Abstract:

As space administrations begin preparations for longer term space missions, addressing the potential mental health problems that can arise in astronauts will become mission critical components for future missions. Early American mental health analysis began during NASA’s Project Mercury, astronauts with certain preferred characteristics; both physiological and psychological, would be labeled as “the right stuff.” No longer are our missions confined to short term flights in LEO, but rather ones in preparation for a trek to the red planet. This review attempts to address causes and problems associated with the mental health of astronauts, while concluding with mitigation strategies and possible avenues of future research. Problems include: interpersonal disputes among astronauts, missing family, stress, loneliness, isolation. These, among others, are problems already faced by astronauts on the ISS, only naturally there is an expectation that a future lunar or Mars mission would exacerbate these problems. It is vital that we provide our astronauts with mitigation methods such as: on staff psychologists, mixed VR/VR architecture, adjusted exercise routines, special smells. These developments, while a good step forward, and a evidence of progress since the neonatal space psychology research of the Space Race era, it is clear that astronauts need more help before a mission to the red planet is appropriate.

Introduction

Space exploration is very risky. Cosmic rays, micrometeorites, among other things, are constant dangers of human spaceflight. Nevertheless, just as relevant are the within vehicle dangers. Despite their extensive training and preparations, astronauts are still human and can fall victim to the dangers of mental health crises.

Interorganizational endeavors have presented both new opportunities and challenges to mission planners. No longer are space agencies building homogenous teams, but rather across the spectrum, different ethnic, educational, linguistic, national backgrounds. While this provides ample opportunity for joint learning and pride, cultural differences can quickly arise. Consider being an American astronaut on Mir immediately following the Soviet invasion of Afghanistan, flaring tensions could easily derail the mission, and worse bring the superpowers to a new zone of confrontation.

The invention of the semiconductor has brought a litany of new avenues of astronaut health monitoring. Previously, flight surgeons were limited to simple heart rate monitors, cumbersome ground-based machines, and surveys. Currently, mission control use miniature scanners, optical computer recognition technology (from cameras), and other technologies like speech recognition. The future of space monitoring looks to be in the field of advanced biosensors. Perhaps semiconductor companies can begin to build laboratories on a chip; providing astronauts and flight surgeons with in flight monitoring of mental health bio markers.