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DENTAL GUIDELINES FOR ASTRONAUTS ON SHORT- AND LONG TERM MISSIONS : A SCOPIC
REVIEW

Abstract

ABSTRACT Background and aim. Space exploration presents unique challenges to human health, due to space radiation, reduced gravity, and prolonged isolation. Astronauts should be prepared to manage any type of medical and dental emergencies, or effectively communicate with the ground team to address any health issues. This scoping review aimed at mapping the evidence on oral health alterations and dental emergencies faced by astronauts during short- and long-term space missions. Methods. A comprehensive search strategy was developed and performed on major scientific databases, reference lists of relevant papers, specific textbooks and databases of Space Agencies. Inclusion criteria encompassed studies reporting aspects related to dental medicine in microgravity or outer orbital space conditions. Screening and selection involved at first titles and abstracts, and then the full-text of potentially eligible studies. Data extraction was performed using an Excel spreadsheet. Synthesis of results was done through narrative format. No risk of bias assessment or statistical analysis was conducted given the scoping nature of the review. Results. Out of 23,686 studies identified, a total of 467 were considered eligible and 91 studies were included. The latter comprised 61 reviews and 30 human-based studies. Included studies were classified into four broad topics, namely microbiology (29 articles), physiology (25 articles), space

medicine (22 articles), and space dentistry (15 articles plus data from textbook chapters and Space Agencies databases). Among the studies involving human subjects, 15 were conducted under simulated microgravity conditions, while 15 involved individuals who had spent a period of time in space. Poor evidence was found about oral health modifications and issues during spaceflight. Dental emergencies in space are rare events, but the probability increases with mission duration. Much research needs to be done in this field if we want to guarantee good oral health for our astronauts.