



# International Journal of Home Science

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**Anshu Sharma**  
Student, School of Design and  
Arts, at Poornima University,  
Jaipur Rajasthan, India

**Dr. Ankita Singh Rao**  
Assistant Professor, School of  
Design and Arts, Poornima  
University, Jaipur, Rajasthan,  
India

## A study based on how female astronauts deal with menstrual cycle and maintain health during space travel

**Anshu Sharma and Dr. Ankita Singh Rao**

### Abstract

Spaceflight is flight into or through outer space and it aids in resolving basic questions about the Universe and this process is executed by astronauts. They face numerous physical risks while being in space and it's especially more difficult for female astronauts. Females experience menstrual cycle every month but as human body undergoes a lot of changes during space travel so does this affect the regular bleeding like on Earth? Would the blood get collected back into the uterus under microgravity? How does females tackle these situations, maintain their health and bear all the repercussions this paper casts light on such issues.

**Keywords:** Menstrual cycle, space travel, female astronauts, LARC, COC, health, menstrual suppression.

### Introduction

#### Background Study

Space is such a fascination in itself. It's a vast universe full of curiosity and endless opportunities for the growth of mankind. Just like the galaxies we are stardust too and it seems that everything is connected. Space, life and humans there is a connection between them, a link. Who knew that one day humans could walk on The Moon? So how does life sustains itself in the dark ocean of wonder and accomplish its goals.

### Introduction

Space is the limitless, incalculable three dimensional expanse in which entities and occurrences have relative position and direction. "Humans began the physical exploration of space during the 20th century with the advent of high altitude balloon flights." [1] [Outer Space] Astronauts are space travellers who are trained for spaceflights, they conduct experiments, research in space, collect information and deploy satellites. Becoming an astronaut is a highly honourable achievement and it comes with great responsibilities and difficulties. Taking female astronauts under consideration, they go through menstruation every month and this adds to their problems. Menstruation is the regular vaginal bleeding that occurs from the lining of the uterus. The menstrual fluid consists of some blood, mucosal tissue and partly tissues from inside of the uterus. And it's so surprising that this mechanism does not change under the extremities of space while there are many normal body functions which show alterations due to change of conditions. Female astronauts can have normal periods in space. The menstrual fluid flow is not affected by the zero gravity they encounter and it does not get collected in the uterus. There are methods to control the monthly cycle therefore having periods or not is a personal choice, if they wish to avoid periods in space they can opt for menstrual suppression. Escaping periods is a better option for long-term missions.

### Menstrual Suppression

Menstrual suppression means the implementation of hormonal management to cease or decrease menstrual bleeding. Astronauts who wish to have periods in space can take the necessary precautions, guidelines and menstrual management products along with them. But still they would face challenges concerning hygiene, disposal of tampons, and even the water

**Corresponding Author:**  
**Anshu Sharma**  
Student, School of Design and  
Arts, at Poornima University,  
Jaipur Rajasthan, India

available for cleaning purpose is limited as water is retained from urine and this process is not suitable for menstrual blood. Therefore, menstrual suppression seems a better option.

### Combined Oral Contraceptives

Combined oral contraceptives (COC), or the pill, which prevents ovulation, if taken continuously for three weeks in a row without taking a week off seems the most secured, ideal choice and it is not related to any harmful side effects. It consists of two hormones: estrogen and progesterone, here estrogen is the main factor controlling the cycle.

### Long-Acting Reversible Contraceptive

Long-acting reversible contraceptives (LARC) are the ways of fertility control, which provides efficient contraception for longer period of time.

“LARC methods include IUDs and the subdermal implant

- Hormonal intrauterine device. (IUC or IUS)
- Nonhormonal intrauterine device with copper. (IUD)
- Subdermal contraceptive implant” [2] [Methods]

Among all the reversible methods LARCs are the most efficient and convenient. “LARC methods require little to no user action after insertion.” [3] [Medical Use]

### Review Studies

Jain Varsha 2016, expressed her views on menstrual health in Space. It's absolutely safe to have menstrual suppression because there are long chronological records in support of COC to be used during space missions. It is a cautious and dependable method of contraception. Even LARCs are also a really good option. They work for longer period of time which makes them more suitable for long manned missions. The implants introduced in the body provides excellent contraception rates. Implants with the further use of COCs have been reported successful.

Paria Baishakhi, Bhattacharyya Agnihotri and Das Sukesh 2014, they conducted a comparative study on menstrual hygiene among urban and rural adolescent girls of West Bengal. Menstruation is a physiological process but it is often considered unclean and unhygienic in the society. Menstrual Hygiene practices were disappointing in the rural area as compared to the urban area. Educating girls properly about hygienic practices and setting them free from traditional beliefs, myths, and limitations of menstruation should be the aim for better future in female health department.

Allshouse Amanda, Pavlovic Jelena and Santoro Nanette 2019, they expressed their views on menstrual cycle hormone

changes associated with reproductive aging and how they may relate to symptoms. Study shows that both headache and sleep differ in relation to certain hormone patterns. “Overall, hormonal instability appears to be associated with worse symptoms, but more research is needed. A better understanding of how hormone patterns may cause symptoms in midlife women will inform appropriate approaches to treatment.” [4] [Conclusion]

### Countermeasures for Health Maintenance

Astronauts go on long duration space missions which means that they have to live in space for more period of time. For every second spent in space they pay the price, their body go through lots of changes and they have to adapt and even support their bodies for proper functioning, completion of the mission and their safe return back to the Earth.

A crucial health risk factor for astronauts is the exposure to high energy UV radiations which can cause impairment to tissue, cell and even DNA. They wear specially designed and shielded spacesuits for protection from the hazardous radiations. In space Astronauts are under the influence of microgravity and therefore their bones gets weak. Therefore, they have to exercise for almost 2 hours a day so that their muscles stays strong and they do not face problems like imbalance, altered vision, strength issues and blood pressure on returning to Earth. Still, they suffer a bone mass reduction of 1 to 2% each month. This condition is called spaceflight osteopenia. And under weightlessness every fluid floats upward into their face and head, giving rise to puffy face syndrome. Slower wound healing and immune system also weakens.

So to fight all this and to stay healthy, astronauts require to eat properly, get enough sleep of 8 hours, and exercise regularly.

### Keynote

1. **Microgravity:** It is the condition of zero gravity and the objects and human experience weightlessness.
2. **Galaxy:** It is a combination of stars, along with dust and gas millions and billions in number and bonded by gravitational force. It contains the solar system.
3. **Subdermal Implant:** They require the placement of a steroid progestin from rods is kept under the skin a woman's skin. Provides 1-5 years effectiveness.
4. **Syndrome:** Collection of symptoms and signs referring to a particular medical condition.
5. **Osteopenia:** A bone loss condition in which bones deteriorate faster than formed.



Image Source: nasa.gov



Image Source: spaceflight.nasa.gov

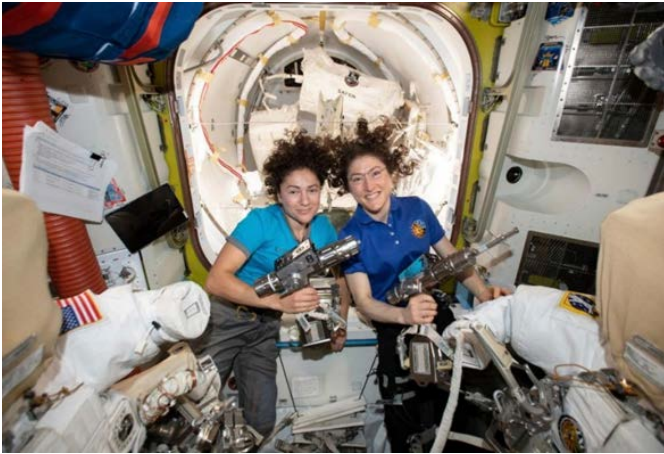


Image Source: Article – NASA astronauts make history with first all-female spacewalk

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