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| <b>Fiscal Year:</b>                               | FY 2018   | <b>Task Last Updated:</b>             | FY 05/21/2018  |
| <b>PI Name:</b>                                   | Rose, Raphael Ph.D.   |                                       |  |
| <b>Project Title:</b>                             | Asynchronous Behavioral Health Treatment Techniques   |                                       |  |
| <b>Division Name:</b>                             | Human Research  |                                       |  |
| <b>Program/Discipline:</b>                        |   |                                       |  |
| <b>Program/Discipline--Element/Subdiscipline:</b> | HUMAN RESEARCH--Behavior and performance  |                                       |  |
| <b>Joint Agency Name:</b>                         | <b>TechPort:</b>  | No                                    |  |
| <b>Human Research Program Elements:</b>           | (1) <b>HFBP</b> :Human Factors & Behavioral Performance (IRP Rev H)   |                                       |  |
| <b>Human Research Program Risks:</b>              | (1) <b>BMed</b> :Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders   |                                       |  |
| <b>Space Biology Element:</b>                     | None  |                                       |  |
| <b>Space Biology Cross-Element Discipline:</b>    | None  |                                       |  |
| <b>Space Biology Special Category:</b>            | None  |                                       |  |
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| <b>Zip Code:</b>                                  | 90095-1563  | <b>Congressional District:</b>        | 33   |
| <b>Comments:</b>                                  |   |                                       |  |
| <b>Project Type:</b>                              | GROUND  | <b>Solicitation / Funding Source:</b> | 2014-15 HERO NNJ14ZSA001N-Crew Health (FLAGSHIP & NSBRI) |
| <b>Start Date:</b>                                | 07/20/2015  | <b>End Date:</b>                      | 07/19/2019   |
| <b>No. of Post Docs:</b>                          |   | <b>No. of PhD Degrees:</b>            | 1  |
| <b>No. of PhD Candidates:</b>                     | 2   | <b>No. of Master' Degrees:</b>        |  |
| <b>No. of Master's Candidates:</b>                |   | <b>No. of Bachelor's Degrees:</b>     |  |
| <b>No. of Bachelor's Candidates:</b>              |   | <b>Monitoring Center:</b>             | NASA JSC   |
| <b>Contact Monitor:</b>                           | Williams, Thomas  | <b>Contact Phone:</b>                 | 281-483-8773   |
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| <b>Flight Program:</b>                            |   |                                       |  |
| <b>Flight Assignment:</b>                         | NOTE: End date changed to 7/19/2019 per NSSC information (Ed., 8/9/18)<br>NOTE: Element change to Human Factors & Behavioral Performance; previously Behavioral Health & Performance (Ed., 1/18/17) |                                       |  |
| <b>Key Personnel Changes/Previous PI:</b>         |   |                                       |  |
| <b>COI Name (Institution):</b>                    | Craske, Michelle Ph.D. ( University of California Los Angeles )<br>Wu, Peggy M.S. ( United Technologies )   |                                       |  |
| <b>Grant/Contract No.:</b>                        | NNX15AP57G  |                                       |  |
| <b>Performance Goal No.:</b>                      |   |                                       |  |
| <b>Performance Goal Text:</b>                     |   |                                       |  |

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| <p><b>Task Description:</b></p>                    | <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 where asynchronous communication can be a barrier to delivering real-time behavioral healthcare. 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 videoconference-delivered psychotherapy focusing on a behavioral health condition of relevance to spaceflight (i.e., stress, depression, and/or anxiety). The behavioral health techniques examined are evidence-based (e.g., cognitive-behavioral therapy--CBT), transdiagnostic in content, 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, and/or depressive symptoms, and functional impairment). 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 in-person 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> |
| <p><b>Rationale for HRP Directed Research:</b></p> | <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 healthy and 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 due to barriers to access in care, such as logistics of schedules, stigma, and finding clinicians trained in evidence-based approaches. 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>  |
| <p><b>Research Impact/Earth Benefits:</b></p>      | <p>The majority of work during the past (third) year of this project has been spent on various aspects of 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 enrolling participants into the study, randomizing them to the two treatment conditions, and collecting data as they completed either the This Way Up program or the videoconferencing sessions. We renewed our IRB (Institutional Review Board) approvals from NASA JSC and UCLA to conduct the RCT, participated in monthly teleconferences with NASA Human Factors &amp; Behavioral Performance (HFBP) personnel to address various areas of study implementation, and conducted monthly teleconferences with co-investigators from different institutions to maintain regular communication. We implemented our assessment protocols, which included 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. Poster presentations on this project were reported at several scientific conferences.</p> <p>Participant recruitment is addressed by the UCLA team in collaboration with collaborators 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.</p> <p>We began recruitment in January 2017 and at the time of this report, 260 people have expressed interest in participating in the study, 235 of those have been screened for eligibility, and 127 have met inclusion criteria. Of those, 123 have completed a clinical phone interview and 109 have completed the pre-assessment. So far, 104 participants have been randomized, 51 in the online CBT condition, and 53 in the videoconference condition, and 80 participants have completed the post-assessment. Forty-five participants have completed three-month follow-up questionnaires. Since the</p>   |
| <p><b>Task Progress:</b></p>                       |  |

2017 Task Book report we have randomized 64 additional participants. Overall, we have exceeded our pre-study sample goal of N=70. Enrollment will end in May 2018, and our primary data collection phase will conclude in July 2018, with three-month follow-ups continuing until October 2018.

**Bibliography Type:**

Description: (Last Updated: 02/11/2021)