

Health and stress

(week 3)

The role of stress in cancer I

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outlines

- Stress
- Can stress cause cancer
- Physiological source of stress
- Different types of stress
- Contribution of chronic stress
- Popular theories about stress and cancer (research data)

Objectives

- Define the word stress
- Evaluation of the question if stress can cause cancer or not?
- Comparison of the different physiologic sources of stress.
- Analyze the types of stress and their impacts.
- Analysis of the theories about research data.

- Stress is part of your body's normal reaction to a perceived threat.
- It isn't necessarily a bad thing.
- It can drive you to accomplishing things and help you avoid potentially dangerous situations.

- But too much stress can have a big impact on your physical and emotional health, leading some experts to take a look at the possible role of stress in the development of cancer.
- ***Can stress cause cancer?***
- the link between cancer and stress, the existing evidence, and how stress might affect existing cancer are not clear.

Physiological sources of stress

- When your brain recognizes something as a possible threat or danger, a combination of **nerve and hormone signals** are sent to your adrenal glands.
- In turn, these glands produce hormones, including **adrenaline*** and **cortisol**, that kickstart the stress response.

*Adrenaline (epinephrine) is a hormone and medication which is involved in regulating visceral functions (e.g., respiration).

Different types of stress :

Acute stress

- Acute stress is what most people imagine when they talk about stress. It's typically short-lived and triggered by specific situations. E.g
- having an argument with a family member or friend
- feeling pressure to meet an important deadline
- Acute stress can cause several physical symptoms, including:
- rapid heart rate
- increased blood pressure
- quick breathing
- muscle tension
- increased sweating
- These effects are usually temporary and resolve once the stressful situation is over.

Chronic stress

- Chronic stress happens when your stress response is activated for **prolonged periods of time**.
- It can wear you down both **physically and emotionally**
- **Working a job that you hate**
- **Living with a chronic illness**
- Compared to acute stress, chronic stress can have long-term effects on your physical and emotional health.

Chronic stress can contribute to:

- **Over time:**
- heart disease
- digestive issues
- anxiety and depression
- weight gain
- problems sleeping
- difficulties concentrating or remembering things
- fertility problems
- **weakened immune system**

Popular theories about stress and cancer

- There are a lot of theories about how stress could possibly contribute to a person's risk of developing cancer.
 1. Continuous activation of the stress response and exposure to the associated hormones could **promote the growth and spread of tumors**.
 2. **The immune system** can be important for finding and eliminating cancer cells. But chronic stress can make it harder for your immune system to carry out these tasks.
 3. Prolonged stress could lead to a state of **inflammation** that may contribute to cancer risk.
 4. Stress can prompt people to turn to unhealthy coping mechanisms, such as **smoking, drinking excessive amounts of alcohol, or overeating**.
All of these can increase your risk of developing cancer.

References

- Kruk, J., 2019, **Psychological Stress and Cellular Aging in Cancer: A Meta-Analysis**, *Oxid Med Cell Longev*13:2019:1270397.
- Gaillard, H., 2015, **Replication stress and cancer**, *Nature review cancer*, 15(5):276-89.