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Abstract

Research on spaceflight is a difficult and costly affair. Not all the experiments can be performed in the high sterile conditions of the outer space. There are lot of constraints with respect to time, budget, equipment, and human resources that frequently impede such attempts. To mitigate these issues, researchers reload themselves with the help of analogs. These are places on the Earth which in some of their properties simulate some conditions of outer space. It is important to do this in order to decide what measures and technologies are more effective before implementing the resources on a real space mission. Earth-based analog studies also have their own specific advantages. Time taken to perform an analog experiment is far less as compared to a space mission as well as conducting research in space is highly expensive as compared to performing experiments on earth. Also, space simulation experiments act out the conditions of space travel on Earth, providing a better understanding of human performance, psychological adaptation, and team dynamics in a space-like environment. This paper investigates the results of a simulation environment designed to study the habitability and behaviour of crew members in a confined and stressed environment. During the study, there were activities planned which focused on assessing living conditions, resource management, mental health and social well-being of crew members inside the spacecraft. By collecting data of individual and group behavioural patterns, this research aims highlight design changes for future housing design and develop strategies to improve crew performance and health during space missions. Experiments that mimic the activities performed by the crew inside Gaganyaan module has been designed. This ensures the crew is subjected to similar constraints and environment as of actual mission. Data collected during the experiment will be analysed to plan the activities for enhancing crew performance. It may further be designed to study and perform experiments for Bhartiya Antariksh Station.