

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Behaviour, Performance and Psychosocial Issues in Space (1)

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CHANGES OF VOLUNTEERS' EMOTION AND DECISION MAKING, AND EVALUATION ON
PSYCHOLOGICAL SUPPORT EFFECT IN 180-D ISOLATED AND CONFINED EXPERIMENT

Abstract

Backgrounds: The Green Journey to Deep Space was a controlled ecology and life-support integrated experiment. On the topic of Human and Environment, this comprehensive experiment was dominated by China for the first time. With international cooperation, it was carried out in Shenzhen between 17th Jun and 14th Dec, 2016. Four volunteers were isolated in a 1049 m³ hermetic facility for 180 days. Via studying the changes of volunteer's emotion and decision making, we wanted to assess the effects of psychological supporting methods. All results would be referenced for on-orbit astronaut psychological supporting system for future long-term manned spaceflight of China space station project. Methods: One female and three male volunteers were chosen to participate in the experiment after a series of rigid medical and psychological selection. Emotion, sleepiness questionnaire and decision making ability tests were performed before and after the experiment. Within the isolation, the above tests were performed once per month. Various psychological supporting methods including Tai Chi were used during the whole experiment. According to volunteers' performance in the experiment and psychological interviews after the experiment, we evaluated the effects of each psychological supporting method and the whole supporting system. Results: (1)The negative emotion rating scores were in the normal rank; volunteer 01, 03 and 04 had low negative emotion scores near the score 6; volunteer 02 had outstanding high anxiety, depression scores than other 3 volunteers ($p < 0.01$), which gradually increased higher at the middle and latter period, and got its peak at the 120th day. (2) Compared with baseline, three male's impulse factor scores had an increasing trend and reached the top at 2.5 month ($p = 0.047$), then gradually decreased; while the impulse factor score of the female kept at a low level all the time. (3) The comprehensive psychological support methods had a meaningful effect on stabilizing volunteers' emotion, keeping their appropriate motivation, and boosting their morale. Among those methods, telephone calling and video communication with families showed the most effect, while practice of Tai Chi also had a positive effect. Conclusions: The integrated psychological supporting system helped all volunteers to accomplish 180-d isolation successfully. The absence of Three Quarter phenomenon might be due to the effective psychological support. The gender difference was found in decision-making impulsivity which was uncommonly influenced by the

isolated and confined environment. Moreover, the volunteers' social experiences made an important impact on their mental performance, which should not be neglected.