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Comment

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Medical ethics of spaceflight should be based on ethical theories and include the non-ethical context

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The article by Siddharth Rajput and colleagues discussing the proposal of medical ethics principles for future long-term spaceflight takes as its starting point the famous, in a sense classic for modern bioethics, proposal of four bioethical principles by Tom L. Beauchamp and James F. Childress[1]. These principles are autonomy, beneficence, nonmaleficence, and justice. The authors view medical ethics as a kind of risk-benefit analysis. The principles are meant to be a guide to help make the most beneficial decision in a given situation. Rajput and co-authors stress that space ethics "must implement an unbiased decision-making toolkit focused on the crew as a single entity." I will suggest reasons to doubt their proposal and show that extending it to future long-duration missions may have troubling ethical implications.

Medical ethics is not a risk-benefit analysis

Rajput and co-authors understand ethics in a clinical way, as a set of rules for ad hoc decisions and actions. The advantages of this ethics are obvious for everyday conduct in medical practice. However, the authors further trivialize the understanding of even clinical ethics, interpreting it as a risk-benefit analysis. Ethics is primarily concerned with values, not with the analysis of benefits and risks. Even principles and rules are a consequence of defining and identifying the values that are protected by these principles and rules. It is for this reason that ethics, as will be discussed below, must grow out of the ethical theories, which the authors fail to do, in order to define the values we value and want to defend. Both ethics and bioethics and medical ethics are about morality, and morality is about beliefs about actions, persons and character that are good or bad. Both medical ethics and bioethics are forms of applied ethics, as they deal with the application of theories, principles and concepts to specific problems[2]. However, it still has nothing to do with risk analysis and requires reference to ethical theories.

Another problem with understanding ethics as an analysis of benefits and risks is that there are ethical systems, like the concept of natural law and to some extent Kantianism, that forbid weighing benefits and risks, only prescribe respect for certain values. Besides, even adopting the paradigm of benefit-risk analysis, we still do not know what should be considered a benefit and what should be considered a risk, and why. Nor is it clear in the case of long-term space missions whether the entity with moral status, whose interests prevail, is only the astronauts, or the state that sends them, a corporation, or perhaps all of humanity, or perhaps an individual mission participant.

Space ethics should not be based on four principles

The authors base their proposal on the rather uncritical adoption for granted of the four bioethical principles proposed by Beauchamp and Childress. These principles, although popular, are often criticized for their abstract nature, narrowing a complex and nuanced moral issue to a few schemes, and failing to take into account situations that do not fit outside the abstract schemes. Critics also point out that these four rather arbitrarily proposed principles contradict each other, and principlism does not provide tools to resolve conflicting principles[3,4]. This criticism of the four-principles model, slightly modified in the next seven editions, made little difference. The biggest problem seems to be the failure to include a feminist perspective exposing structures of power, oppression and discrimination. This raises a serious methodological question about the validity of applying the contested four-principles model to future space missions. Should the concept of medical ethics, the inadequacy of which has been demonstrated on Earth, be uncritically implemented into such an unpredictable, and certainly difficult and challenging, spaceflight environment? Principlism is worth keeping in mind, but it would definitely be a mistake to build a system of space medical ethics on these few principles that have been so heavily criticized.

Consideration of medical ethics for space missions should begin with consideration of ethical theories

Rajput and co-authors do not discuss normative ethical theories such as the most popular theories of consequence-based or duty-based ethics. This is a serious methodological error for at least two reasons. First, ethics, including medical and biomedical ethics (bioethics), are concerned with morality, or our beliefs about values, actions, character. Ethical theories are concerned with justifying, explaining and ordering these elements, so they cannot be ignored. And if one tries to ignore them, one should explain why. Second, the medical ethics of long-term space missions is something that is just emerging. Thus, as something new, it is all the more in need of building on ethical theories even if they were eventually to be questioned or treated in a combined manner. In the article, we present the position that medical ethics of spaceflight cannot be built without reference to ethical theories and without their detailed analysis. As an example, consider utilitarianism. This theory considers the essence of morally good action to be the maximization of good consequences. What needs to be specified is how to understand "good" consequences, good for whom, as well as how much suffering can be allowed in pursuit of these good consequences[5].

Medical ethics for spaceflight must take into account feminist ethics and bioethics

There are several reasons why feminist ethics and bioethics cannot be ignored in planning the medical ethics of spaceflight. The first reason is that feminism is the only ethical theory that focuses on finding and combating inequality and exclusion. Second, feminism specifically raises questions about the meaningfulness of space missions. If space missions will be difficult and dangerous and require sacrifice, it is worth considering the rationale for such missions, especially if it is nationalistic and militaristic. Third, as J.S. Johnson-Schwartz notes, the ethics of space missions must be demanding, even more demanding than the ethics of extreme environments on Earth, and the decades-long record of the humanities exposing mechanisms of exclusion and oppression can no longer be trivialized[6]. This

requirement is particularly strong with regard to space exploration, where, at least ostensibly, we have a chance to build something from scratch without duplicating mistakes from history on Earth. The feminist bioethics of space exploration makes us particularly sensitive to traditionally marginalized people, such as those with disabilities or those excluded on the basis of gender[7]. It is unclear how the very general outline of the four principles discussed by the authors, looking at "crew as a single entity," will help to treat people with disabilities equally in space.

Conclusions

The medical ethics of future long-term spaceflight should take into account a broad, non-medical context. This context includes both the mechanisms of exclusion, inequality and discrimination, as well as the justification for space missions. Normative ethical systems should be the starting point. The four principles are unable to function as a satisfactory basis for ethical decisions in the unfamiliar, challenging and dangerous environment of space missions.

Data availability

No datasets were generated or analyzed during the current study.

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Competing interests

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Additional information

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