

Challenges of Life Support - Medical Support for Manned Space Exploration (9)  
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MINDFUL MEDITATION AND YOGA AS POSSIBLE COUNTERMEASURES FOR MAINTAINING  
OPTIMUM PSYCHOLOGICAL HEALTH IN MARS ANALOG ASTRONAUTS SIMULATION  
MISSIONS DURING ISOLATION AND CONFINEMENT

**Abstract**

Analog astronauts conduct scientific research in human performance, human factors including testing innovative concepts and technologies within a limited and restricted setting that requires the small crew to live in a fully immersive Mars simulation in isolated and confined remote settings like the Mars Society's Mars Desert Research Station, (MDRS) located in Utah desert, USA. These types of conditions incur additional physical, psychological and mental stressors to the individual and potentially impact crew cohesion and quality of crew performance over the duration of the mission. Thus, it necessitates developing countermeasures to mitigate possible negative problems that could arise under such conditions due to increase tensions, anxiety or conflicts. The main objective of the pilot study was to explore the integration of complementary medicine, such as, mindfulness meditation and yoga, as possible mitigation countermeasures into the daily schedule of the analog astronaut crews rotating at MDRS. Volunteered participants were introduced to "familiarization" sessions during "pre-sim" for the meditation sessions and basic yoga protocols prior to start of each simulation. A "baseline" status determined.

MEDITATION - Study used the online pre-programmed audio guided meditation programs from U.C.L.A Mindful Awareness Research Center (MARC) during the meditation sessions. Mindful awareness has shown to be an excellent antidote to stressors and users can be trained to stop, breathe, observe, and connect with the person's internal experiences. The daily 20-30 minute sessions were conducted in the evenings and led by a crew medical officer.

YOGA - A crew member experienced in yoga was assigned to lead the daily morning sessions. Each session lasted 30 minutes. Crew members completed daily questionnaires after each session to document subjective feedback, self-evaluation and data was collected for analysis. Separate crew video interview recordings were obtained at the end of the mission. The information gathered were qualitative, non-systematic, voluntary subjective reactions.

\*Subsequent, mission crews were permitted to use virtual reality "I am Cardboard" goggles to perform the meditation and yoga sessions individually.

The anecdotal observations could provide the basis of future systematic studies in longer duration analogue simulations. The long-term objective are to develop and expand the project into a more comprehensive research study to include modalities such as Tai Chi, acupuncture. As humans we are complex organisms with socio-psychological challenges. We must address the components that truly makeup the whole person - Body, Mind and Spirit. Therefore, an integrative approach in mental wellness for space exploration is needed.