

# Health and stress

(week 5)

## Depression and Health I

Lecturer

Medical Microbiologist

Erbil Medical Institute

Erbil Polytechnic University

Kirkuk Road

Erbil-Iraq

Lecturer

TISHK Int.University

100 Meters Road

Erbil-Iraq

GBD Collaborator

Institute of Health Metrics and Evaluation

University of Washington

Seattle, Washington

USA

**Dr. Beriwan A. Ali**

PhD. Manchester University, England, UK.

MSc. Salahaddin University, Erbil, Iraq.

BSc. Salahaddin University, Erbil, Iraq.

# Outlines and Objectives

## Outlines:

- Introduction
- Global burden of depression
- Mechanism for developing heart disease in depressed patients
- Risk factors for depression
- Major components of Lifestyle Medicine
- Environmental stressors
- Genetic facts
- Summary

## Objectives:

- Evaluate the burden of depression.
- Characterize the mechanism for developing heart disease in depressed patients.
- Determine the risk factors for depression
- Compare the components of Lifestyle Medicine.
- Analyze the environmental stressor and genetic facts for depression.

# Introduction

- Depression is the most common psychiatric disorder in the world population and the most frequent mental disorder in a primary health care.
- Unrecognized and untreated depression is associated with **a poor outcome of treated chronic diseases** which co-exist with depression.
- Depression and cardiovascular diseases **are bidirectional related conditions**, risks are for each other, and they often co-exist.

# Global burden of depression

- Depression is a common disorder in cardiovascular patients with a prevalence of 20% to 45%, which is much more frequent than in the general population.
- In cardiac **patients with acute myocardial infarction**, depression occurs **three times** more often than in the general population.
- Depression has a direct effect on the pathophysiological changes of various organ systems, changing the values of **blood pressure, heart rate, vasomotor tone, vascular resistance, blood viscosity and plasma volume**.

The potential mechanism for developing heart disease in depressed patients includes:

- hypothalamic-pituitary-adrenal gland dysfunction,
- increased proinflammatory and prothrombotic factor activity, reduced omega-3 fatty acids,
- reduced heart rate variability,
- **smoking,**
- physical inactivity,
- reduced mood,
- **self-esteem and self-efficacy.**

# Other factors

- While many factors, including genetics, personality and cognition, and environmental stressors contribute to **the etiology of depression**, but **lifestyle components** may have an important role in the disorder's pathogenesis.

# Risk factors for depression:

- dysfunctional cognitions,
- stressful life events and circumstances,
- parental depression,
- interpersonal dysfunction,
- being female,
- environmental issues (e.g. urbanisation, and exposure to air, water, noise, and chemical pollution), and the increasing human interface with technology.

# Major components of Lifestyle Medicine

- physical activity or exercise,
- dietary modification,
- adequate relaxation/sleep and social interaction, use of meditation techniques, and the reduction of recreational substances such as **nicotine, drugs, and alcohol.**



# Environmental stressors,

- such as:
- **Childhood maltreatment**, have been recognized to contribute to the development of depression.
- Growing evidence suggests that **epigenetic changes are a key mechanism by which stressors interact with the genome** leading to stable changes in DNA structure, gene expression, and behaviour.

# Genetic facts

**Stress-associated epigenetic changes in the following genes were correlated with depression:**

NRC31, SLCA4, BDNF, FKBP5, SKA2, OXTR, LINGO3, POU3F1 and ITGB1.

Epigenetic changes in glucocorticoid signaling (e.g., **NR3C1, FKBP5**), serotonergic signaling (e.g. **SLC6A4**), and neurotrophin (e.g., **BDNF**) genes **appear to be the most promising therapeutic targets for future research.**

However, continued research is warranted due to inconsistent findings regarding the directionality of epigenetic modification.

**\* Future studies should** also aim to control for the use of **psychotropic agents** due to their widespread use in depressed populations and established effects on DNA methylation.

# Summary

- data supports that some of these individual elements are modifiers of overall mental health, and in many cases **depression**,
- research needs to **address the long-term application of Lifestyle Medicine for depression prevention and management.**
- **Lifestyle modification** should be a routine part of treatment and preventative efforts.

# Reference:

- Sarris J., et al., 2014, **Lifestyle medicine for depression, BMC Psychiatry, 10:14:107.**
- Wing R. R., *et al.*, 2002, The role of adherence in mediating the relationship between depression and health outcomes, Journal of Psychosomatic Research, Volume 53, Issue 4: Pages 877-881.