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PI Name:	Rose, Raphael Ph.D.		
Project Title:	Asynchronous Behavioral Health Treatment Techniques		
Division Name:	Human Research		
Program/Discipline:			
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Behavior and performance		
Joint Agency Name:	TechPort:	No	
Human Research Program Elements:	(1) HFBP :Human Factors & Behavioral Performance (IRP Rev H)		
Human Research Program Risks:	(1) BMed :Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Comments:			
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No. of Bachelor's Candidates:		Monitoring Center:	NASA JSC
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Flight Program:			
Flight Assignment:	NOTE: Element change to Human Factors & Behavioral Performance; previously Behavioral Health & Performance (Ed., 1/18/17)		
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Craske, Michelle Ph.D. (University of California Los Angeles) Wu, Peggy M.S. (Smart Information Flow Technologies, LLC)		
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Task Description:	<p>There are many potential challenges and dangers in carrying out human spaceflight. From a behavioral health standpoint, stress and anxiety-related problems, fatigue/sleep disturbance, and interpersonal conflict, are common problems that can arise for those working in operational environments. Such problems, if not addressed in advance via training, can potentially escalate into significant problems (i.e., anxiety disorder, depressive episode, severe sleep disturbance or conflict) that can seriously impact performance, safety, and well-being. Furthermore, exploration missions present unique challenges to addressing behavioral health issues due to communication delays where real-time communication limitations could hamper the delivery of behavioral health support. The NASA Human Research Roadmap (HRR) identifies the following risks involved with human spaceflight relevant to Behavioral Health and Performance: “Risk of Adverse Behavioral Conditions and Psychiatric Disorders; Risk of Performance Decrements due to Inadequate Cooperation, Coordination, Communication, and Psychosocial Adaptation within a Team; and Risk of Performance Errors Due to Fatigue Resulting from Sleep Loss, Circadian Desynchronization, Extended Wakefulness, and Work Overload.” The NASA Human Research Program Integrated Research Plan (IRP) also identified the following potential gaps in training; “BMed1: We need to identify and validate countermeasures that promote individual behavioral health and performance during exploration class missions. “BMed6: We need to identify and validate effective treatments for adverse behavioral conditions and psychiatric disorders during exploration class missions.” This proposal addresses these risks and gaps by examining and evaluating existing behavioral health techniques and determining the best practices for addressing behavioral health concerns that could arise on exploration missions. Our final research product will comprise several components. The main deliverable will be data from a randomized controlled trial (RCT) examining the efficacy, feasibility, and acceptability of asynchronous behavioral techniques in comparison to traditionally delivered psychotherapy (i.e., videoconference) focusing on a behavioral health condition of relevance to spaceflight (i.e., stress, depression, or anxiety). The behavioral health techniques examined are evidence-based (e.g., cognitive-behavioral therapy--CBT) and do not consist of new or unvalidated treatments. The RCT is being conducted at UCLA with high functioning participants (i.e., UCLA Medical Center personnel or medical students) who report current symptomatology (i.e., stress, anxiety, or depressive symptoms). The techniques examined in the RCT were selected, in part, by conducting a comprehensive review of current standards of behavioral health practice for spaceflight, including consultation with behavioral health clinicians at NASA Johnson Space Center (JSC) and subject matter experts. We also conducted a systematic review of the literature of behavioral health approaches, (e.g., computer-guided, bibliotherapy, smart phone apps) suitable for use in an asynchronous communication environment, in comparison to traditional psychotherapy. Based on information from our reviews and data from the RCT, we will formulate a “best practice guidelines” for addressing behavioral health issues of relevance to exploration missions where communication delays are a concern. The best practice guidelines will comprise behavioral health training and treatment that address pre-mission, mission, and post-mission phases of exploration class missions.</p>
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	<p>This project will deliver a set of best-practice guidelines to NASA regarding behavioral health treatment techniques for potential future long-duration exploration-class missions. The best practice guidelines will be based on subject matter expert interviews, literature reviews, and data from a randomized controlled trial comparing web-based delivery of cognitive behavioral therapy to real-time delivered therapy among high-functioning individuals with symptoms of anxiety, depression, and/or stress. Anxiety, depression, and stress are some of the most common and costliest behavioral health conditions on Earth, but most people who need or seek treatment do not receive appropriate evidence-based care. Increased knowledge on evidence-based behavioral health treatments that do not require synchronous communication can potentially result in improved access to such behavioral healthcare for the broader US population.</p>
Task Progress:	<p>The majority of work during the past (second) year of this project has been spent on various aspects of preparing and implementing a randomized controlled trial (RCT) among a sample of high-functioning medical personnel (i.e., medical students, residents, or faculty) at the University of California, Los Angeles (UCLA). The RCT examines the efficacy, acceptability, and usability of asynchronously delivered cognitive behavioral therapy web-based program called This Way Up: The Worry and Sadness Program, in comparison to a video-conference (real-time) delivered version of the This Way Up program.</p> <p>Our progress this year covered several areas, including selecting the asynchronous behavioral health treatment program based on an extensive literature review and several evaluations of potential programs conducted the previous year, developing a treatment protocol for matching the asynchronous treatment in the in-person condition, training two advanced clinical psychology PhD students in delivering the treatment to the in-person condition, obtaining IRB (Institutional Review Board) approvals from NASA JSC and UCLA to conduct the RCT, monthly teleconferences with NASA Behavioral Health and Performance (BHP) personnel to address various areas of study implementation, bimonthly teleconferences with co-investigators from different institutions to maintain regular communication, and selecting measures to assess treatment outcomes, and creating assessment protocols, and training research assistants in completing assessment procedures. Measures of treatment outcome include three computerized tasks designed to evaluate distress tolerance, willingness to work for reward, and approach and avoidance tendencies, self-report questionnaires assessing areas such as mood, physical symptoms, impairment, emotion regulation, sleep, personality, and demographic variables, and a diagnostic interview pertaining common psychological problems such as anxiety, depression, and substance use. Two research assistants were trained in administration of a psychiatric diagnostic interview (i.e., MINI: Mini International Neuropsychiatric Interview). During and after treatment we also measure therapist alliance, treatment credibility, usefulness, and usability in both conditions.</p> <p>Participant recruitment is addressed by the UCLA team in collaboration with associates at the UCLA Medical School and Medical Center. The study is being advertised via targeted emails and flyers in designated areas in the Medical Center. We began recruitment in January 2017 and at the time of this report, 97 people have expressed interest in participating in the study, 87 of those have been screened for eligibility, and 47 have met inclusion criteria. So far, 40 people have been randomized, 20 in each condition, and 14 people have completed the treatment phase of the study. Our final aim is at least an N of 70 participants.</p>
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