, and circumspect at best.
63.	Are telehealth interventions effective in treating adjustment disorder?
64.	Until such robust studies are published, there is no potential for a TechBrief or systematic review to be carried out on adjustment disorder.
65.	The relationship of adjustment disorder to other psychiatric disorders remains unclear.
66.	There is no scientifically based understanding of the way in which MHS mental health and medical practitioners are using this diagnostic category.
67.	There is no scientific understanding of the healthcare transitions which occur in relation to this diagnosis, or the overall outcome for various groups served by providers in the MHS.
68.	There is no qualitative measure of the stressors reported as part of this diagnosis. Given the importance of situational stressors in military life, it might be particularly useful to the MHS to develop more objective (quantitative) ways of evaluating relevant stressors.
69.	While we have some cumulative prevalence and incidence data for AD in the military, we do not know the relative frequency for different health care types (specialty care, primary care, etc.).
70.	Research is needed to explore the effect of adjustment disorder diagnosis on clinical pathways in the MHS. Specifically, how the diagnosis may impact mental health access, treatment decisions, and health outcomes.
71.	Research is needed to identify factors that influence provider decisions to diagnosis adjustment disorder, including patient characteristics, provider factors, and health system elements.
72.	Effectiveness research to determine whether recommended front-line treatments may also be effective for adjustment disorder.
73.	Given the high prevalence of adjustment disorder, research evaluating potential public health interventions that may be effective in preparing service members to manage probable stressors they will encounter during their service.

11.0 Appendix E: Final Refined List of Potential Research Gaps

Table E. Final Refined List of Adjustment Disorder Potential Gaps by NRAP Category

A. Foundational Science		Mean Rating*
1.	Explore biological mechanisms of pharmacological treatment for adjustment disorders	3.38
2.	Explore biological, environmental, and epigenetic factors that increase vulnerability for development of an adjustment disorder	3.09
B. Epidemiology		
3.	Identify valid, reliable, and specific diagnostic and symptom criteria for adjustment disorders	3.29
4.	Investigate epidemiological risk factors for developing adjustment disorders, including personality factors and military-specific factors such as combat	4.13
5.	Investigate demographic and culture-specific factors of adjustment disorders	3.27
6.	Identify reliable incidence and prevalence estimates of adjustment disorders	3.36
C. Etiology		
7.	Examine the cognitive, behavioral, and emotional pathways by which stressful events cause adaptive vs. maladaptive responses (e.g., vulnerability vs. resilience) which rise to the level of an adjustment disorder	4.10
8.	Investigate the characteristics of stressors that are associated with adjustment disorders, including type, severity, and duration of stressor, and the environment in which stressors occur	4.00
D. Prevention and Screening		
9.	Identify and test preventive interventions related to stress response; including primary interventions that address the stressor, secondary interventions that address the adjustment response, and tertiary interventions that address advanced adjustment reaction stages or more serious mental health problems (e.g., population-level, educational, resilience-building interventions)	4.60
10.	Identify valid and reliable screening and assessment measures and gold-standard interviews for adjustment disorders that are informed by emerging research on diagnostic criteria of adjustment disorders and that are useful for research and clinical practice	4.09
11.	Address early intervention for adjustment disorders, e.g., interventions aimed at reducing stigma and removing barriers to services	4.27
E. Treatment		
12.	Identify effective psychotherapy and pharmacotherapy interventions for adjustment disorders that consider stressor, setting, and subtype (including combination approaches and brief/low-intensity approaches)	4.44
13.	Identify effective alternative treatment approaches or modalities for adjustment disorders (including complementary and integrative adjunctive, telemedicine, somatic, marital/family, and group therapies)	4.00
14.	Identify personalized and enhanced treatment for adjustment disorders in consideration of patient preference, setting, stressor type, demographics, culture, co-morbid conditions, and military environment	4.18
F. Follow-Up Care		
15.	Elucidate the longitudinal trajectories of adjustment disorders (i.e., does it remit, become chronic, or change to a more severe diagnosis?)	4.00
16.	Measure effects of adjustment disorders on interpersonal functioning, quality of life, occupational performance, and readiness	3.64
17.	Investigate the relationship between adjustment disorders diagnosis and suicide risk in the military	4.36
G. Services Research		
18.	Determine optimal tools, conditions, and timing for adjustment disorders screenings within medical and non-medical settings	3.18
19.	Investigate the effects of the adjustment disorders diagnosis on healthcare utilization and outcomes in the MHS	3.33

Table E. Continued

H. Potential Gaps with a rating below 3.00 and not included in gaps analysis	
20.	Investigate the biological and physiological underpinnings of adjustment disorders
21.	Differentiate the biological and physiological properties of adjustment disorders from other psychological health conditions
22.	Characterize the biological and physiological properties of adjustment disorder subtypes
23.	Investigate discriminant validity of adjustment disorder subtypes
24.	Compare the type and range of stressors associated with adjustment disorders and its subtypes with stressors associated other mental health conditions
25.	Examine in which setting (e.g., primary care) adjustment disorders are diagnosed, reasons why they are diagnosed in that setting, and in which setting they should be managed
26.	Investigate the effects of patient, provider, and setting variables on application of adjustment disorders diagnosis

*Mean scores of 11 voting stakeholders. Rating scale 1 (very low) to 5 (very high).

12.0 Appendix F: Rationale for Retaining, Revising, or Removing Potential Gaps (After Reviewing Published Literature)

Table F. Rationale for Retaining, Revising, or Removing Potential Gaps

#	Potential Gaps	Decision and Rationale (Retained, Revised, or Removed)	Final Gaps
1	Explore biological mechanisms of pharmacological treatment for adjustment disorders	**Remove.** Basic science on biological correlates of AD* is not mature enough to initiate research into pharmacological mechanisms underlying treatment for AD. Also, extant pharmacological interventions are targeted at symptoms of AD that are also present in other disorders (e.g., depression and anxiety), which precludes engaging in research into unique mechanisms of targeted pharmacological action for AD. Research in mood and anxiety disorders is sufficient to address pharmacological action specific to symptoms of mood and anxiety disorders.	N/A
2	Explore the effects of gene-environment interactions, epigenetics, and pre-existing factors on vulnerabilities for and consequences of adjustment disorders	**Revise.** Environmental element was removed due to overlap with Gap 4.	Examine biological, including epigenetic, factors that increase vulnerability for development of adjustment disorders
3	Identify valid, reliable, and specific diagnostic and symptom criteria for adjustment disorders	**Retain.** Wording modifications.	Examine the validity and reliability of diagnostic criteria for adjustment disorders
4	Investigate epidemiological risk factors for developing adjustment disorders, including personality factors and military-specific factors such as combat	**Revise.** Gap 5 demographic and cultural factors will be included in this gap.	Investigate the interactions of psychosocial and environmental pre-existing factors with the stressor in predicting the development of adjustment disorders
5	Investigate demographic and culture-specific factors of adjustment disorders	**Remove.** This gap is included in Gap 4 on effects of psychosocial factors on AD.	N/A
6	Determine reliable incidence and prevalence estimates of adjustment disorders	**Remove.** Sufficient research exists: Incidence rate is well documented among U.S. Armed Forces by two MSMR articles. Prevalence data can be calculated by figures provided by AFHSB.	N/A
7	Examine the cognitive, behavioral, and emotional pathways by which stressful events cause adaptive vs. maladaptive responses (e.g., vulnerability vs. resilience) which rise to the level of an adjustment disorder	**Revise.** Original gap intent was about identifying adaptive or maladaptive responses to the stressor. This is now better expressed with a major wording modification.	Investigate adaptive and maladaptive stress responses that predict development of adjustment disorders
8	Investigate the characteristics of stressors that are associated with adjustment disorders, including type, severity, and duration of stressor, and the environment in which stressors occur	**Revise.** Wording modifications.	Identify the defining characteristics (e.g., context, duration, and severity) of stressor types that precipitate adjustment disorders

Table F. Continued

#	Potential Gaps	Decision and Rationale (Retained, Revised, or Removed)	Final Gaps
9	Interventions related to stress response; including primary interventions that address the stressor, secondary interventions that address the adjustment response, and tertiary interventions that address advanced adjustment reaction stages or more serious mental health problems (e.g., population-level, educational, resilience-building interventions)	**Revise.** There are no studies of primary prevention interventions examining AD as an outcome, so this remains a gap. Secondary prevention may not be feasible given inadequate screening tools and problems with definition and diagnostic criteria of AD. Tertiary prevention is addressed under treatment.	Develop and test the effectiveness of interventions that address reaction to the stressor in preventing adjustment disorders
10	Identify valid and reliable screening and assessment measures and gold-standard interviews for adjustment disorders that are informed by emerging research on diagnostic criteria of adjustment disorders and that are useful for research and clinical practice	**Revise.** Wording modification.	Develop valid and reliable screening and assessment measures for adjustment disorders
11	Address early intervention for adjustment disorders, e.g., interventions aimed at reducing stigma and removing barriers to services	**Remove.** Incorporated into Gap 19.	N/A
12	Identify effective psychotherapy and pharmacotherapy interventions for adjustment disorders that consider stressor, setting, and subtype (including combination approaches and brief/low-intensity approaches)	**Revise.** Wording modification	Examine psychotherapy and pharmacotherapy interventions for adjustment disorders that consider stressor, setting, and subtype (including combination and brief/low intensity approaches)
13	Identify effective alternative treatment approaches or modalities for adjustment disorders (including complementary and integrative adjunctive, telemedicine, somatic, marital/family, and group therapies)	**Remove.** As there is insufficient high quality treatment research of any kind, it is premature to single out alternative treatments. There is sufficient overlap with "brief/low intensity" approaches in Gap 12.	N/A
14	Identify personalized and enhanced treatment for adjustment disorders in consideration of patient preference, setting, stressor type, demographics, culture, co-morbid conditions, and military environment	**Remove.** Without established front-line treatments, this gap is premature. Aspects of this gap that are important to development and testing of treatments are covered in Gap 12 (e.g., stressor and setting).	N/A
15	Elucidate the longitudinal trajectories of adjustment disorders (i.e., does it remit, become chronic, or change to a more severe diagnosis?)	**Retain.**	Elucidate the longitudinal trajectories of adjustment disorders (i.e., does it remit, become chronic, or change to a more severe diagnosis?)
16	Measure effects of adjustment disorders on interpersonal functioning, quality of life, occupational performance, and readiness	**Remove.** Elements of this gap were considered sufficiently addressed by Gaps 12 and 15 and General Recommendations.	N/A

Table F. Continued

#	Potential Gaps	Decision and Rationale (Retained, Revised, or Removed)	Final Gaps
17	Investigate the relationship between adjustment disorders diagnosis and suicide risk in the military	Remove. This gap was proposed due to findings of an association between AD and psychiatric hospitalizations and between AD and suicide. After further review, it was dropped as a gap because the associations appear to be spurious. AD are preceded by a stressor that overwhelms the individual's coping resources. Suicidal behavior and psychiatric hospitalizations often have precipitating stressors, leading us to assume the association between suicide and AD is incidental to both being associated with stressors. As the association is potentially important for systemic approaches to suicide prevention, it was integrated into other gaps as supplemental information.	N/A
18	Determine optimal tools, conditions, and timing for adjustment disorders screenings within medical and non-medical settings	**Revise.** The "tools" element was redundant with other gaps and was removed. Specifying medical and non-medical settings was removed and included in the "to consider" information.	Identify optimal settings and timing for adjustment disorders screenings
19	Investigate the effects of the adjustment disorders diagnosis on healthcare utilization and outcomes in the MHS	**Revise.** Incorporated Gap 11 elements. Wording modifications.	Investigate the effects of adjustment disorders diagnoses on treatment engagement, care pathways, healthcare utilization and functional outcomes

AD* = Adjustment Disorders

13.0 Appendix G: General Research Recommendations (adapted from PHCoE, 2017; PHCoE, 2018)

1. Measure and report relevant secondary outcomes, such as functional impairment, quality of life, fitness for duty, and other military-relevant outcomes, as well as outcome measures that assess clinically relevant change.
2. Measure adverse events, harms, and occurrences of suicidal ideation in both pharmacological and psychotherapeutic trials.
3. Use novel methodologies that incorporate sophisticated study designs.
4. Use common data elements and maintain individual subject-level data in order to facilitate retrospective meta-analytic studies.
5. Track sex/gender and racial/ethnic differences and include results (including lack of differences) in reports and publications.
6. Track longitudinal outcomes with at least one year of follow-up, and include active duty status to veteran status when appropriate.
7. Evaluate implementation and dissemination concerns, including cost-effectiveness of interventions, strategies, and models of continuing care.
8. Consider the potential of telehealth and mobile technologies to improve access and enhance quality of care.