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ANALYSIS OF VIDEO DIARIES OF ISOLATED CREW MEMBERS DURING LONG-TERM SPACE FLIGHT SIMULATION

Abstract

One of the potential risks of long-duration spaceflight is the critical breakdown of communication within an isolated crew and with ground services. To prevent such negative changes and avoid potential emergencies, it is necessary to identify trigger situations, topics, events, and communication styles that elicit strong emotional reactions from isolated crew members. To solve this problem, as J. Stuster (2016) points out, diary analysis can be used. We have proposed a new approach to the analysis of video diaries. It allows us to assess the emotional state of isolated crew members, as well as identify significant events that affect the functioning of the group. The study involved members of two crews - participants in 4- and 8-month experiments simulating a flight to the Moon (SIRIUS-21 and SIRIUS-23). 12 people (7 women, 5 men) recorded weekly semi-structured video diaries. An expert assessment of the content of diaries allows us to highlight the main ideas, significant events and the emotional response to them. The FaceReader 8 program is used to assess the duration, frequency and intensity of the manifestation of basic emotions in the facial expressions of subjects on video. The Observer XT 14 program allows us to highlight sections of video where crew members: 1) discuss work, nutrition, sleep, hygiene, leisure activities and sports; 2) describe communication dynamics (within the crew, with the experiment conductors, family and loved ones); 3) provide positive or negative evaluations of events or phenomena. The application of this methodology during the analysis of recordings from the first month of the SIRIUS-21 experiment revealed that video diaries effectively capture significant events and life aspects that influence the emotional well-being of crew members. It was evident that the work tasks and interpersonal interactions (within and outside the crew) were the most significant aspects of an isolated small group's life. The use of this method also allowed crew members to express themselves freely and privately, contributing to the release of emotional tension. This analysis method can be used to provide high-quality psychological support to participants in space flights and autonomous crews. The research program was approved by the Commission on Biomedical Ethics of the SSC Russian Federation - Institute of Biomedical Problems of the Russian Academy of Sciences. The study was supported by the Ministry of Science and Higher Education of the Russian Federation under agreement 075-15-2022-298.