

Physical activity, meditation and mental health – Evidence from biomarkers

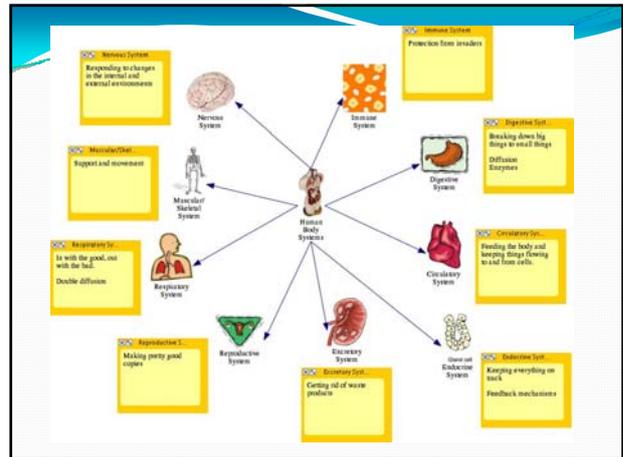
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• “Health is affected greatly by lifestyle and behavior patterns, especially those related to **stress**”.

Coon and Mitterer
«Introduction to psychology: gateways to mind and behavior»

What is stress?

- Stress is the mental and physical condition that occurs when we adjust or adapt to the environment.
- Objective (Event/environment-based) stress
- Subjective (perception-based) stress
- Stress is a natural part of life
- Links between chronic stress and poor health



Stress and biomarkers

- Focus on
 - Nervous system
 - Immune system
 - Endocrine system
- Biomarkers:
 - Cortisol (stress hormone)
 - Insulin
 - Oxidative stress
 - Telomere/telomerase

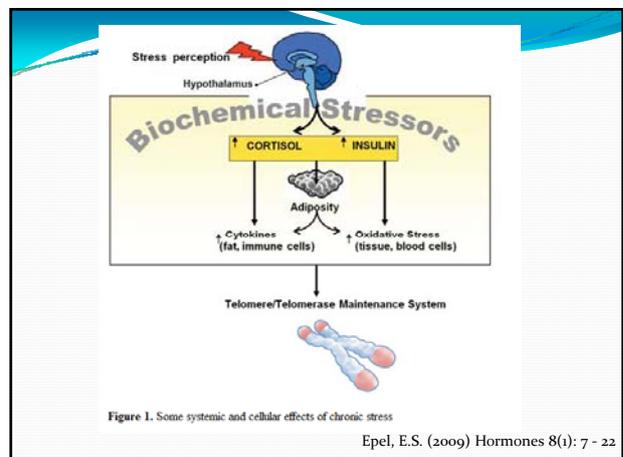
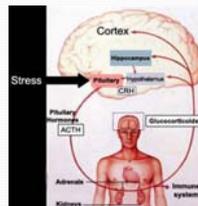


Figure 1. Some systemic and cellular effects of chronic stress

Epel, E.S. (2009) Hormones 8(1): 7 - 22

What is telomere?

- Psychobiomarker
 - Measure psychosocial stress and well being
 - Precede and predict early disease and mortality
- Telomeres are DNA-protein complexes that cap chromosomal ends.
- Promote chromosomal stability




Age, stress and TL

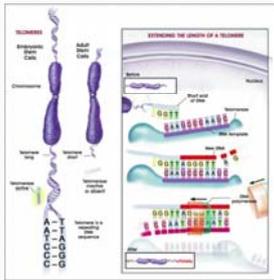
- Chronological age is the predictor of disease and death
- Cells divide, telomere can shorten and cause cell senescence
- Telomere length (TL) is a biomarker of a cell's biological "age"
- Telomere length ↓
 - ↓
 - Cell aging

•Life stress affects the rate of telomere shortening
Epel, E., et al (2004) PNAS 101: 17312 - 17315



Telomerase

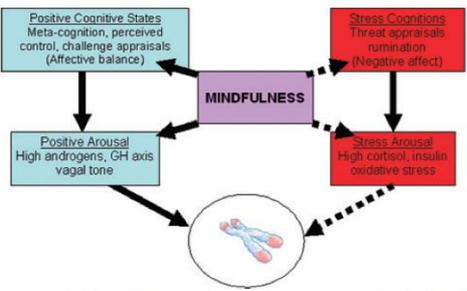
- A cellular enzyme
- Has telomere-protective function and rebuilt telomere
- Telomerase activity ↓
 - ↓
 - Cell aging



Physical activity, meditation and mental health

- Mindful meditation and exercise have positive effects for depressive disorders
- Exercise and Yoga have positive effects for anxiety disorders
 - Saeed S.A. (2010) 81(8): 981 – 986
- Lower levels of physical activity in childhood associated with adult depression.
 - Jacka, F. N., et al (2011).
- Exercise can buffer stress effects' on TL

Meditation can slow rate of cellular aging



Epel E. (2009) Annals of the New York Academy of Science. 1172: 34 - 53

Qigong

- Qigong is an ancient art of self-healing exercise
 - mind regulation
 - body regulation
 - breath regulation
- Qigong focuses on the balance between yin and yang, as well as smoothing the circulation of qi (vital energy) inside the body

