

«Physical Activity and Mental Health»

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INTRODUCTION

The purpose of the presentation is to discuss:

- **The types of Mental Disorders**
- **The prevalence of Mental Disorders**
- **Ways of enhancing Mental Health**
- **The effects of Physical Activity on Mental Disorders**





MENTAL HEALTH (MH)

Definition:

According to WHO, is not only the absence of a mental disorder, but it describes the state of well-being in which the individual:

➤ He/she understands and exploits his/her abilities

➤ He/she is able to handle everyday stress

➤ He/she is able to work productively

➤ He/she contributes to his/her community





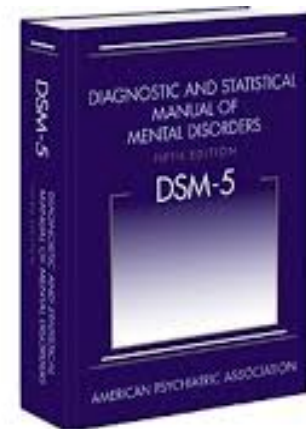
MENTAL DISORDERS (MD)

Widely established systems for classifying mental disorders:

- The **DSM-5** produced by the A.P.A.
- The **ICD-10** produced by the W.H.O.

According to **DSM-5** (Diagnostic and Statistical Manual of Mental Health) the main types of MD are:

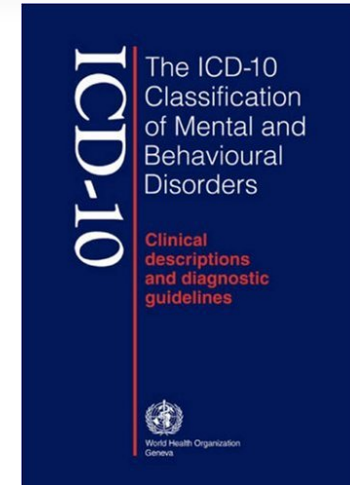
- **Neurodevelopmental disorders** (Intellectual disability, autism spectrum disorder etc.)
- **Schizophrenia spectrum and other psychotic disorders**
- **Bipolar disorder**
- **Depressive disorders**





MENTAL DISORDERS

- **Obsessive-compulsive and related disorders**
- **Anxiety disorders** (phobias, panic attacks, generalized anxiety disorders)
- **Personality Disorders**
- **Eating disorders**
- **Substance-Related and Addictive Disorders**
- **Manias** (pyromania, kleptomania etc)



- **Dementia**
- **Alzheimer's Disease**



Organic mental disorders

ICD-10 (International Statistical Classification of Diseases and Related Health Problems) by WHO

Increasing interest in mental health because:

- It helps to improve the quality of life of the individual (physical and mental health are key ingredients)
- Around 450 million people worldwide suffer from such conditions
- Almost 800.000 people die due to suicide every year (the second leading cause of death among 15-29 year olds globally)
- MD are important risk factors for the development of other diseases (cardiovascular diseases, diabetes, HIV)



1 in 4 people in the world will be affected by mental or neurological disorders at some point in their lives

27% of the adult European population was affected by at least one MD in the past 12 months

MD are more prevalent among women, young people and the elderly

Globally, more than 300 million people are now living with depression, an increase of more than 18% between 2005 and 2015

Depression and anxiety disorders cost the global economy **\$1 trillion** annually

Lost productivity because of apathy or lack of action

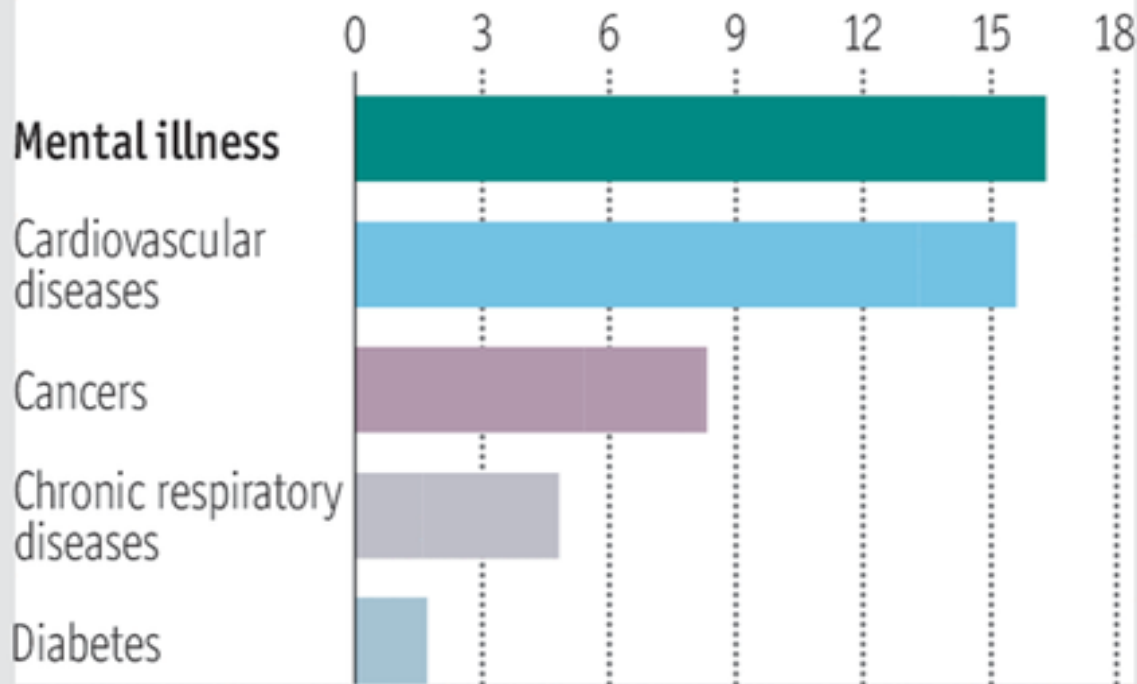




Financial losses

Forecast loss of output caused by non-communicable diseases worldwide, 2011-30

\$trn (2010 \$)



Harvard School of Public Health and the World Economic Forum

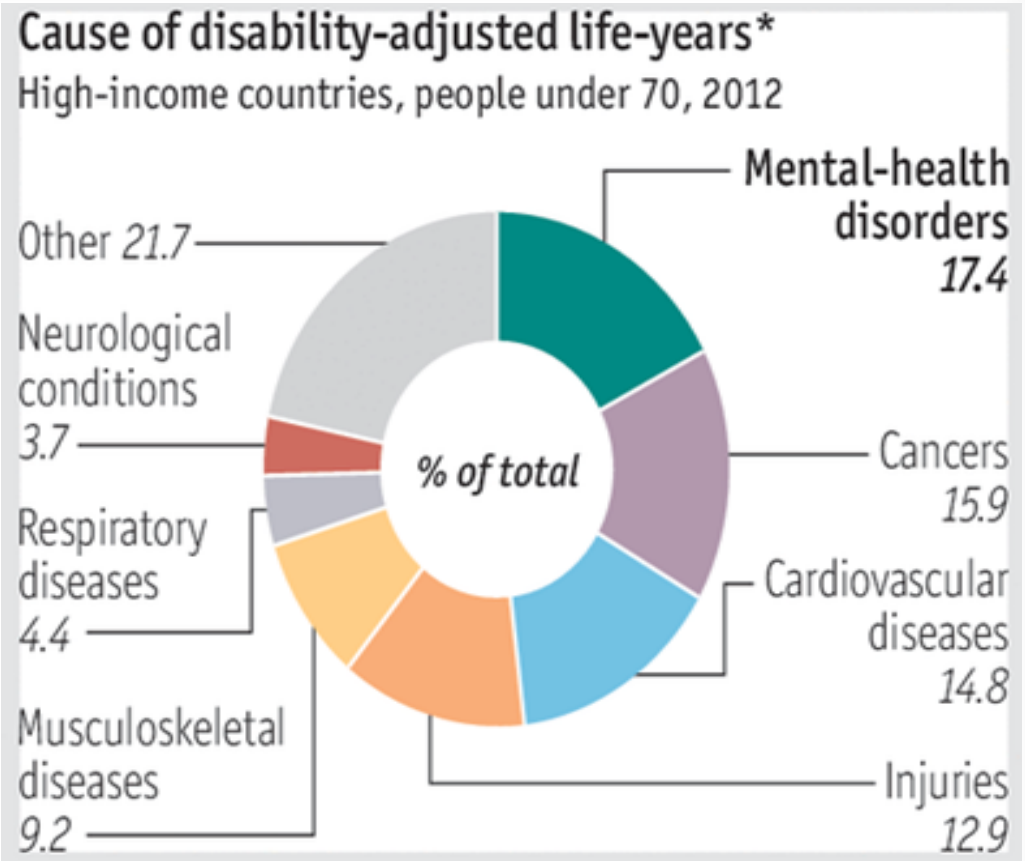


Cause of disability

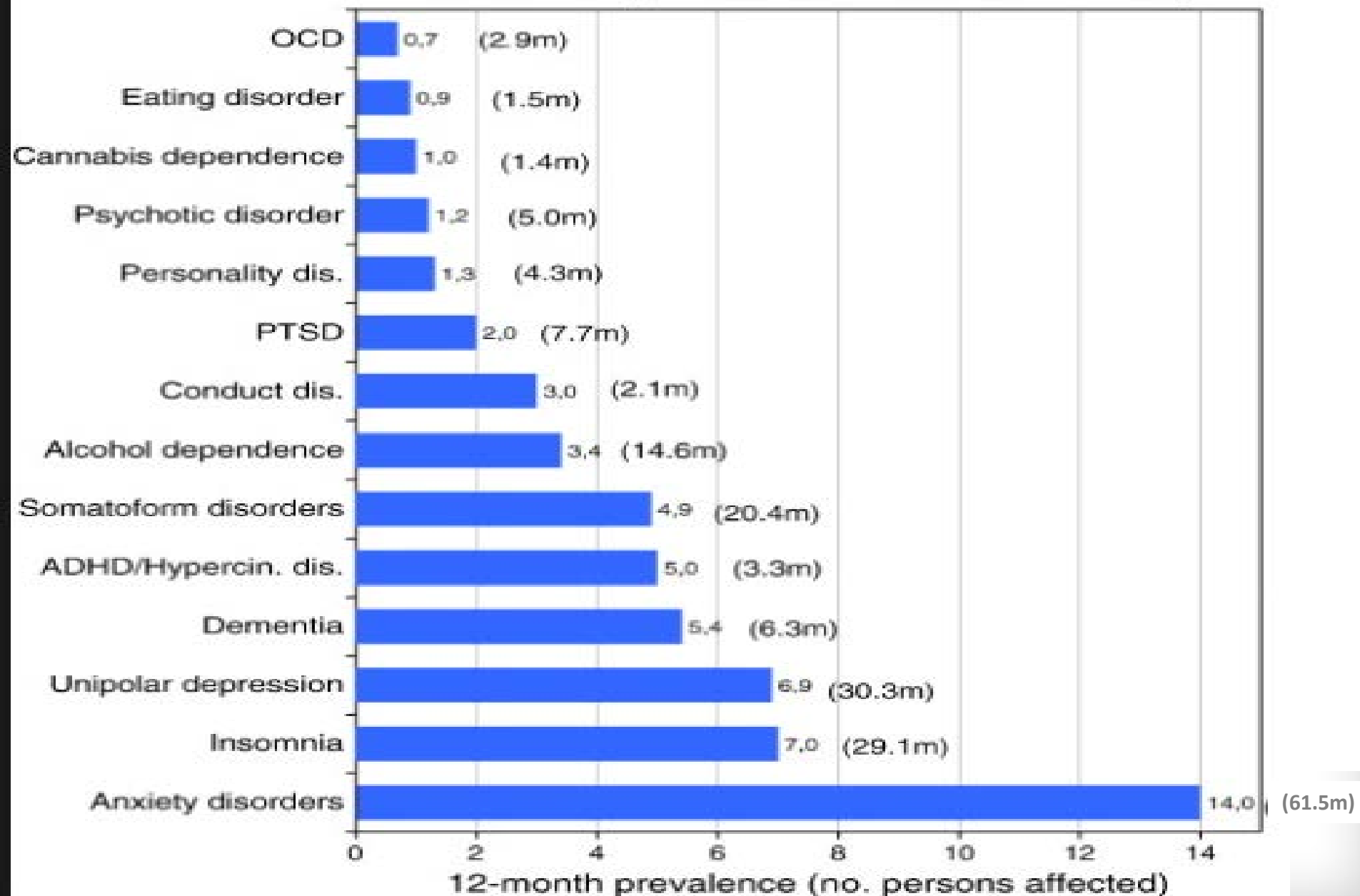
Mental Disorders



Leading causes of years of life with disabilities (YLDs)



Mental Disorders by prevalence (and estimated number of persons affected in millions)





Prevalence of depression and anxiety

In Europe every year...



About 1 out of 15 people suffer from major depression

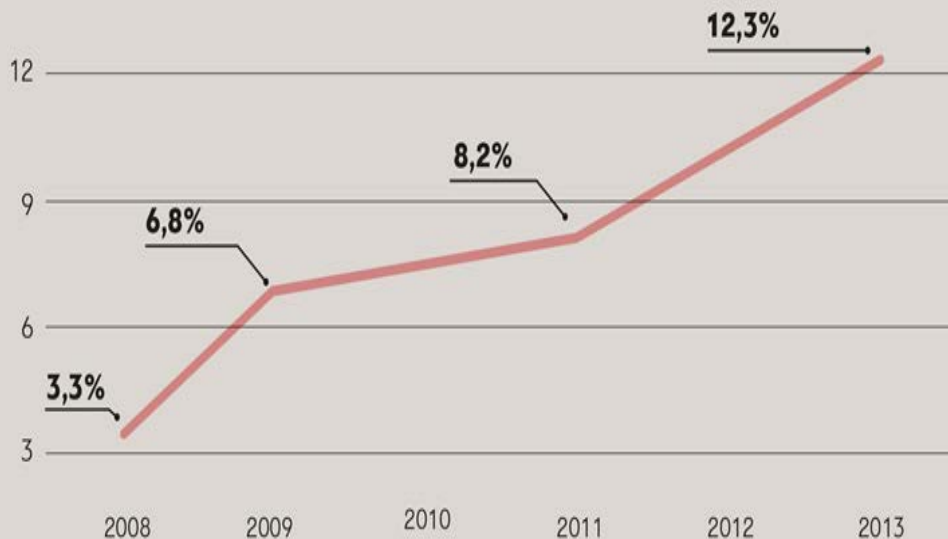
If anxiety and all forms of depression are included, nearly 4 out of 15 people are affected





Depression in Greece

ΠΟΣΟΣΤΟ ΠΛΗΘΥΣΜΟΥ ΜΕ ΜΕΙΖΟΝΑ ΚΑΤΑΘΛΙΨΗ



Πηγή: διαΝΕΟσις/ΕΠΙΨΥ

High-risk groups:

- Elderly
- Women
- Widows-ers, divorced
- People of low socioeconomic status and low level of education
- Unemployed

**Financial
disability**

Major Depression



The W.H.O. warns...

World Health Organization

Its action plan for 2013-2020 (in cooperation with its Member States and other organizations) aims :

- To strengthen effective leadership and governance for mental health
- To provide comprehensive, integrated and responsive mental health and social care services in community-based settings
- To implement strategies for promotion and prevention in mental health (the rate of suicide in countries will be reduced by 10% -by the year 2020)
- To strengthen information systems, evidence and research for mental health



Physical Activity (PA)- Mental Health (MH)

- ❖ Does Physical Activity contribute and how?
- ❖ Can we talk about treatment or prevention without a healthy and functional body?
- ❖ What is the relationship between Physical Activity and Mental Health?





What is Physical Activity (PA)?

“Any bodily movement produced by skeletal muscles that requires energy expenditure”

PA > Exercise

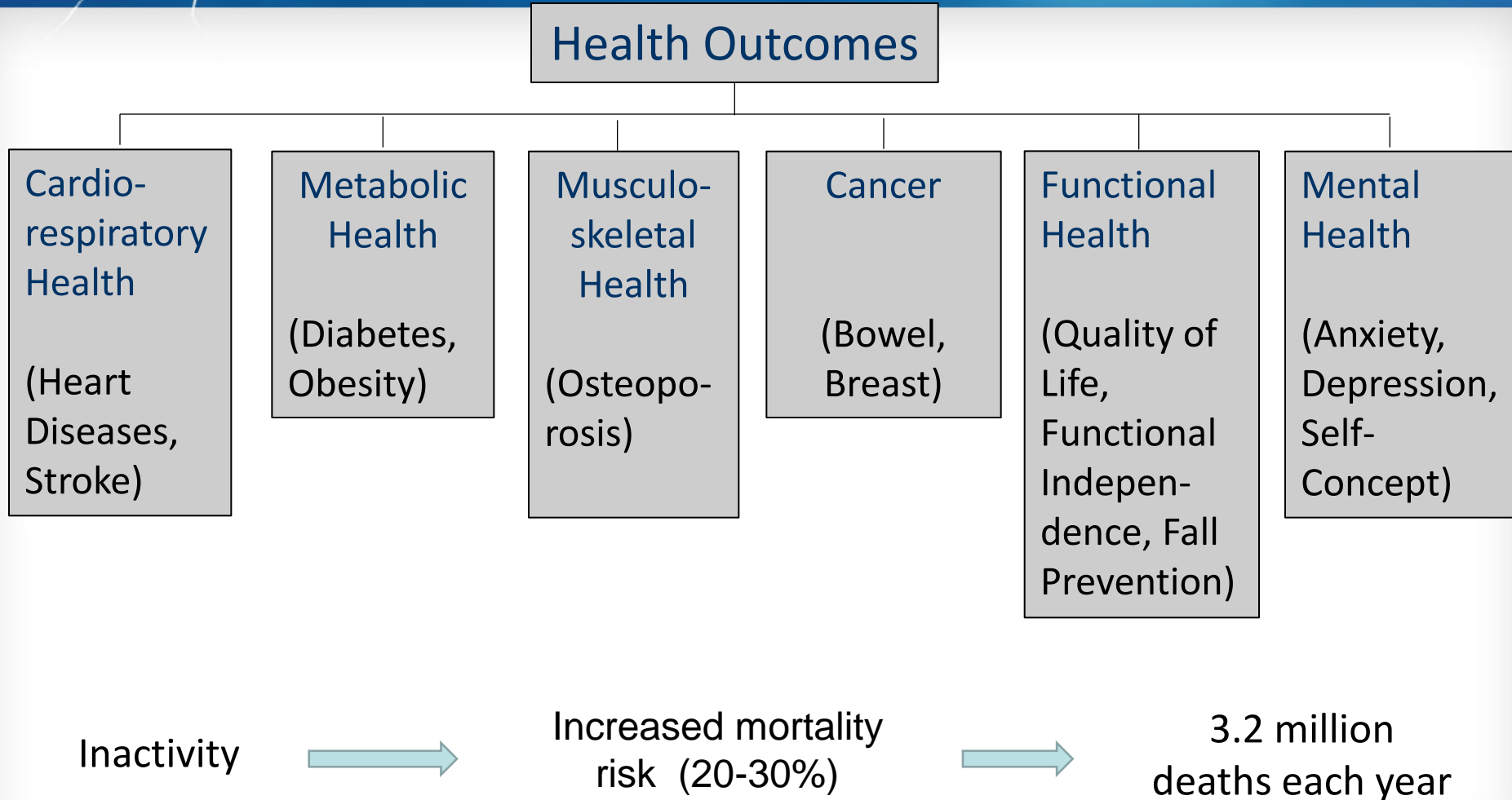


- Planned
- Structured
- Repetitive
- Purposeful



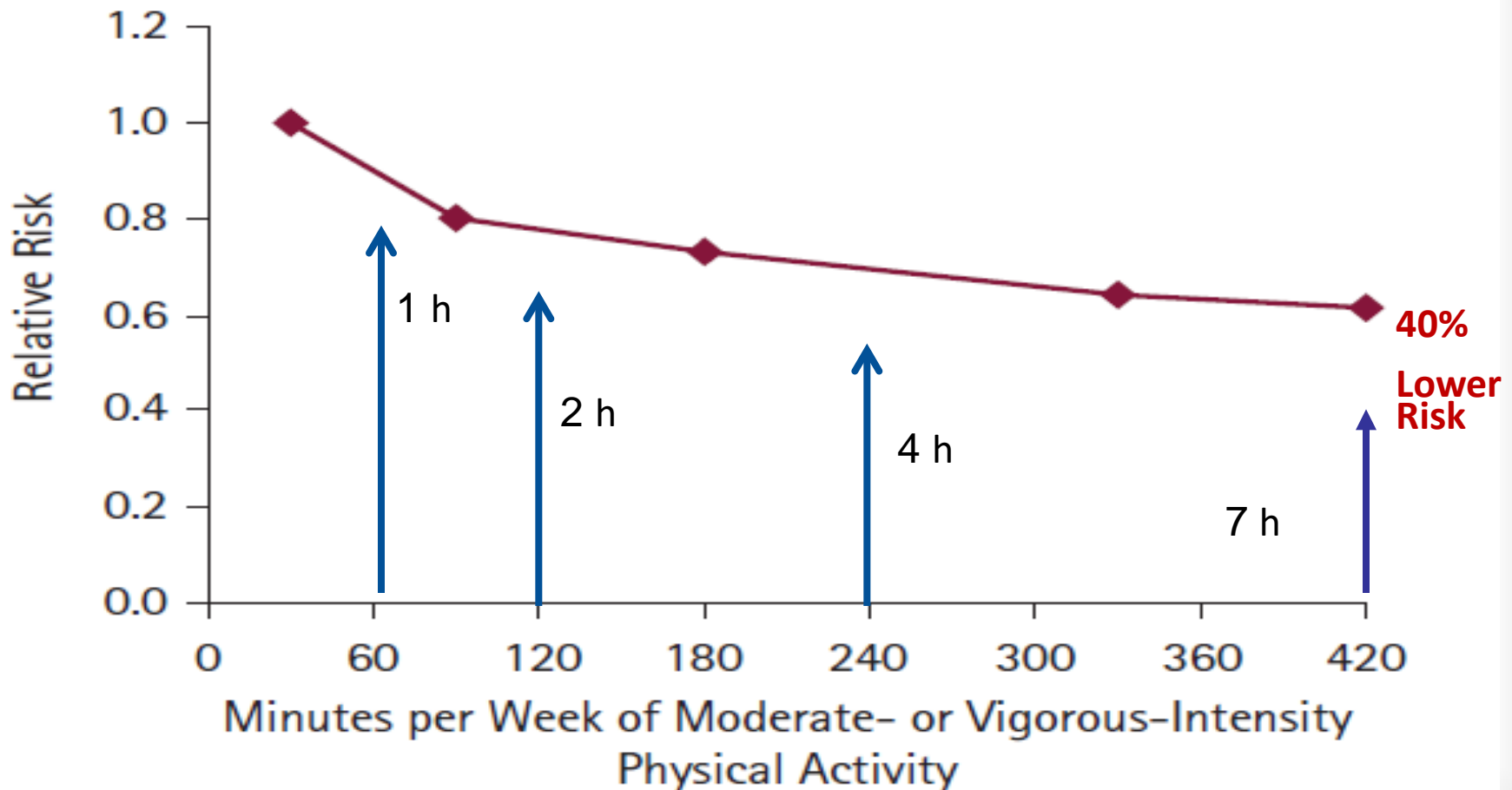


PA and Health



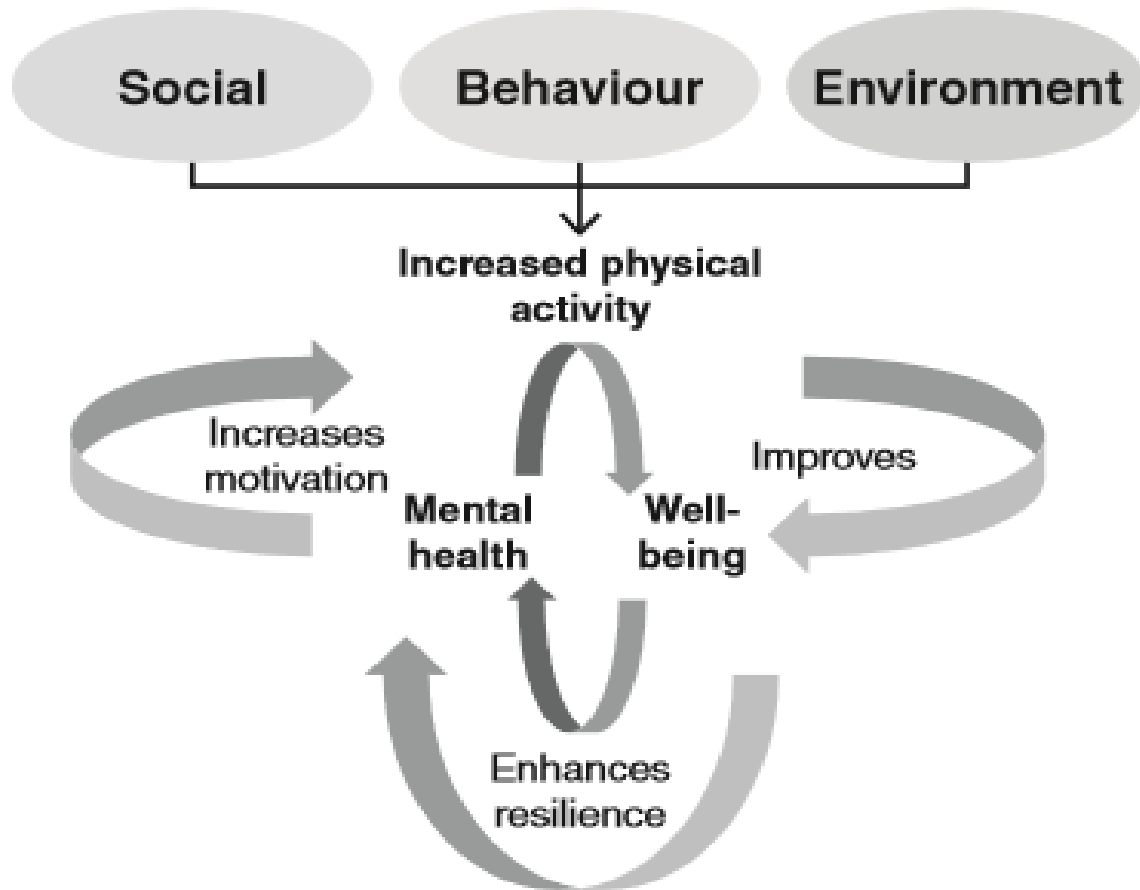
The risk of premature death decreases with increasing participation in Physical Activities

Become Physically Active





Some of the complex systems involved in linking PA with well-being and MH



- It can be difficult to determine the precise “active ingredient” that confers benefits
- PA is often associated with other potentially beneficial elements (social interaction, fresh air, exposure to green spaces etc)

PA sets in motion a sustainable cycle of enhanced psychological resources



Domain-Specific PA and Mental Health

- A meta-analysis of 98 studies has shown that the relationship between PA and MH varies among different PA domains.
- Although lifestyle PA **outside leisure time** may improve people's physical health, such behaviors may not benefit MH.

A number of psychosocial mechanisms explain the effect of PA on MH

PA during leisure time

Enhances self-efficacy and exposes individuals to challenges that offer opportunities to develop confidence and a sense of mastery

Social interaction

Autonomous motivation

Distraction from stressful life events



Anxiety Disorders - Depression and PA

The most common mental disorders

Mood disorders are a common problem and their symptoms are a serious public health issue

The first attempts to understand the connection between PA and MH:

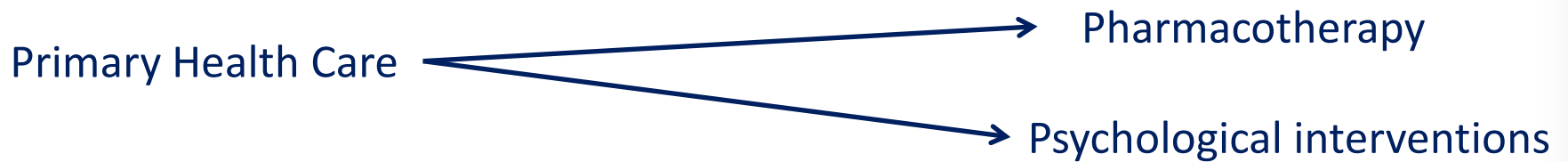
- An epidem. study (Farmer et al., 1988) involving 1,900 participants aged 25-77 years showed:
- A survey of 1536 people over 15 years old (Meyer, 1992) revealed that :



Physical inactivity may be a risk factor for depressive symptoms.



Treatment



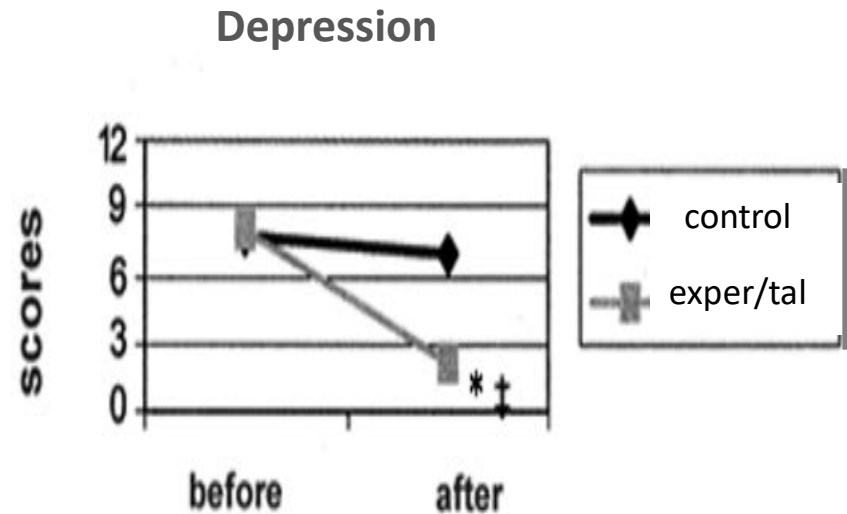
- The role of exercise as an adjunct to conventional therapies is gaining momentum
- A large number of recent studies demonstrate exercise to be effective in reducing depression symptoms
- Indeed, a number of previous studies have found exercise to be as effective as medication or psychological interventions



Results of studies

A study in the elderly (60-75 years old) showed that participation in aerobics programs (3 times per week for 6 months):

✓Reduces levels of depression



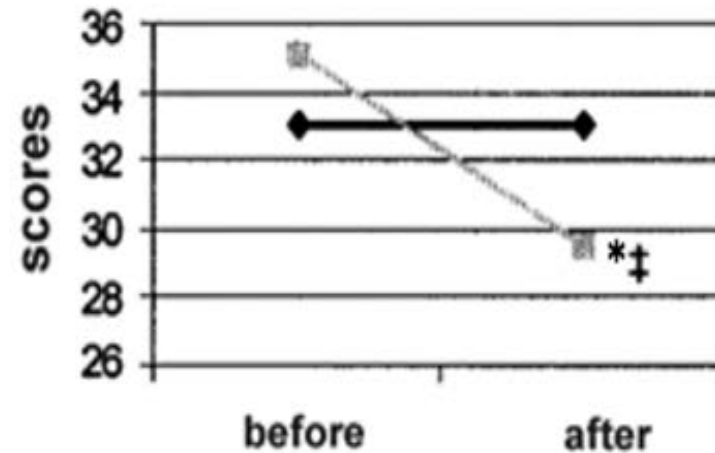


Results of studies

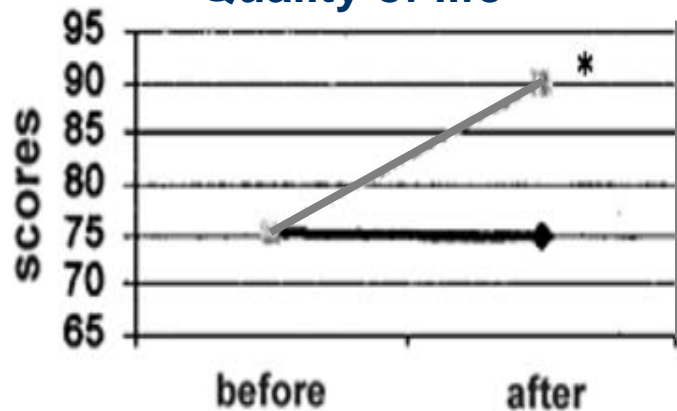
✓ Reduces levels of anxiety



Anxiety



Quality of life

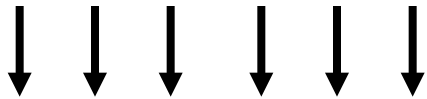


✓ Improves quality of life



A meta-analyses of experimental studies

- Positive effects of exercise, in healthy people and in clinical populations regardless of gender and age
- The benefits are significant, especially in subjects with an elevated level of anxiety and depression
- More affective results



Rhythmic, aerobic exercises, using large muscle groups (jogging, swimming, cycling, walking) of moderate and low intensity

Duration: 15-30min

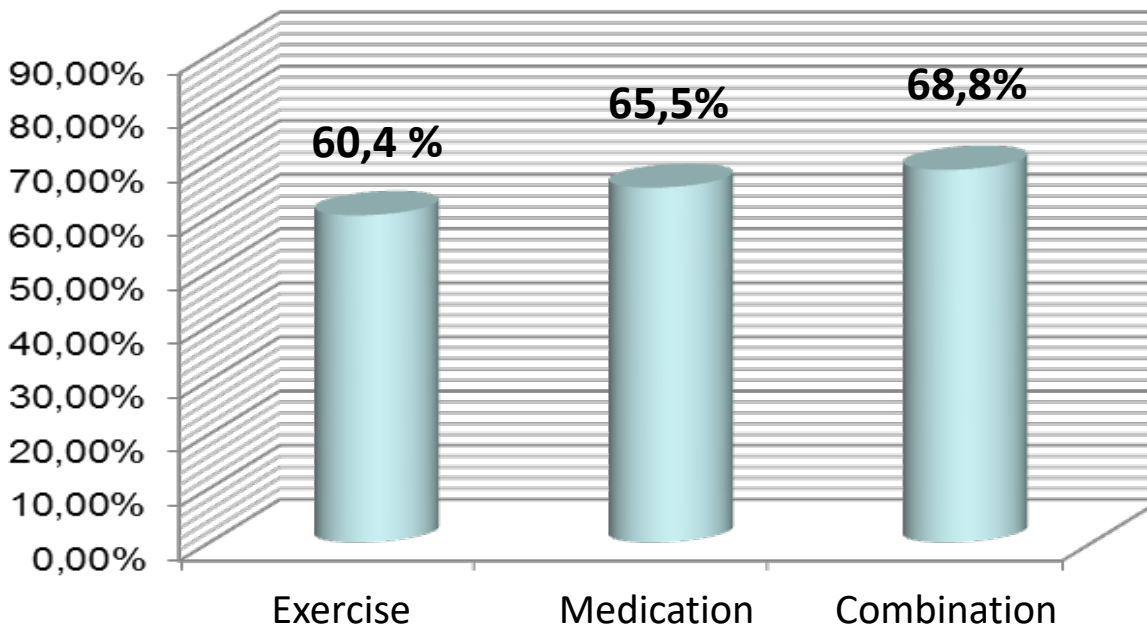
Frequency: a minimum of 3 times/week in programs of 10 weeks





Physical exercise, medication or combination?

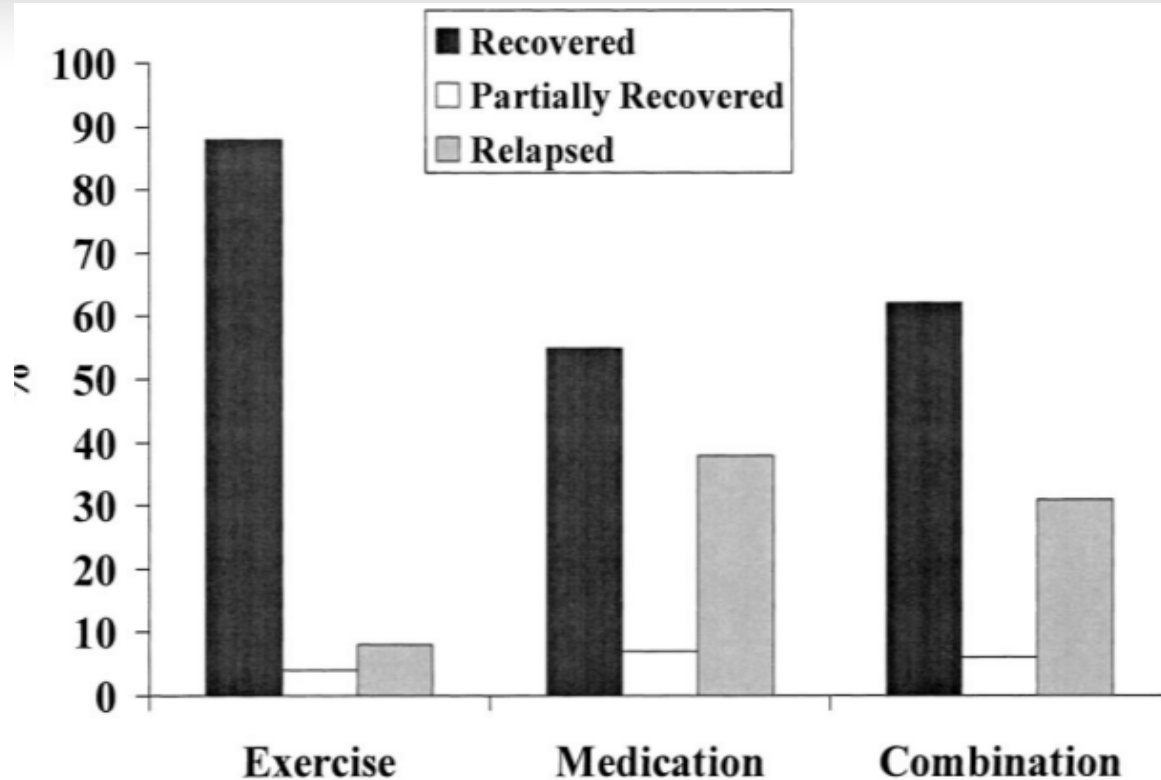
A study of 3 experimental groups with major depression disorder (exercise, medication and combined exercise and medication) after 4 months showed similar rates of recession



No longer met
DSM-IV criteria for
MDD



Physical exercise, medication or combination?



6 months after completion of the study, the participants in the exercise group were more likely to recover partially or totally and less likely to relapse



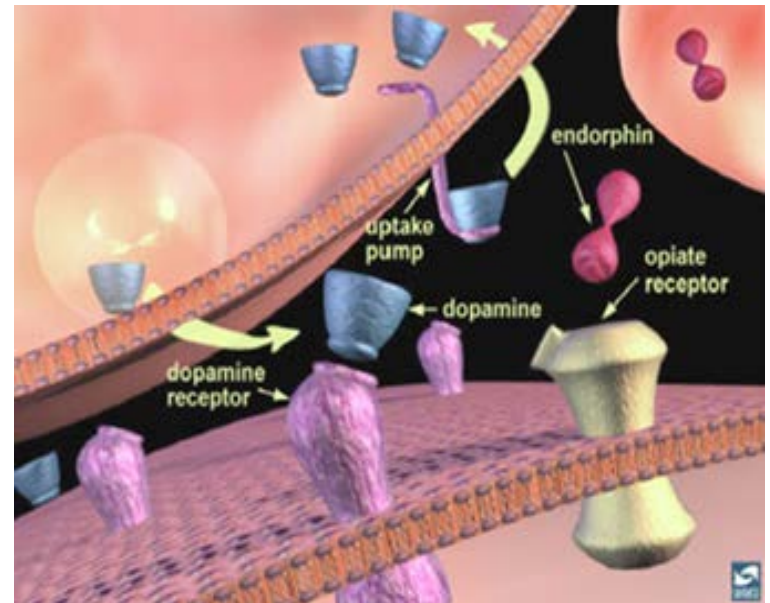
Possible biological mechanisms

Physical exercise :

- may affect central monoamine functioning (dopamine, serotonin, noradrenaline – “neurotransmitters of happiness”)
- may partially reduce depression by regulating the Hypothalamic-Pituitary-Adrenal axis response to stress
- contributes to the release of endogenous opioids such as β -endorphin

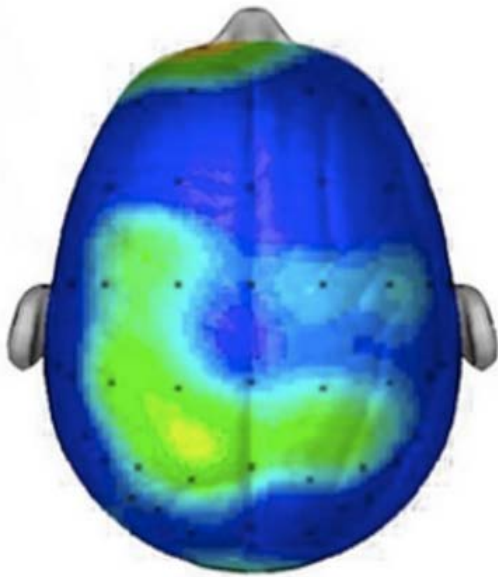


Mental Wellbeing

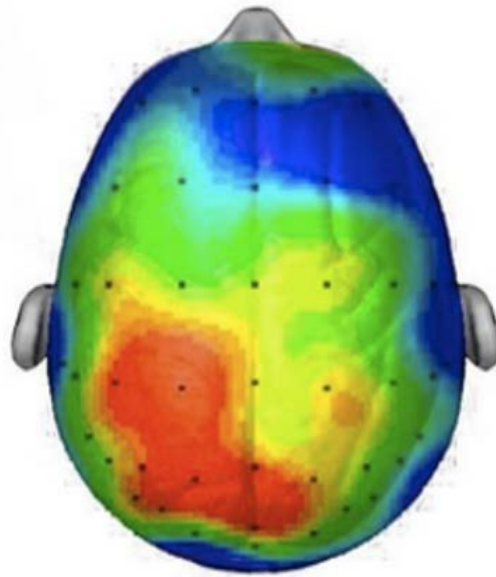


The effect of exercise on the brain

The brain before and after walking



After 20 min of sitting quietly



After a 20 min of walking

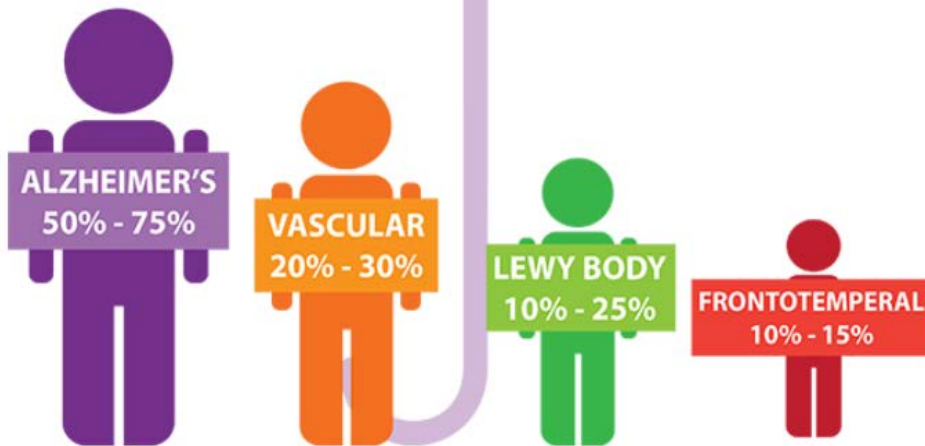
Specifically, exercise affects :

- Cognitive functions (attention, memory, speech, etc.)
- Academic performance
- Behavior

Dementia and Alzheimer's Disease (AD)

DEMENTIA

An "umbrella" term used to describe a range of symptoms associated with cognitive impairment.



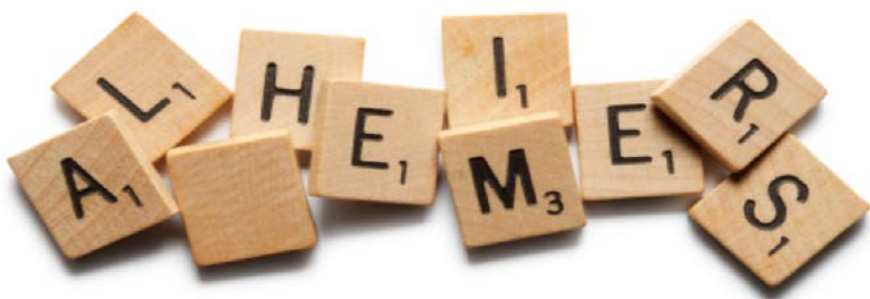
Dementia is defined as a serious disorder of the higher cognitive functions

Alzheimer's disease is a progressive neurodegenerative disease that affects memory, cognitive judgment etc.



The bodily functions gradually decrease, ultimately leading to death

AD is the leading cause of dementia in older ages > 65 followed by vascular dementia, LEWY body disease and frontal lobe dementia



2000-2013

- ❖ 71% increase in deaths due to AD
- ❖ 14% decrease in heart disease

Pharmacological treatment

Medication:

- slow the progression of AD in later stages
- contribute minimally on early stages of disease
- provide some symptomatic relief
- do not achieve a definite cure

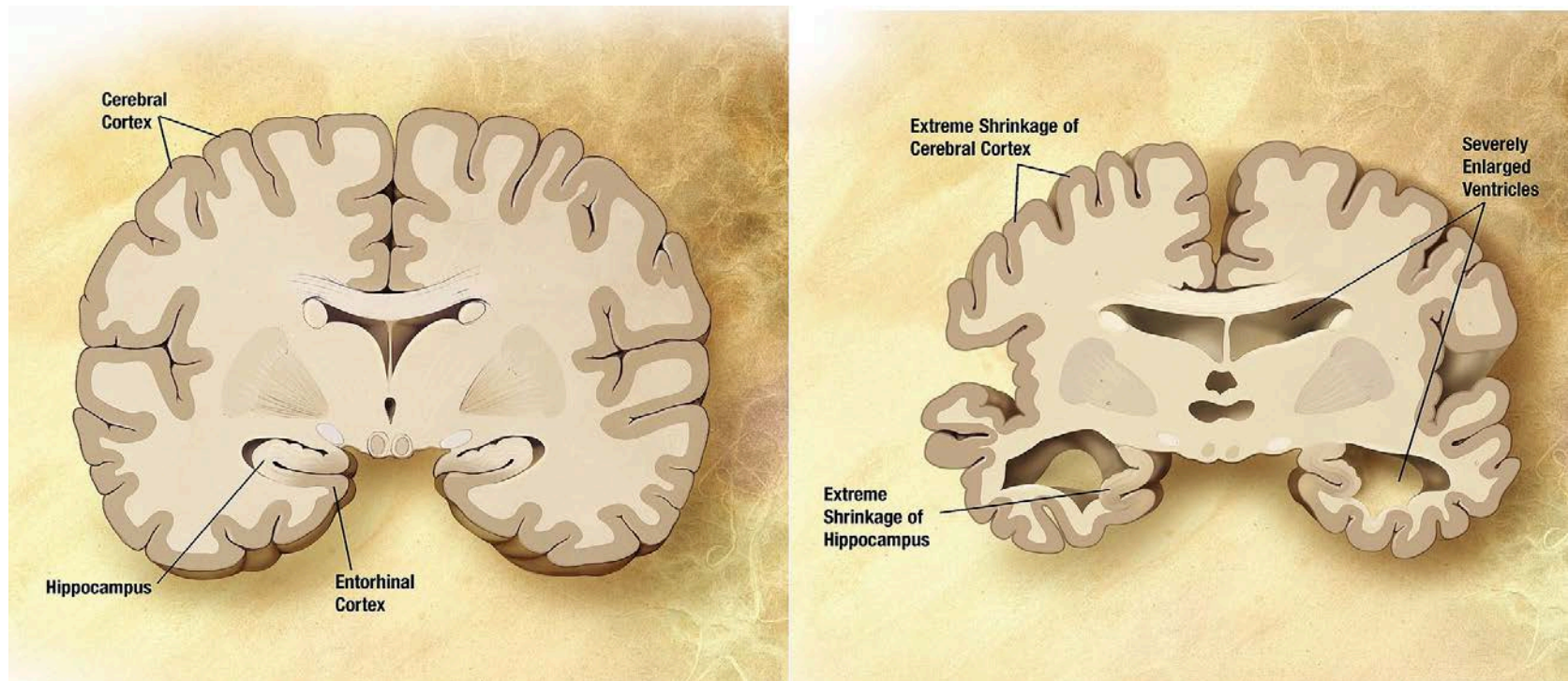
Exercise has been explored as a viable means of prevention and treatment for early-stage and late-stage disease due to:

- its relative safety with
- few side effects

Larger amount of research for the drug efficacy

Exercise may affect :

- Physiology of cardiovascular system
- Hippocampal volume and neurogenesis

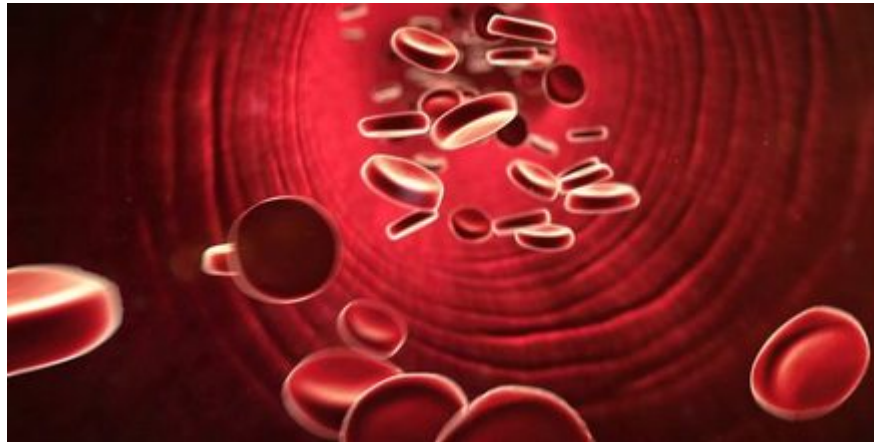


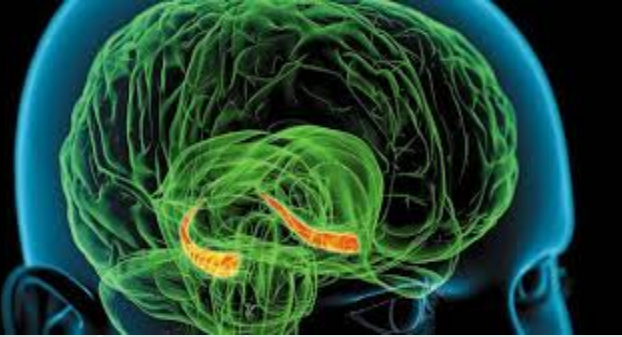


Physiology of cardiovascular system

Adverse effects of aging on brain blood flow and cognition

Moderate-intensity exercise results in acute augmentation of blood flow to the brain





Hippocampus

Crucial in learning and
memory

Volume

Neurogenesis

It has been shown that a large volume of the hippocampus is associated with better cognitive function

Mild-to-moderate exercise over a period of 1 year appears to prevent hippocampal atrophy (Duzel et al., 2016) and increases hippocampal volume (Erickson et al., 2009)

Research in mice has shown that exercise enhances the formation of new neurons



Results of studies

- Physical activity, even of mild or moderate intensity, is a means of preventing dementia, a priority by the G8 nations (Norton et al., 2014)
- It is not clear whether this effect depends on the frequency or intensity of the exercise (Smith et al., 2010)
- However, higher levels of PA appear to reduce the risk of impairment of cognitive functions
- Significant benefits in patients with Mild Cognitive Impairment or increased risk of AD (Yaffe et al., 2001)



Results of studies

- Leisure-time physical activity was particularly protective against AD but
- This is not the case with work-related PA -Individuals who are physically active at work tend to be more sedentary during leisure time
- Leisure-time physical activities have been indicated also as important sources of social and cognitive stimulation
- PA performed across the whole life span may contribute to maintenance of cognitive function in old age



Schizophrenia and other Psychotic Disorders

Schizophrenia is a severe mental disorder, characterized by profound disruptions in thinking, perception, emotions, language, the sense of self and behavior

Affects more than **21 million people** worldwide

It often includes:

- ❖ Hallucinations (mainly acoustic)
- ❖ Paranoid ideas
- ❖ Disorganized thought and speech



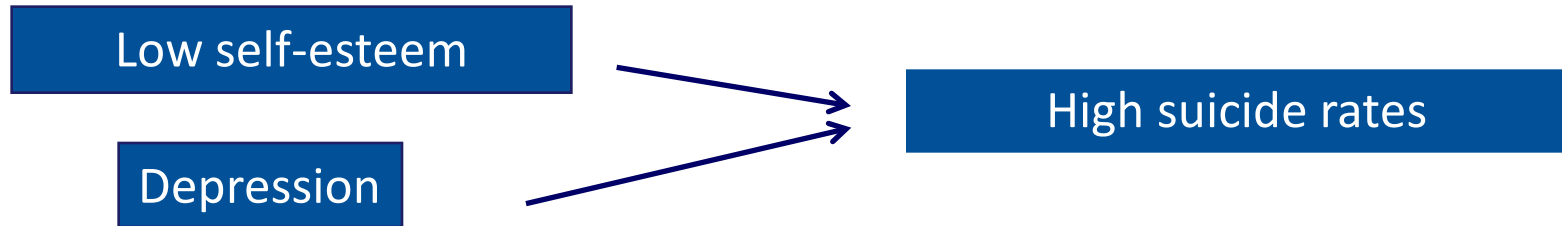
Serious problems in social interaction



Schizophrenia

Social isolation - stigma

Individuals experience daily rejection and contempt from their social environment



Schizophrenia typically begins in late adolescence or early adulthood

It is a treatable disorder

1 in 2 people living with schizophrenia does not receive care for the condition



Physical Exercise and Schizophrenia

- Cognitive dysfunction is a cardinal feature of schizophrenia that primarily affects verbal learning, memory, attention, processing speed, and executive function
- There is abundant research confirming the effects of aerobic exercise on cognitive and brain plasticity

A study examined the immediate and maintenance effects of AE on patients with schizophrenia, implementing a 12-week intervention program (3-6 times/week)

Participants completed assessments at pretest, posttest and 3-month follow-up

Group A

Moderate-intensity treadmill
exercise

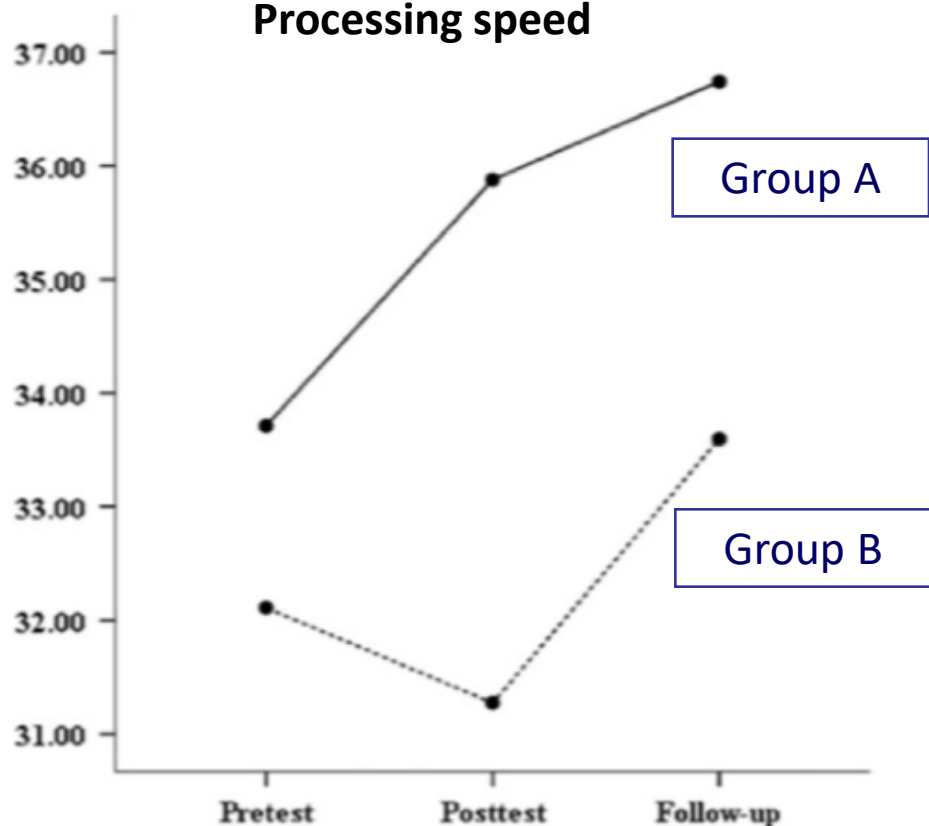
Group B

Stretching and toning
exercise

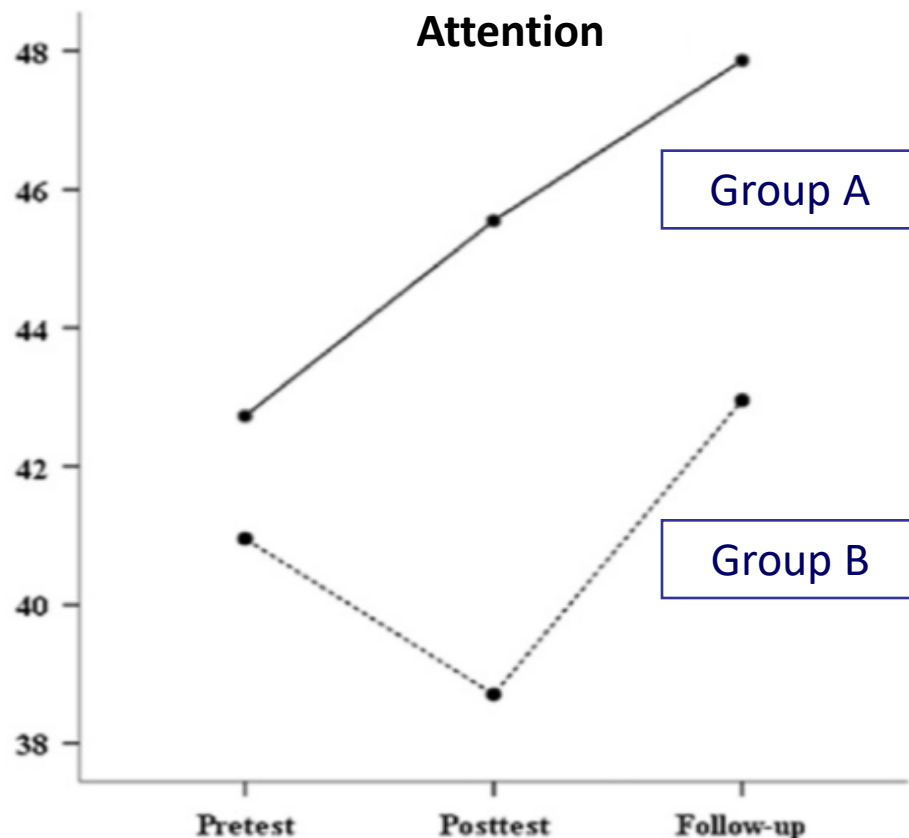


Physical Exercise and Schizophrenia

Processing speed

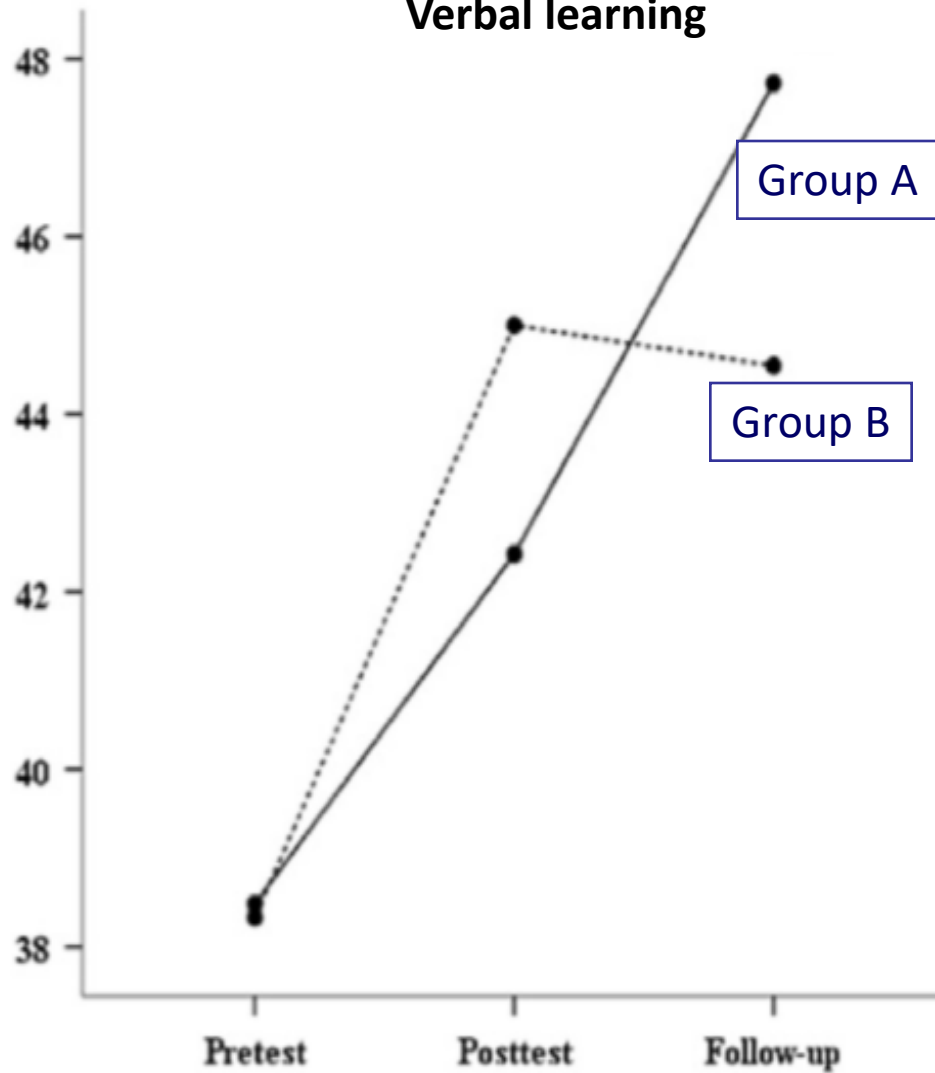


Attention

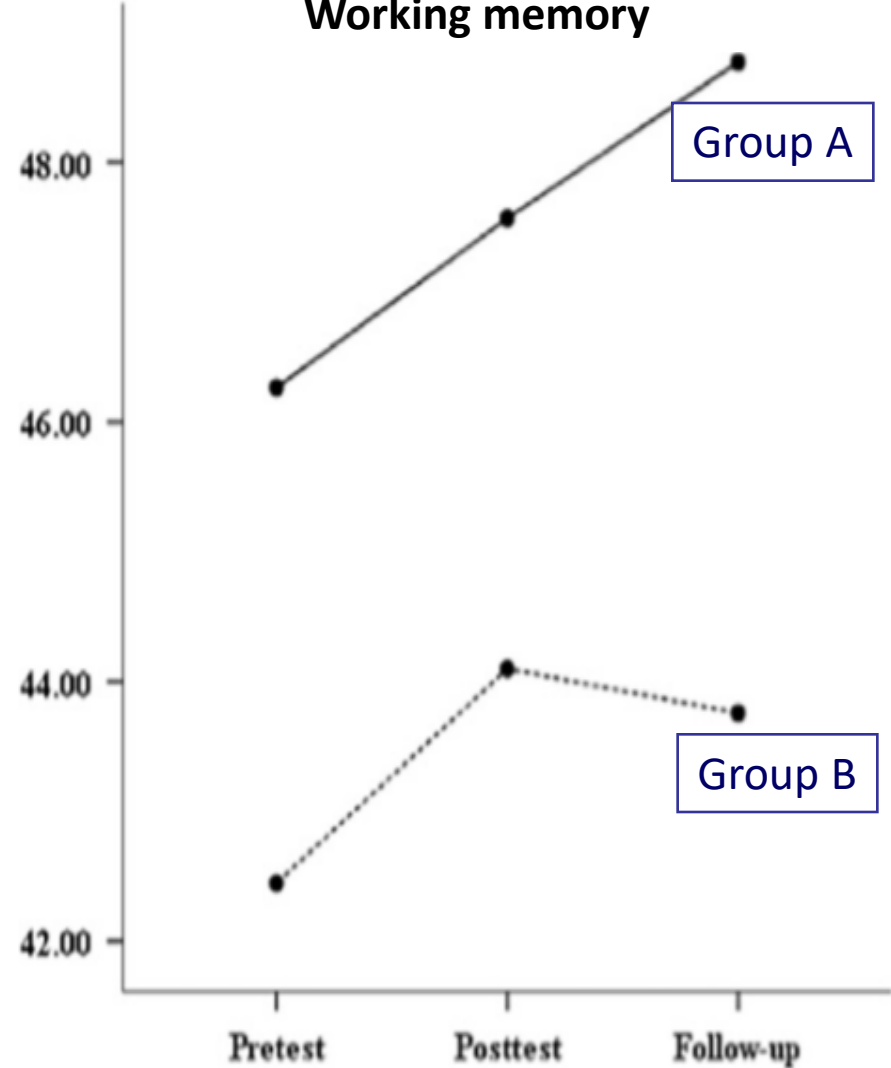


Greater improvement in Group A, 3 months after the implementation of the program (processing speed and attention)

Verbal learning



Working memory



Improvement in learning and memory was observed only in Group A, 3 months after the implementation of the program



The effects of Digital Interactive Games (exergames) on Schizophrenia

Patients with schizophrenia engage in less physical activity compared with the general population

They have no interest in developing their health or improve their body image due to the depressive and anxiety disorders that usually coexist

A study in schizophrenic individuals showed that the exergames:

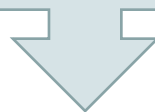
- ✓improved the mood of the participants
- ✓reduced feelings of tension and anxiety
- ✓improved their self-confidence and sociability
- ✓motivated the participants to continue to exercise with the exergame or with some sport after the end of the study



Psychosis

A study with data from 46 countries (low and moderate income-LMICs) and 204,186 participants aged 18–64 years showed that:

Psychosis diagnosis (especially among males) is associated with physical inactivity



Increased Risk

Obesity

Diabetes

Cardiovascular disease

Chronic diseases

Early death



Psychosis

PA is important for the prevention and treatment of psychotic disorders especially in lower-middle income countries

Only 0,5-2% of the health budget is allocated to the treatment and prevention of these disorders in LMICs

Cases not treated exceed 90%

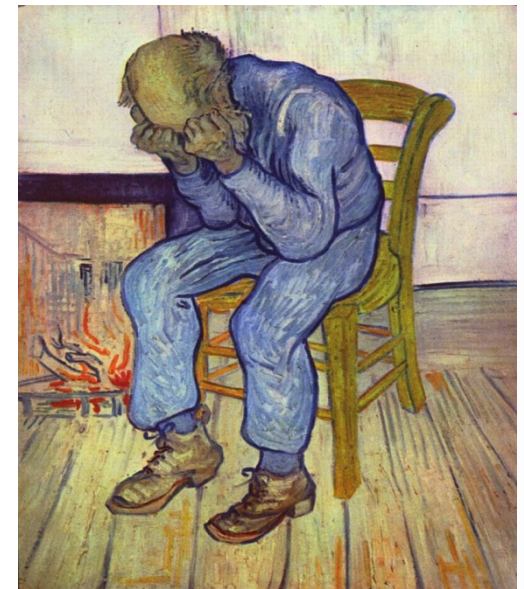
Scientists recommend:

- ✓the increase of PA in daily life for patients with psychotic disorders
- ✓continued medical education to equip staff on the importance of PA
- ✓implementation of customized programs in public health care institutions



Bipolar disorder

- Bipolar disorder (or **manic depression**) is a chronic psychiatric condition associated with severe disability and high mortality rates
- Individuals experience episodes of elevated mood (mania) alternating with episodes of depression
- These episodes are associated with deficits in patients' quality of life
- It is estimated that the proportion of the adult population suffering from the disease is 4% - 6%
- Bipolar disorder often develops in a person's late teens or early adult years



«At eternity's gate»

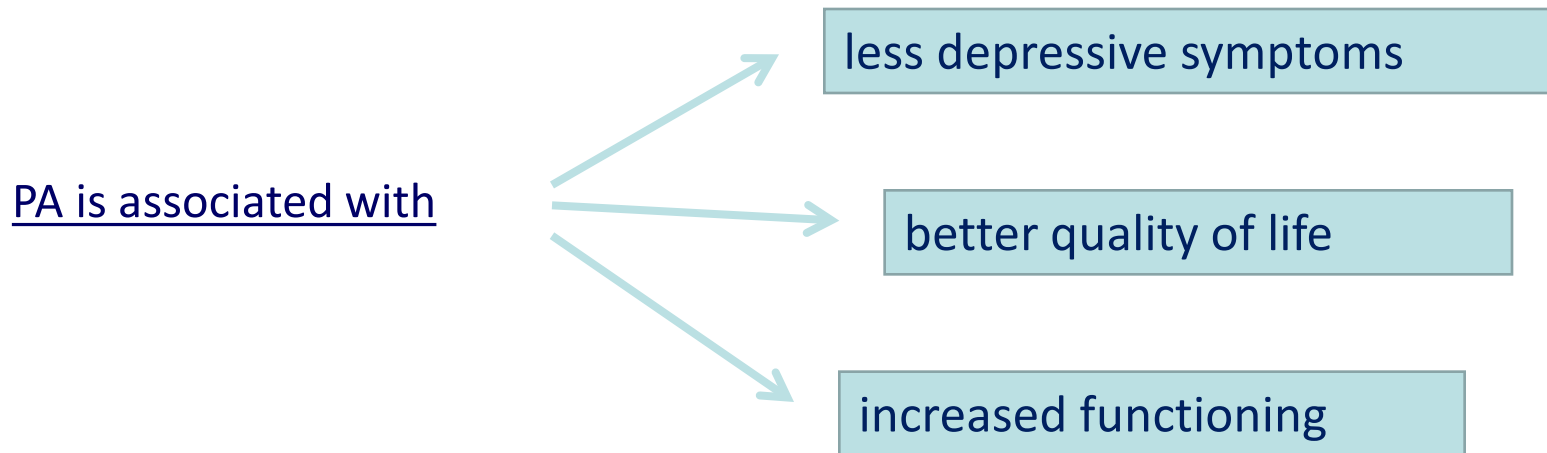


Bipolar disorder and exercise

Pharmacotherapy is burdened by significant side effects, such as contributing to one's risk of cardiovascular disease which leads to high rates of morbidity and mortality

Regular physical activity is associated with lower risk for premature mortality and improves risk factors for cardiovascular disease

Studies on the effect of PA on course of the disease indicate that:



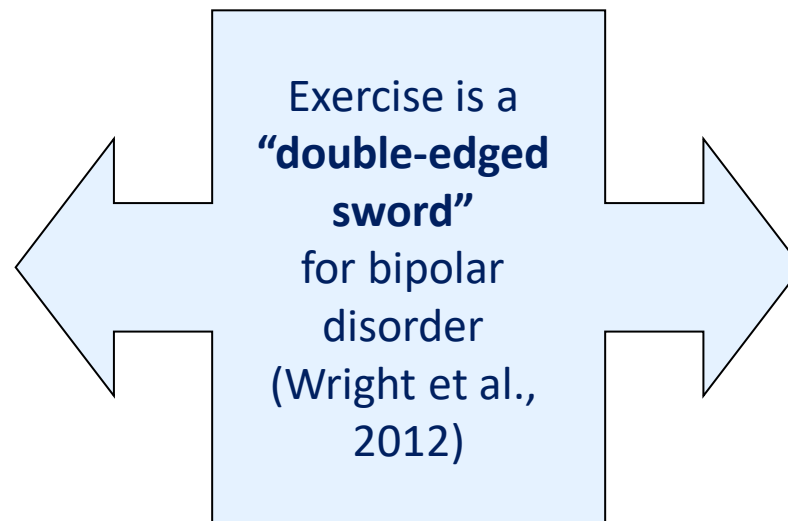


A complex relationship

Individuals in a manic or hypomanic state tend to be exercising at greater frequency than individuals currently depressed suggesting a complex relationship between bipolar disorder and PA

Regulate their emotions

Bring structure to their chaotic lives



Stimulate them with affective dysregulation

Increases body energy

Is associated with more manic symptoms



Scientists suggest:



- Personalized and targeted interventions-exercise programs
- Increasing exercise for patients with depressive symptoms
- Decreasing exercise for patients with mood elevation symptoms

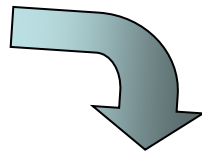


Autism spectrum disorders

Individuals with autism spectrum disorders (ASD) may be at risk for being physically inactive due to social and behavioral deficits often associated with the condition

Studies have shown that PA in people with autism is beneficial not only in terms of physical health but also in terms of decreased maladaptive behavior

Jogging, swimming, lifting weights, stationary bike riding...



- Reductions in stereotypy, aggression and maladaptive behavior
- Improving academic performance and motor behavior



Effective Exercise Programs

- The effect of a gait exercise program with **goal-setting** and **reinforcement** was examined in a sample of young adults (21-26 years) with autism
- By the end of the initial intervention condition all of the participants were walking 10,000 or more steps/day equivalent to more than 30min exercise

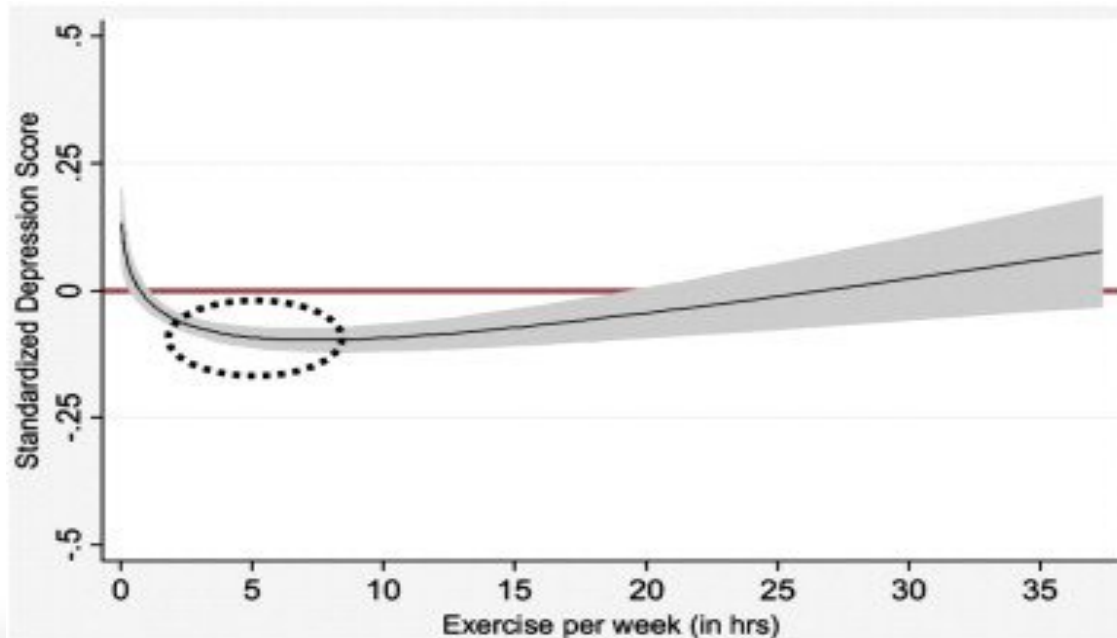
The findings suggest **simple exercise programs** easy to implement, effective with low cost





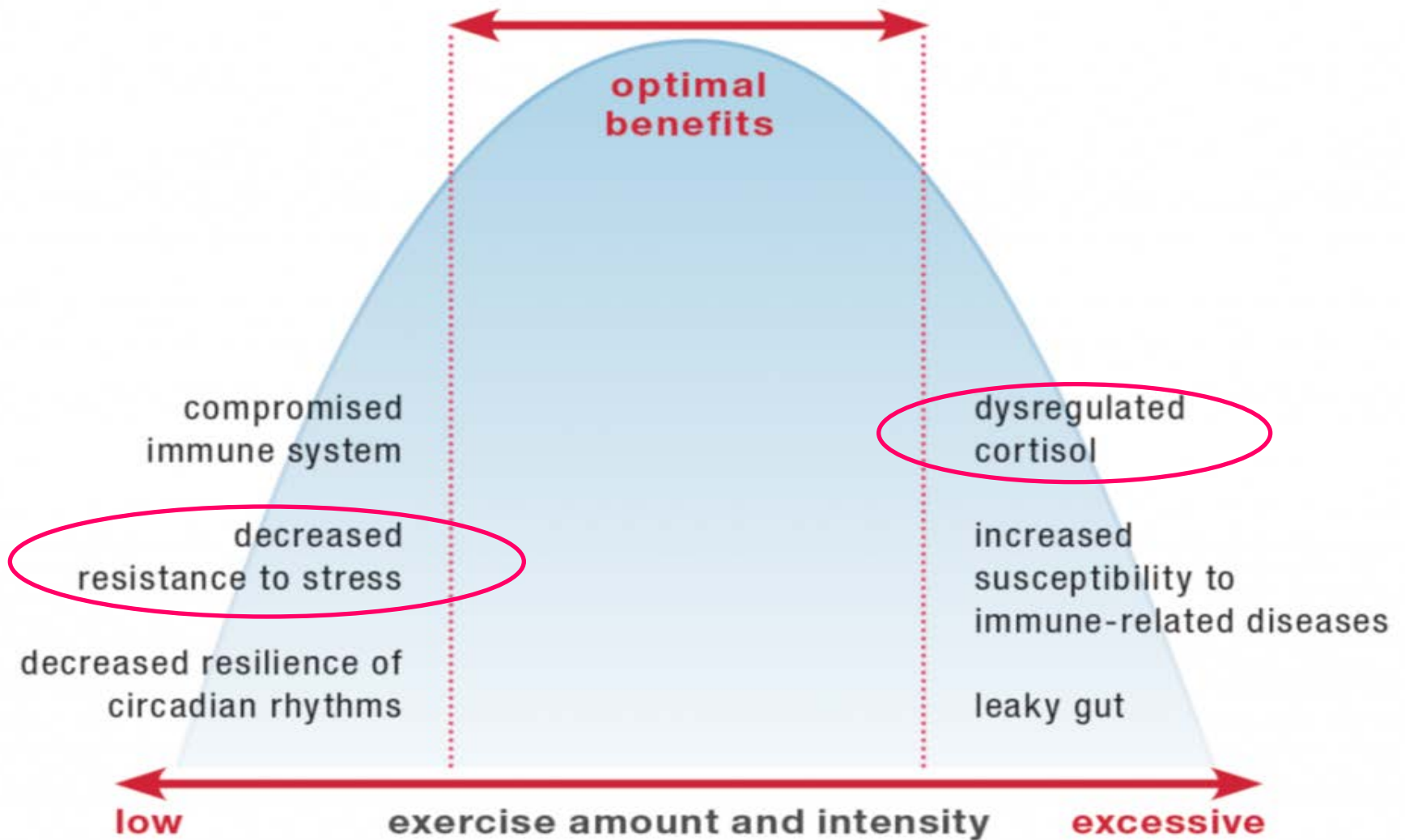
How Much Exercise is Best for Mental Health?

- There is a minimum level of exercise for physical health-related benefits
- Increasing levels of exercise lead to additional benefits
- Curvilinear association between physical activity and mental health
- Excessive exercise can be harmful to both physical and mental health



Optimal range: 2.5 to 7.5 hours/week

Happy Medium



Mens Sana in Corpore Sano...

In conclusion:

- The number of patients suffering from mental illness constantly increases
- There is an urgent need for applying alternative, non-pharmaceutical interventions
- PA can be utilized as a means of preventing and enhancing the treatment of mental illness
- PA enhances MH and reduces the risk of mental disorders
- It is a treatment without “side effects” and financial costs
- It does not stigmatize



Mens Sana in Corpore Sano...

- The relationship between PA and MH varies according to the different combinations of the exercise characteristics
- Excessive exercise can lead to opposite results
- Although the number of studies (for the effectiveness of PA) is limited compared to the number of studies for the drug efficacy in mental illness, it has been shown that:

The understanding of the specific factors that affect the above relationship facilitates:

The development of specially designed (customized) PA programs and guides

The improvement of the PA effectiveness as an alternative, non-costly prevention and treatment approach



**Thank you for your
attention**

