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Behaviour, Performance and Psychosocial Issues in Space (1)

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ADDRESSING DISABILITY IN SPACE: ICARES-1 MARS ANALOG MISSION

**Abstract**

Analog missions are a useful tool for testing solutions for space flights and future inhabitation of extraterrestrial locations. These solutions are often developed for exceptionally fit and able people. But accidents can happen anywhere. People get older, suffer the results of microgravity, radiation, isolation. Moreover, with the time flow, colonies may show more and more independence movements. ICares-1 was the first analog mission to test procedures and equipment by the crew whose member was a person with disabilities. Our aim was not only to check all the solutions for the disabled person in the mission, but testing the Mars+10 years solutions in opposition to the thoroughly checked Mars- Day 0 missions. During the 2 weeks mission carried out in Lunares habitat in Pila, Poland, the crew tested the accessibility of the habitat and EVA procedures and equipment for people with disabilities, which included the use of a self-propelled wheelchair as a roving vehicle and a special design of the suits. They followed a targeted sports and physiotherapy protocol and 3D-printed parts of a bionic hand (Healing Space project). The crew undertook the series of biological experiments including hydroponic plant cultivation, leech and fly cultures in microgravity simulated conditions, and earthworm culture in meteorite ground (Noah's Arc project). Both projects have potential of the terrestrial spin off, and are set up as a long-term self-sustainable programs for the Mars and Lunar missions. During the mission, social dynamics, time perception and stress levels of analog astronauts were monitored.