



Personal Well-being

Aerobic and strength exercise program for people with depression and / or stress (B-SPORT +)

INFAD's expected intellectual output within the capacity development program.

1. INTRODUCTION (purpose, contextualization, comments from users....)

In Spain, the main cause of disability was found in mental health and neurological disorders such as depression, clinical stress disorders or anxiety. At the moment, due to the difficulties generated by the pandemic Infad, is not able to encounter sport club and associations which are immediately available to carry out a program of physical activity intervention with PwD. For this reason, Infad provides a provisional capacity building document based on empirical findings and theoretical framework available in two prominent databases for scientific research, namely Scopus and Google Scholar.

The general objective of the program is: the improvement of the quality of life and the perception of health in a group of patients with a stressful situation. Similarly, the specific objectives are:

- To make known through evidence that exercise is beneficial for health in general and for the clinical situation in particular.
- To sensitize the rest of the population about the advantages of physical exercise as a treatment for anxiety and stress.
- To create an aerobic and strength activity program for depressed people.

Finally, the effect to be achieved is:

- A greater social awareness of the benefit of physical exercise.
- A greater involvement of different groups in the sport and physical activity.
- A decreased morbidity associated with stress.
- An improvement of the social integration of people with stress.
- A general improvement in quality of life

Some of the comments of the users in relation to the question are the following: Do you consider it important to carry out physical activity in depressed or stressed people? Why?

- Users 1: Yes, I think that sport can improve your mood, escape your problems, worries or responsibilities. It is a time that you take for yourself, and that helps to self-confidence, to value yourself, to improve your mood and reduce your level of anxiety.
- User 2: I think it also depends on the person, when I have been depressed, doing sports alone was not very good for me, because at least I ate more coconut. In a group, well, of course, better, also depending on the day, but if it is important, then you feel good.
- User 3: Yes, because it helps the person to become uninhibited about the problems they may have and not to think so much about their head and also to improve physically and mentally, but that is always accompanied and with someone who can help-motivate you.



- User 4: It is a natural way to generate serotonin, which helps stabilize mood and sleep among other things. It's like taking pills without taking pills. A healthy body is a healthy mind!

2. NEEDS (Overview of problems, statistics, target group description)

In 2016, depression was found to be the leading cause of mental health-related illness worldwide (300 million people worldwide). When the WHO declared the COVID-19 pandemic in March 2020, the increase in depressive states was enhanced as a result of psychosocial stressors such as the interruption of daily life, fear of illness or fear of the economy (Carneiro et al., 2020).

Depression, anxiety and stress problems can appear due to various additional problems such as muscle tension or motor restlessness, subjective experience of nervousness, difficulty in maintaining concentration, irritability or sleep disturbances. Symptoms cause significant distress or significant impairment in areas of personal, family, social, educational, occupational, or other important functioning. Anxiety disorders with substantially elevated levels of anxiety symptoms are associated with a reduced quality of life and / or the risk of developing disabling diseases and may even increase the risk of death. Also, people with depression are at higher risk of becoming sedentary.

However, physical activity contributes to physical and mental health, being a very important element in preventing and reducing symptoms of anxiety disorders. This because patients feel that they participate in their own treatment, increasing the heart rate, respiratory rate and sweating, contributing to help them to normalize these clinical aspects of anxiety. Supervised practice and / or in small groups help with socialization, it is a distraction from the degree of attention of the patient to their symptoms. There are related biologically based explanations with the increase in VO₂ (aerobic capacity) and the release of myokines and neuromediators. In other words, physical activity is considered part of a healthy lifestyle and people with mental illness (not just anxiety),

Similarly, countless benefits of aerobic exercise have been recognized for depression. A meta-analysis demonstrated evidence that aerobic exercise for 12 weeks improves cardiorespiratory fitness in people with depression (Stubbs et al., 2016).

On the other hand, in terms of strength, the need for future studies investigating the relationship between strength training and depression is highlighted. However, findings from Kim, O'Sullivan and Shin (2019), recommend strength exercises in depressed people because neurotransmitter factors such as serotonin, dopamine, epinephrine and norepinephrine are significantly increased in depressed groups that perform this type of exercise. Likewise, Singh et al (2005) state that strength gains are associated with a reduction in depressive symptoms.

However, it has been shown that the combination of these two exercises, aerobic exercise and strength, promotes a greater reduction of symptoms of depressive disorder, so much so that Moraes et al. (2019), shows how aerobic and strength training with moderate intensity significantly reduces the symptoms of depressive disorder in older people. Similarly, Aron et al. (2020), propose new public health approaches to improve physical fitness through the combination of aerobic and resistance activities to reduce the incidence of common mental disorders such as depression and improve the physical health outcomes of people with these symptoms, because physical fitness could be an objectively measurable indicator and a modifiable risk factor in these people.

On the other hand, new intervention strategies have now emerged, such as high intensity interval training (HIIT), which has evolved as an effective intervention model, with a real impact on the health



status of the adult and even non-athlete population. This type of training was used at the beginning of the last century to train high-performance athletes but with the passage of time, after carrying out studies and adaptations, this methodology is used as a therapeutic tool for the population (Cofré-Bolados, 2016). In this sense, the study carried out by Pérez in 2020 shows a significant improvement in anxiety and a positive trend for depression in the groups that performed HIIT exercises.

For this reason, it is intended to carry out a program based on research that have implemented aerobic and strength exercise programs in people with depression and / or stress.

3. EXPLANATION OF THE ACTIVITY

Based on the selected literature, a possible exercise program for people with depression has been developed.

The project takes place twice a week, on Tuesdays from 6:00 p.m. to 7:30 p.m. and on Thursdays from 6:00 p.m. to 7:00 p.m. The total time of the project is 12 weeks, and can be carried out in institutions that have the appropriate material such as gyms. A limit of two absences per month cannot be exceeded. The exercise routine should be supervised by professionals.

TUESDAY

Warm-up exercise (5 minutes)

- 2 minutes of joint mobility
 - o Neck: lateral and forward-back rotation. 15 repetitions each.
 - o Shoulders: forward-back rotation. 15 repetitions each.
 - o Hips: 360º rotation. 15 repetitions in each direction.
 - o Knees: left / right rotation. 15 repetitions each way.
 - o Ankles: left / right rotation. 10 repetitions each way.
- 3 minutes of stretching:
 - o Arms: we cross the arm in front of the chest and press with the other hand. 15 seconds each arm.
 - o Shoulders: we raise the arm, holding the elbow flexing down. 15 seconds each arm.
 - o Calves: We place our hands on the wall / support and stretch the leg, supporting the tip of the foot. 15 seconds each leg.
 - o Quadriceps: Standing, bend one knee and gently stretch with the hand. 15 seconds each leg.
 - o Adductors: we sit down and look for the tip of the foot with our hand. 15 seconds each leg.



MOVILIDAD ARTICULAR 2MINUTOS



ESTIRAMIENTOS 3MINUTOS



Aerobic exercise (20 minutes)

- Running



Deceleration period (5 minutes)

- Slow down for 5 minutes for heart rate recovery.

Strength exercise (45 minutes)

- Three sets of 8-12 reps on each machine with 70% of maximum strength capacity:
 - the chest (chest press): 3x12



- back (low row): 3x12



- quadriceps (leg extension): 3x12



- ischium (leg flexion), using the machines: 3x12



Stretching and relaxation (10 minutes)

- Neck: We touch the chest with the chin and exert pressure on the nape with clasped hands.



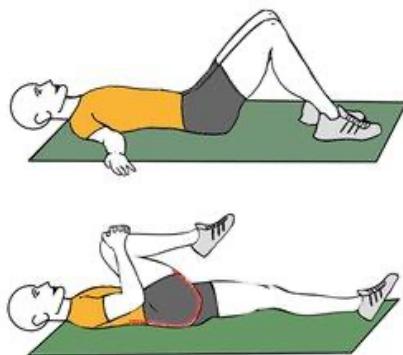
- Arm: with the trunk straight, pass one arm in front of the chest touching the opposite shoulder. Rest the other hand on the elbow and use force.



- Back: We sit on our knees, with our buttocks on our heels, stretching our arms as much as possible. After a few seconds we move our hands to the side while continuing to stretch them.



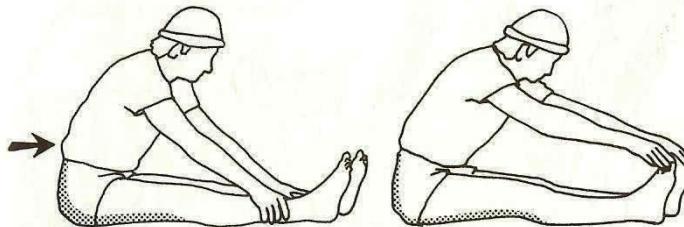
- Buttocks: face up, we bend our legs and take it by the knee, using force to bring the knee to the chest.



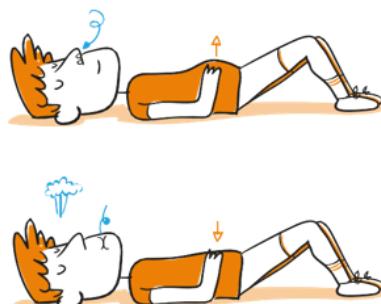
- Twin: we get up and pick up one leg, touching the tip of the other foot with our hands.



- Back: We stretch both legs and touch the tips of the feet.



- Abdominal breathing: Lying down, place your hands, one on your chest and one on your stomach. Inhale through your nose for a few seconds, noticing how the hand on your stomach goes up and the other doesn't. Hold for a few seconds, and exhale through your mouth gently until your abdominal muscles contract.



THURSDAY

Warm-up exercise (5 minutes)

- 2 minutes of joint mobility
 - o Neck: lateral and forward-back rotation. 15 repetitions each.



- Shoulders: forward-back rotation. 15 repetitions each.
- Hips: 360º rotation. 15 repetitions in each direction.
- Knees: left / right rotation. 15 repetitions each way.
- Ankles: left / right rotation. 10 repetitions each way.
- 3 minutes of stretching:
 - Arms: we cross the arm in front of the chest and press with the other hand. 15 seconds each arm.
 - Shoulders: we raise the arm, holding the elbow flexing down. 15 seconds each arm.
 - Calves: We place our hands on the wall / support and stretch the leg, supporting the tip of the foot. 15 seconds each leg.
 - Quadriceps: Standing, bend one knee and gently stretch with the hand. 15 seconds each leg.
 - Adductors: we sit down and look for the tip of the foot with our hand. 15 seconds each leg.

MOVILIDAD ARTICULAR 2MINUTOS Realizar movimientos amplios y completos.







cuello
Rotación lateral y adelante-atrás
15 repeticiones de cada uno

hombros
Rotación adelante-atrás
15 repeticiones de cada uno

caderas
Rotación 360º
15 repeticiones en cada dirección

rodillas
Rotación a izquierda/derecha
15 repeticiones en cada dirección

tobillos
Rotación a izquierda/derecha
10 repeticiones en cada dirección

ESTIRAMIENTOS 3MINUTOS Suaves antes de la actividad física y los repetiremos al final del entrenamiento.

brazos
Cruzamos el brazo por delante del pecho y presionamos con la otra mano.
15 segundos cada brazo.



gemelos
Apoyamos las manos en pared/soporte y estiramos la pierna, apoyando la punta del pie.
15 segundos cada pierna



cuádriceps
De pie, flexionamos una rodilla y estiramos suavemente con la mano.
15 segundos cada pierna



hombros
Levantamos el brazo, sujetando el codo flexionado hacia abajo.
15 segundos cada brazo.



aductores
Nos sentamos y tocamos la punta del pie con la mano.
15 segundos cada pierna



HIIT aerobic and strength exercise (24 minutes)

- High intensity sprint training: 7 sets of 20 seconds with high training intensity.
 - Material: exercise bike.
 - Duration of effort: 30 seconds with high intensity.
 - Micropauses: 30 seconds after each effort.
 - Macropause: 4 minutes. Every 4 repetitions a pause of more than 4 minutes to repeat the next series.
 - Reps: 4
 - Series: 3



Stretching and relaxation (10 minutes)

- Neck: We touch the chest with the chin and exert pressure on the nape with clasped hands.



- Arm: with the trunk straight, pass one arm in front of the chest touching the opposite shoulder. Rest the other hand on the elbow and use force.



- Back: We sit on our knees, with our buttocks on our heels, stretching our arms as much as possible. After a few seconds we move our hands to the side while continuing to stretch them.



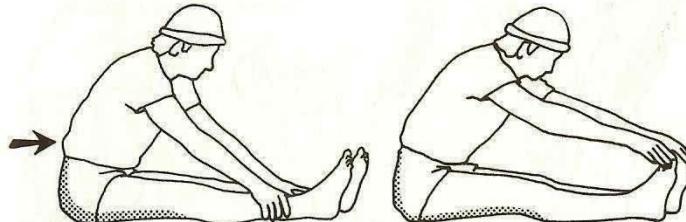
- Buttocks: face up, we bend our legs and take it by the knee, using force to bring the knee to the chest.



- Twin: we get up and pick up one leg, touching the tip of the other foot with our hands.



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- Abdominal breathing: Lying down, place your hands, one on your chest and one on your stomach. Inhale through your nose for a few seconds, noticing how the hand on your stomach goes up and the other doesn't. Hold for a few seconds, and exhale through your mouth gently until your abdominal muscles contract.





4. RESULTS

- A. Who are your identified stakeholders and / or (previous work).

People with depression and anxiety.

- B. How did you identify your stakeholders and / or multipliers (any sentence about the process)?

The most common disease in Spain was identified and studies began on the same topic.

- C. How did you establish a connection and collaboration with your stakeholders and / or multiplier? (Some phrase about the process)

Since we did not find collaboration from any of our participants, an evidence-based program has been developed.

- D. Expected intellectual results that are within the field of specialization of your organization:

Due to the intellectual study carried out, a reduction in anxiety or depression is expected in people suffering from clinical stress disorders or depression.

- E. How was the financing done and can I do it sustainably?

It is necessary to have adequate spaces and materials, for example, to be a member in institutions such as gyms.

- F. During the pilot test of these assets, what went well and what needs to be improved? (some sentence).

Good results are expected, that is, depression and anxiety levels decrease due to personal satisfaction and improvement in physical condition.

5. KEY CHALLENGES AND OPPORTUNITIES

Because it is evidence-based, the program goal is expected to be met when it can be implemented.

On the other hand, information is provided through social networks and physical activity is encouraged.

6. ADDITIONAL MATERIALS USED (leaflets, assessment materials...)

The following diptych will be distributed to the participants as a guide:



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7. BIBLIOGRAPHY



Bennie, JA, Teychenne, MJ, De Cocker, K., & Biddle, SJ (2019). Associations between aerobic and muscle-strengthening exercise with depressive symptom severity among 17,839 US adults. *Preventive medicine*, 121, 121-127.

Carneiro, L., Afonso, J., Ramirez-Campillo, R., Murawska-Ciąlowciz, E., Marques, A., & Clemente, FM (2020). The effects of exclusively resistance training-based supervised programs in people with depression: a systematic review and meta-analysis of randomized controlled trials. *International journal of environmental research and public health*, 17 (18), 6715.

Cofré-Bolados, C., Sánchez-Aguilera, P., Zafra-Santos, E., & Espinoza-Salinas, A. (2016). High intensity aerobic training: History and clinical physiology of exercise. *Magazine of the Industrial University of Santander. Health*, 48 (3), 275-284.

Kandola, AA, Osborn, DP, Stubbs, B., Choi, KW, & Hayes, JF (2020). Individual and combined associations between cardiorespiratory fitness and grip strength with common mental disorders: a prospective cohort study in the UK Biobank. *BMC medicine*, 18 (1), 1-11.

Kim, YS, O'Sullivan, DM, & Shin, SK (2019). Can 24 weeks strength training reduce feelings of depression and increase neurotransmitter in elderly females ?. *Experimental gerontology*, 115, 62-68.

Moraes, HS, Silveira, HS, Oliveira, NA, Portugal, EMM, Araújo, NB, Vasques, PE, ... & Deslandes, AC (2020). Is strength training as effective as aerobic training for depression in older adults? A randomized controlled trial. *Neuropsychobiology*, 79 (2), 141-149.

Pérez Busteros, I. (2020). HIIT as a treatment in the COPD patient: bibliographic review and treatment proposal.

Singh, NA; Stavrinos, TA; Scarbek, Y .; Galambos, G .; Liber, C .; Singh, MAF A randomized controlled trial of high versus low intensity weight training versus general practitioner care for clinical depression in older adults. *J. Gerontol. Ser. A Biol. Sci. Med Sci.* 2005, 60, 768–776.

Stubbs, B .; Rosenbaum, S .; Vancampfort, D .; Ward, PB; Schuch, FB Exercise improves cardiorespiratory fitness in people with depression: a meta-analysis of randomized controlled trials. *J. Affect. Disorder*. 2016, 190, 249-253.