

# DEPRESSION AND PHYSICAL EXERCISE

## DEPRESIÓN Y EJERCICIO FÍSICO

France Willian Ávila do Nascimento<sup>1</sup>, Andréa Araújo dos Santos<sup>2</sup>

<sup>1</sup>Universidade Federal do Acre-Acre, Brasil.

<sup>2</sup>Universidade Privada Aberta Latinoamericana- Cochabamba, Bolívia.

### Resumo

A depressão é definida como um transtorno que provoca alterações sociais, psicológicas, fisiológicas e biológicas. Pessoas diagnosticadas como depressivas têm impactos no funcionamento psicossocial, na saúde física, na mortalidade e na qualidade de vida. Na busca por um tratamento não farmacológico, o exercício físico tem se mostrado relevante no tratamento desta doença. Trata-se de uma revisão de literatura utilizando as bases de dados PubMed, Scielo, Periódico da Capes, Google Acadêmico e livros publicados no período até o ano de 2022. O objetivo deste estudo é investigar os benefícios do exercício físico para mulheres. pessoas que apresentam depressão e aborda as possibilidades que a Educação Física proporciona para a prevenção dessa doença, pois os exercícios favorecem o desenvolvimento não só do corpo, mas também da saúde mental das pessoas.

**Palavras-chave:** Depressão. Saúde. Exercício físico.

### Abstract

Depression is defined as a disorder that causes social, psychological, physiological and biological changes. People diagnosed as depressive have impacts on psychosocial functioning, physical health, mortality and quality of life. In the search for a non-pharmacological treatment, physical exercise has been shown to be relevant in the treatment of this disease. This is a literature review using the databases of PubMed, Scielo, Periódico da Capes, Google Scholar and books published in the period up to the year 2022. The aim of this study is to investigate the benefits of physical exercise for women. people who have depression and addresses the possibilities that Physical Education provides to prevent this disease, as exercises favor the development not only of the body, but also of people's mental health.

**Key words:** Depression. Health. Physical Exercise.

## Introdução

Depression is characterized by being a multifactorial psychopathology, that is, it is a mental disorder that causes mood swings in addition to promoting deep sadness, feelings of pain, low self-esteem, anguish, sleep disturbances, appetite disorders, crying spells and even lack of concentration in performing daily tasks (MONTEIRO et al., 2021).

Because it is a silent and hidden disease, people who suffer from this pathology still try to hide and even deny that they are being affected to avoid embarrassment, making the suffering more intense because it is not shared with other people (LIMA, 2000).

Experts argue that the involvement of depression throughout life is 16% to become a chronic problem, the subject has a life expectancy of 10 to 17.5 years shorter compared to people considered normal (MONTEIRO et al., 2021).

Research has concluded that there are three sets of most common symptoms: emotional, cognitive and physical symptoms, so the patient must present all of them to be diagnosed with this pathology. Experts claim that it can last for days or even last a lifetime, directly interfering with social, personal, professional life and sometimes leading to suicide (PARAMI, 2021).

Other main symptoms can be evidenced by deep sadness, loss of interest in daily activities, sleep disturbances, muscle fatigue even without having done any physical activity, feelings of guilt, unhappiness, lack of concentration, in addition to the desire to cause harm to oneself. and in more serious cases the person commits suicide. The 2019 National Health Survey found that 10.2% of the population were diagnosed with depression by mental health professionals (MALTA, 2021).

The Ministry of Health (2019) states that the period with the highest chance of the appearance of this disorder is at the end of the third decade of a human being's life, but recent studies have concluded that it can start at any age and regardless of race, color or gender. Research indicates a prevalence of up to 20% in women and 12% in men.

The World Health Organization (WHO, 2003) estimated that by 2020 depression would be the most prevalent disease worldwide. Currently, more than 120 million people suffer from depression in the world, already in Brazil there are more than 17 million. Studies indicate that about 850,000 people die each year due to serious conditions resulting from the disease.

The World Health Organization also points out that depression is one of the most prevalent disorders worldwide, ranking second in terms of the degree of lethality, behind only heart problems. Its prevention and treatment is very variable due to the most varied cases and levels of severity, in some cases the person does not accept the diagnosis and ends up omitting the treatment, making maintaining the health of these people a great challenge (PARAMI, 2021).

Expenditure related to mental health accompanied by spending on medication has been increasing, for many people long-term medication does not promote health benefits, and can cause side effects such as obesity, increased blood glucose levels, among others. (SCHUCH, 2021)

Depression was first described by the scientific community at the beginning of the 20th century, confused with sadness, which is a very common feeling in people. The lack of knowledge related to this affective disorder is one of the biggest problems for those who suffer from this pathology. Andrade (2011, apud Sadock, 2007) comments on the age groups in which the first symptoms usually appear:

The average age of onset for major depressive disorder is 40 years, with 50% of all patients having onset between the ages of 20 and 50. Major depressive disorder can also start in childhood or later in life. Recent epidemiological data suggest that its incidence may be increasing among people under 20 years of age. This may be related to the increased use of alcohol and drugs in this group (p.574).

This psychological illness affects an individual's emotional state, leaving him unable to feel pleasure in staying alive, altering his physiological functioning and being the main cause of the psycho-physical disability index according to the World Health Organization. Despite being a

complex pathology, it is already known about some conditions that increase the risk of an individual developing the disease, some of them are biological, genetic and psychosocial factors (GUARIENTE, 2000).

Biological factors are described as some chemical dysfunctions of the brain that can be caused by side effects of medications or excessive consumption of alcohol, energy drinks and illicit drugs. Genetic factors are directly related to the hereditary history of people with relatives diagnosed with depression, who may be the most vulnerable to developing the disease. Psychosocial/environmental factors are caused by high-stress events such as the death of loved ones and past or present psychological trauma. All these factors influence the evolution of depressive conditions (HERCULANO, 2004).

However, there are also factors that are able to minimize its effects. One of them is the regular practice of activity or physical exercise in which it helps to prevent and combat depression, it is important to always be accompanied by an accredited and trained professional so that the objectives are achieved, providing an excellent therapeutic effect. In this sense, Da Silva Oliveira (2014) comments that:

Physical activity can influence depression in two ways: with preventive value (it is used as protection against the development of depressive symptoms) and as "treatment", through psychological and/or biological mechanisms. Among the psychological factors, activity intervenes in the distraction of stressful stimuli, greater control over your body and your life and social interaction - provided by living with other people. Biological factors are related to the effect of endorphins. Endorphin has an effect similar to morphine, which can reduce the sensation of pain and produce a state of euphoria. Depression is also related to impaired transmission at some central aminergic synapses, due to defects in the production, transfer or loss of amines. There is also the biological hypothesis that physical exercise associated with treatment improves the alteration of one or all brain monoamines (such as serotonin and noradrenaline), since these substances are neurotransmitters (as well as dopamine and endorphins). and are related respectively to satisfaction, pleasure, sleep, mood, appetite, etc. (p.2).

The regular practice of physical exercises causes changes and adaptations in all systems of the human body, whether in the respiratory, cardiovascular, neurological, circulatory or mainly in the muscular system. Recent studies have concluded that exercises performed five times a week help regulate cortisol levels. Pereira Junior (2009) explains:

During dynamic exercise, marked changes in cardiovascular control by the autonomic nervous system are observed, with increased sympathetic activity and reduced parasympathetic activity, increasing heart rate, cardiac output and systolic blood pressure. One can also highlight the redistribution of peripheral blood flow during exercise, a factor that, in addition to autonomic modulation, is also largely dependent on local mechanisms.

In this way, the objective of this study was to investigate the benefits of physical exercises for people with depression and as specific objectives to analyze the benefits in the recovery and prevention of depression.

## Methodology

This is a narrative review using PubMed, Scielo, Periódico da Capes, Google Scholar and books published in the period up to 2022. This review focused on highlighting the importance of physical exercise in prevention and treatment of depression. Thus, a search was carried out for articles published in the Scientific Electronic Library Online (SciELO), BVS (Virtual Health Library) and Google Scholar and LILACS (Latin American and Caribbean Literature in Health Sciences) databases.

For the search, the isolated descriptors "Depression", "Physical Exercise", "Treatment" and "Prevention" were used. Complete articles were selected, in English, Spanish and Portuguese

that addressed the theme. Incomplete articles, which were repeated in the databases or which did not address the topic, were excluded.

### Depression and exercise

Depression is a mental disorder that occurs through an internal conflict and causes a biochemical change. This disease has characteristics of activating some regions in the brain causing deep sadness and often without reasons. Studies have found that patients with depression have a deficit of brain activity occurring in the prefrontal cortex region on the left side, reducing positive feelings (HERCULANO, 2004).

The nervous and endocrine systems are responsible for most of the functions of the human body, the main cells of these systems are the neurons which synthesize substances called neurotransmitters. Physiology explains that the main neurotransmitters capable of influencing the emotions of individuals are serotonin, noradrenaline, dopamine and endorphins. Werneck Neto (2009, p. 66) comments that dopamine is a neurotransmitter with great influence on the symptoms of depression:

"Dopamine is a neurotransmitter with an important role in brain motor control functions, cognition and the reward system. In addition, they have a decisive influence on the pathology of schizophrenia and depression [...] as is known, they are the mesolimbic and mesocortical pathways that modulate affectivity, behavior and cognition [...]"

Thus, there is a decrease in the production of these substances, impairing the propagation of nerve impulses from one cell to another. The levels of serotonin produced by the brain determine the main changes in mood, anxiety, anger, sleep, tiredness and others. In this way, this mental illness is caused by failures in the neurotransmitters that provide the feeling of well being (GUARIENTE, 2000).

The two populations in which this disorder predominates are young adults, due to the constant routine of stress caused by expectations of academic performance, poor diet, sedentary lifestyle and economic problems. And the other population is women, who are more prone to the development of anxiety disorders, hormonal changes, in addition to the social pressure of working, studying and taking care of the family (ERDOĞAN, 2020).

In this context, physical exercise appears as an alternative that stabilizes and stimulates the regulation and production of these hormones. Research points out that the regular practice of some physical activity or exercise can induce the production of dopamine, noradrenaline and other neuropeptides that are other substances produced and transmitted through brain cells, such as endorphins that provide a feeling of well-being to practitioners (KHALMA, 1997). Exercises and physical activities are generally treated with the same concept, however they do not have the same definition (NASCIMENTO, et al., 2022).

**Physical activity:** It is any human behavior that involves muscle movements to perform a task without following a pattern and that are done intentionally, it is not something programmed but a natural action that happens due to the need of the human being, such as walking, running and throwing. However, involuntary movements such as breathing and movements performed by the stomach, eyelids and heart contractions are not considered (SANTOS, et al., 2022).

**Physical exercise:** It is a systematized, planned activity, with a series of repetitions, determined time and with a specific objective. Physical exercise is able to promote increased physical skills such as muscle mass, increase the efficiency of the cardiovascular system and improve the immune system with regular practice. Some examples are bodybuilding, crossfit, gymnastics, football, swimming, etc. reinforcing the difference between these concepts Cheike (2003) says:

It is worth highlighting the importance of discerning between the concept of Physical Activity, which is a generic expression that can be defined as any body movement produced by skeletal muscles, which results in energy expenditure greater than resting levels, and Physical Exercise (a of its main components), which is a planned, structured and repetitive

physical activity whose final or intermediate objective is to increase or maintain health/physical fitness.

Exercises still have a subclassification and can be aerobic and anaerobic. Aerobic exercise uses the oxidative system as the main source to generate muscle energy, in addition to being continuous, more of low or moderate intensity. Examples are dancing, swimming, step classes, etc. (SANTOS, 2022).

Anaerobic exercises are performed with high intensities within short periods of time, where their main sources of energy are the alactic and glycolytic anaerobic systems, which are characterized by not needing a continuous supply of oxygen to obtain energy. Some examples are the 100-meter run and bodybuilding at the gym (NASCIMENTO, 2022).

Woolston (2016) emphasizes that in order to obtain an improvement in an individual's mood and social life through physical exercise, it is important for him to practice a sport that he identifies with, promoting his joy and feeling of satisfaction during his practice.

## Discussion

Several studies seek to identify how cognitive function improves in response to activities or physical exercises. Physiologically, during practice, an increase in the transport of oxygen through hemoglobin to the brain occurs in the body, followed by protein synthesis, activation of neurotransmitters by the nervous system and release of serotonin. (MELLO, 2005).

Regular practice, or at least three times a week, is essential for maintaining health and preventing numerous diseases. Several scientific studies highlight the benefits for the body and mind of individuals who practice some type of activity, sport or exercise. The researchers also investigate how physical inactivity is a risk factor for the development of cardiovascular, metabolic and mental diseases (NASCIMENTO, 2022).

The objective of exercise and physical activity in the treatment or prevention of depression is related to two pillars: depression reduces the practice of physical activities; physical activity can be an alternative for preventing or treating depression. In this sense, Antunes (2014) states that physical exercises as a treatment for depressive symptoms promote savings for public coffers due to the low demand for care at public health centers and hospitals.

Schuch et. al. (2019) evaluated tests to verify the effects of physical exercise in the treatment of depression symptoms and as a result, an improvement in sleep quality, increased self-esteem and socialization with other people was proven. However, the researchers point out that the implementation of the exercise routine is not easy to apply and has a higher dropout rate when compared to other clinical populations.

In the study by Ferreira et. al. (2014), in different groups of practitioners of bodybuilding, hydrogymnastics, aerobics and pilates, concluded that only the aerobics group obtained a lower score on the depression scale when compared to the other modalities, however there was an improvement in the mental health of all participants. research participants.

Aan Het Rot et. al. (2009) concluded that regular physical exercise can be effective in reducing symptoms in patients with major depressive disorder. The US Department of Health and Human Services recommends 2.5 hours of moderate-level aerobic exercise.

Belvederi Muri et. al. (2019), state that exercise is able to neutralize several psychological mechanisms promoting a decrease in mortality in depression and can be as effective as drug treatments, in addition to being free of adverse side effects. Ranjbar et. al. (2015) recommends that before prescribing exercise as a treatment for depressive cases, variables such as methodological control, social, biological and cultural issues should be analyzed in order to choose the best intervention.

In the study by Ribeiro et. al. (2017), consisting of 16 sessions of stretching exercises, gymnastics, weight training, dance classes, circuits and relaxation exercises, consisting of 3 sessions per week, lasting 60 minutes per session and of moderate intensity, was efficient in reduce depressive symptoms. Woolston (2016) highlights:



[...] in a Norwegian study of more than 40,000 people, researchers found that people who engage in regular physical activity in their leisure time were less likely to have symptoms of depression. Exercise intensity level made no difference, but they seemed to benefit more when they had higher levels of social support and engagement.

Carneiro et. al. (2018), states that physical exercise is a great treatment for depression, whether done in cases of prevention, mild or severe. He also highlights the importance of monitoring Physical Education professionals performing an integration with mental health teams. Participants highlight that the main benefit of exercise for patients with depression is filling the emotional void.

## Final Considerations

According to the research presented, cases of depression have grown uncontrollably all over the world, with Brazil in fourth place in the world ranking. Currently, the world is experiencing enormous tension due to the Coronavirus pandemic, where people have experienced social isolation and the loss of loved ones.

In this sense, physical activities and exercises proved to be beneficial and approached as a great ally for the prevention and treatment of depressive conditions. Research has concluded that supervised exercise improves the quality of life of human beings, in addition to being able to promote the prevention and reduction of depressive symptoms in people.

However, it is important to carry out new studies that use other variables such as a homogeneous population, scales, exercise monitoring, brain mapping and among other tools to seek the best diagnosis for this disease that has been affecting trillions of people around the world.

## References

ANTUNES, Hanna Karen Moreira et al. Low oxygen consumption is reflected in depression scores in the elderly. *Brazilian Journal of Geriatrics and Gerontology*, v. 17, p. 505-515, 2014.

ANDRADE, Ribeiro Talita. Physical exercise in the treatment of depression: A literature review. Monography. Campinas State University. 2011.

AAN HET ROT, Marije; COLLINS, Katherine A.; FITTERLING, Heidi L. Physical exercise and depression. *Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine: A Journal of Translational and Personalized Medicine*, v. 76, no. 2, p. 204-214, 2009.

BELVEDERI MURRI, Martino et al. Physical exercise in major depression: reducing the mortality gap while improving clinical outcomes. *Frontiers in psychiatry*, v. 9, p. 762, 2019.

CARNEIRO, Lara F. et al. Portuguese and Brazilian guidelines for the treatment of depression: exercise as medicine. *Brazilian Journal of Psychiatry*, v. 40, p. 210-211, 2017.

CHEIK, Nadia Carla et al. Effects of physical exercise and physical activity on depression and anxiety in elderly individuals. *Brazilian Journal of Science and Movement*, v. 11, no. 3, p. 45-52, 2003.

DA SILVA OLIVEIRA, Márcia Cristina; WINIAWER, Fabiana Budy. Body and mind management with Yoga: an approach to health, well-being and quality of life. *Journal of Teaching, Education and Human Sciences*, v. 16, no. 3, p. 201-207, 2015.

ERDOĞAN YÜCE, Gülyeter; MUZ, Gamze. Effect of yoga-based physical activity on perceived stress, anxiety, and quality of life in young adults. *Perspectives in psychiatric care*, v. 56, no. 3, p. 697-704, 2020.

FERREIRA, Lilian et al. Evaluation of depression levels in elderly practitioners of different physical exercises. *Conscientiae Saúde*, v. 13, no. 3, p. 405-410, 2014.

GUARIENTE, Júlio César Arroyo. *Depression: from symptoms to treatment*. House of the Psychologist, 2000.

HERCULANO, Suzana. *Our everyday brain: neuroscience discoveries about everyday life*. 2004.

KHALMA, Dharma Singh; STAUTH, Cameron. Brain longevity. In: *Longevity of the Brain*. 1997. p. 451-451.

LIMA, Mauro Aranha de. *Psychopathology and semiology of mental disorders*. 2000.

MONTEIRO, Fernanda Castro et al. Factors associated with adherence to sports and exercise among outpatients with major depressive disorder. *Trends in psychiatry and psychotherapy*, v. 43, p. 108-115, 2021.

MALTA, Deborah Carvalho et al. National Health Survey 2019: sustainability and continuity of health monitoring of the Brazilian population. *Brazilian Journal of Epidemiology*, v. 24, 2021.

MELLO, Marco Túlio de et al. Physical exercise and psychobiological aspects. *Brazilian Journal of Sports Medicine*, v. 11, p. 203-207, 2005.

NASCIMENTO, FW Ávila do .; SANTOS, AA dos. The benefits of physical exercise in patients with chronic kidney disease: a literature review. *Ibero-American Journal of Humanities, Sciences and Education*, [S. l.], v. 8, no. 1, p. 1446–1455, 2022. DOI: 10.51891/rease.v8i1.3989.

MINISTRY OF HEALTH. *Depression: causes, symptoms, treatments, diagnosis and prevention*. Website <http://saude.gov.br/saude-de-az/depressao>, 2019.

PEREIRA JUNIOR. *Physiological effects of recent exercise*. 2009. Available at: <http://www.proximus.com.br/news/node/82>. Accessed on: 2 Apr. 2022.

PARAMI, Sharareh et al. Identifying factors associated with the hospital readmission rate among patients with major depressive disorder. *BMC psychiatry*, v. 21, no. 1, p. 1-9, 2021.

RANJBAR, Elaheh et al. Depression and exercise: a clinical review and management guideline. *Asian Journal of Sports Medicine*, v. 6, no. 2, 2015.

RIBEIRO, Cristiane Aparecida. *Effect of a physical exercise program on depressive symptoms, anxiety and cognitive functions in people with psychiatric disorders*. 2017.

SCHUCH, Felipe Barreto; VANCAMPFORT, Davy. Physical activity, exercise, and mental disorders: it is time to move on. *Trends in Psychiatry and Psychotherapy*, v. 43, p. 177-184, 2021.

SANTOS, AA dos .; NASCIMENTO, FWA do . *BIOMECHANICS OF RUNNING AND INJURIES RESULTING FROM MOVEMENT ERRORS: A BIBLIOGRAPHIC REVIEW*. *Ibero-American Journal of Humanities, Sciences and Education*, [S. l.], v. 8, no. 7, p. 1091–1101, 2022. DOI:

10.51891/rease.v8i7.6395.

Available

at:

<https://www.periodicorease.pro.br/rease/article/view/6395>.

SADOCK, Benjamin J.; SADOCK, Virginia A.; RUIZ, Peter. Compendium of Psychiatry: Behavioral Science and Clinical Psychiatry. Artmed Publisher, 2016.

WOOLSTON, Chris. Depression and Exercise. Depression, 2016.

World Health Organization. World report on violence and health. Geneva: WHO, 2003. ONU - Organization of the United Nations.

WERNECK NETO, ALS Treatment of depression and motor symptoms in parkinson's disease: a study with a 5-HT<sub>2A/C</sub> antagonist. 2009. 131 f. Thesis (Doctorate) - Medical Course, Federal University of Rio de Janeiro, Rio de Janeiro, 2009.

Received: 16/02/2024

Approved: 18/03/2024