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Medical Care for Humans in Space (3)

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HUMAN-CENTRED DESIGN OF A MEDICAL KIT FOR USE IN AN ANALOGUE SPACE MISSION: A PILOT CASE STUDY.

Abstract

Introduction: Pharmacological Countermeasures is an essential consideration to support human health during spaceflight. Evidence from a recent space and pharmacy stakeholder exploration identified a range of advanced roles for the pharmacy profession in the space sector, one of the areas highlighted is a need for optimisation of medication management. Activities which promote safe and effective medication management includes manufacturing, storage prescribing, use and disposal inclusive of the medication kit which supplies the medication in case there is medical need. An analogue space mission simulates conditions of space in order to conduct research using comparative risks for the simulation (e.g., isolation). This study employs social sciences and qualitative research to explore the experiences and needs of medication management with regards to the medication kit in space analogue missions to transfer these learnings to space exploration. Methods: Two space analogues missions were used as pilot case studies. The prototype medication kit was developed based on the WHO Emergency, space agency list adapting to the needs of each mission. Case studies on several medical scenarios were developed with an expert panel for the analogue astronauts requiring the use of the medical kit. Pre and post qualitative, focus groups were conducted with the analogue astronauts and medical related crew. The focus groups were audio recorded, transcribed verbatim and thematically analysed integrating concepts from the Human-Centred Design cycle and context of use analysis. During the mission observational data were collected. Results Four focus groups were conducted each consisting of 2-5 participants. The medication kit were found to have pros and cons. A particular positive was the significance of training in relation to the medication kit followed with a written document available for reference in mission. Communication in mission with a health professional was crucial to verify that the right medication was being administered. Participants found that the repacking of the medication with similar looking labels difficult to quickly access the right medication recommending colour coded labels with layman terms as not all crew have a medical background. Controlled medication such as opioid related medication was recommended to follow proper recording and storage (i.e. locked compartments). Other improvements were to ensure documentation of medication stock in mission to cross check which medication was used with the medical notes. Conclusion: This pilot case study provides the first analogue stakeholder-led exploration of medication kit challenges and recommendations. Future research can build on this foundation for further systematic investigation.