

Aerobic Gymnastics and the physical condition in the university students

Abstract

The lifestyle of university students is characterized by a greater academic load, decreased physical activity and a lot of stress, this coupled with inappropriate eating behaviors and excessive use of technologies, encourages the development of sedentary habits that negatively influence the condition. physical, putting students at risk of suffering from chronic non-communicable diseases. The objective of this research was: to assess the effect of the implementation of an Aerobic Gymnastics exercise system to improve the physical condition of university students. This study was carried out at the Central University "Marta Abreu" de las Villas, with the participation of students from the Bachelor's Degree in Psychology. Methods were used at the theoretical level, such as analytical-synthetic, inductive-deductive, and system approach, and at the empirical level, document analysis, observation, survey, and measurement. In addition, the mathematical statistician for the analysis of all the quantitative information of the research. As a fundamental result, an aerobic exercise system was offered that positively influenced the physical condition of the university students being studied, facilitating their self-exercise for the development of physical capabilities, improving their physical and intellectual condition to better face challenges. of everyday life.

Keywords: *Aerobic Gymnastics, physical condition, university students*

Introduction

Numerous investigations affirm that the regular practice of physical exercise contributes to preserving and improving the health of those who do it, it also provides individuals with a healthy occupation of their free time and offers them the possibility of improving their physical condition to face the challenges of life. modern life.

University students are conditioned to changes in their lifestyles that have social, cultural and physiological repercussions. The university routine itself, characterized by stress, academic load, and lack of time for physical activity, makes university students susceptible to obesity (Vásquez et al., 2018). A large part of the student community does not perceive regular physical activity as a primary and necessary element for their health. Authors such as Rosa, García and Carrillo (2018) suggest that carrying out physical activity following certain parameters has a beneficial effect on the functions and structures of physical condition. These functions are: musculoskeletal, cardio-respiratory, hemato-circulatory, psycho-neurological and endocrine-metabolic, contributions that are assumed in this research.

It is necessary to resort to the contributions of authors such as Crespo, Armenteros and Puentes (2019); Yuing et al. (2021); Zapata et al. (2022); Chalapuc et al. (2023) who

report that the development of physical abilities plays an important role. They are present in all physical exercises, which constitute one of the most significant forms of human activity; where the physical and psychological characteristics of the personality are manifested and perfected, closely related, allowing them to successfully carry out certain types of activity.

Physical abilities are basic organic conditions for learning and perfecting physical-sports actions. These are divided into conditional, coordinative and mobility or flexibility. The contributions of Carrillo, Aguilar and González (2020) are significant, contextualizing in the university environment how to work on physical abilities taking into account the professional profile of each university degree.

In line with the above, it is important to recognize in this analysis of the physical condition in university students, the contributions of authors such as Caro et al. (2019); Costa et al. (2021) since everyone agrees with the importance of physical activity and its health benefits.

One of the activities for the development of physical condition that has become popular in recent times has been Aerobic Gymnastics. This is divided into two modalities: Aerobic Gymnastics for sports competition and Aerobic Gymnastics for all or indoor gymnastics. In the university context, sports Aerobic Gymnastics constitutes a sport that is the subject of study of the Physical Education discipline in the curriculum of the careers that are included in Plan E of higher education and is part of the pyramid of high university performance.

Other manifestations of Aerobic Gymnastics of great interest for the development of this research are training with Step, Tae-bo and Zumba. These trends are widely accepted for the benefits they bring to physical and mental health and physical condition.

However, even knowing the beneficial effects of practicing systematic physical activity for health and well-being, some people do not adopt active lifestyles. In this sense, students are vulnerable to developing sedentary habits during their time at university. The analysis of the results of the physical efficiency tests in the initial diagnosis and the observation of Physical Education classes allowed the authors of this research to detect that there is insufficient development of some of their abilities that affect the physical condition of the students. university students of the Bachelor's degree in Psychology, at the "Marta Abreu" de las Villas Central University.

The experience of previous courses shows that the majority of students arrive at the university with little knowledge about the correct development of physical activity, they

have limitations in the development of physical abilities and sports motor skills, even when they go through the entire system. educational, from preschool to 12th grade.

Another determining factor is the growing and constant evolution of information technologies that facilitate the conditions for students to be less and less active in the physical order. The fulfillment of obligations in the university context and the incorrect use of free time favor the development of sedentary habits.

Therefore, the following objective is proposed: to assess the effect of the implementation of an Aerobic Gymnastics exercise system to improve the physical condition of university students.

Methodology

The study was carried out at the “Marta Abreu” de las Villas Central University. The selected subjects were the first and second year students of the Bachelor's Degree in Psychology, Faculty of Social Sciences, academic year 2022-2023. We work with a population of 66 students, of which, they were selected by intentional non-probabilistic sampling 28 students of the first year of the degree, the intention of their selection responds to the fact that they are first-year students who are going to receive Physical Education as a subject of the degree curriculum in their first two years, which guarantees follow-up to delve deeper into the incidence of Aerobic Gymnastics on their physical condition, another criterion that was taken into account is that these students were the ones who presented the greatest deficiencies in physical condition in the diagnosis made. The sample is characterized by 25 female students for 89% and three male students for 11%. The average age is 18 years, they have received Physical Education in general education, two are cadets inserted into the Revolutionary Armed Forces and all of them did not practice sports for competitive purposes.

A descriptive transactional design was carried out assuming a dialectical-materialist conception as a scientific method, which allowed the object of study to be approached with historicity, flexibility and a systemic character. Therefore, a system of methods shown below was selected. From the theoretical level

Analytical-synthetic: it was used to substantiate the problem, develop instruments, analyze results, prepare the final report and unify the data.

Inductive-deductive: it was used to focus the proposed system of exercises based on the analysis of the results obtained in the study carried out, as well as to reach conclusions regarding its possible application and generalization.

Functional structural systemic: expresses the logic or succession of procedures followed by the researcher in the construction of knowledge in accordance with the general theory of systems, for the development of the Aerobic Gymnastics exercise system to improve the physical condition in the studied subjects.

From the empirical level

Document analysis: it was used to review documents, verify the objectives and contents with potential for the treatment of physical condition related to health. Documents such as the Physical Education Program Plan E, Professional Model of the Psychology career.

Observation: 10 Physical Education classes were observed in higher education with the objective of diagnosing the needs and potential of the students.

Survey: it was applied to 1st year students of the Bachelor's Degree in Psychology at the "Marta Abreu" Central University of Las Villas to diagnose theoretical and practical knowledge about physical fitness, Aerobic Gymnastics, physical activity and health, as well as to evaluate the effectiveness of the designed exercise system.

Interview: it was carried out with teachers with experience in Physical Education and Aerobic Gymnastics specialists from the Marta Abreu de las Villas Central University, to complement the information related to the field of action of the research and take into account criteria and suggestions.

Measurement: to obtain and evaluate the results of the evaluated indicators of physical condition and determine the level of physical activity based on heart rate.

Of the statistical and/or mathematical processing methods, the percentage calculation was used, as a procedure, for the analysis of all the quantitative information of the research, in the diagnosis and in the evaluation of the proposed exercise system.

Descriptive statistics were used in the preparation of bar graphs that allowed representing the results achieved before and after applying the proposed exercise system.

The study was divided into three phases. During the initial diagnostic phase, body weight (Kg) and height (cm) were measured to determine the Body Mass Index (BMI), which was calculated by the formula: $BMI = \text{Weight}/\text{Height}^2$. The physical efficiency tests established for higher education were applied (planks, sit-ups, speed, resistance and long jump without an impulse race). To evaluate physical condition, a battery of physical tests was used to quickly and practically assess, strength endurance in the thighs (quadriceps), flexibility, cardiorespiratory fitness, and physical activity level.

Strength resistance in the quadriceps: by applying the one-minute static squat test, the strength resistance of the quadriceps is evaluated.

Procedure: the subject stands with his back against the wall, separates his feet twice as wide as his hips and maintains the squat position with ninety-degree flexion, keeping his arms extended in front without any type of support.

Classification: if the subject manages to maintain the static squat position for one minute, the score is given as acceptable; On the contrary, if the individual does not complete the required time, he is classified with the score of needing to improve muscle strength in the quadriceps.

Flexibility: it is evaluated through the use of the Wells Test (adapted).

Procedure: the subject is placed in a sitting position, with knees in full extension. With hands together, placing the palm of one hand on the back of the opposite hand; The subject must flex the spine forward, on a base 20 centimeters long as far as possible, bringing the arms in the direction of the feet, keeping the knee in full extension.

Classification: if the subject passes more than 10 centimeters from the tip of his or her feet, he or she will have an outstanding score; If the subject reaches a range between one and 10 centimeters in front of his feet, it will be scored as acceptable; If, on the other hand, the subject cannot touch the tips of their feet and the distance is from one centimeter to minus 10 centimeters, they will be classified as needing improvement.

One-Minute Static Walk: Cardiorespiratory fitness is quantified with the one-minute static walk test.

Procedure: the subject must perform the greatest number of knee raises in one minute at ninety degrees simulating the walking movement, keeping the back straight (the right knee raise and the left knee raise is equivalent to one cycle)

Rating: The score ranks the test as follows: 60+ cycles – Very Outstanding, 50-59 cycles – Outstanding 40-49 cycles – Acceptable, 30-39 cycles – Needs Improvement.

Level of physical activity: to determine the level of physical activity, specific questions are applied that provide specific information about the practice of physical activity. It was decided to determine the levels of physical activity in a more objective way, according to the step test or Test of physical activity. Pérez – Rojas – García Sedentary Life Classification (modified) on the behavior of heart rate. This test classifies the person as severely sedentary, moderately sedentary or active, or very active.

Intervention phase or implementation of the solution proposal: after developing the proposal for the Aerobic Gymnastics exercise system to improve the physical condition of university students, it is implemented during the months of February 2022 to July 2022. Taking into account when teaching the basic steps of Aerobic Gymnastics, Step,

Tae-bo and Zumba to start from the simplest to the most complex, with a gradual increase in the loads and intensity of the work.

Evaluation phase: the instruments used in the initial diagnostic phase were applied to verify the effectiveness of the proposed exercise system. The statistical processing of the data was carried out using descriptive measures for quantitative data, in this case, the arithmetic mean and the empirical frequency distribution.

Results and discussion

Physical activity is considered one of the essential components for the development and maintenance of health in people. Regardless of age, being physically active improves quality of life and provides both physical and mental well-being (Giroir and Wright, 2018).

Based on this criterion, a survey was carried out to determine the level of physical activity of the students (frequency, duration and intensity) and to identify if they have knowledge about Aerobic Gymnastics from a theoretical-practical point of view.

Regarding the practice of physical activity, the majority of students, 23 (82%), perform physical exercises only in Physical Education classes, twice a week. Only five (18%) practice physical activity systematically. Which showed a predominance of sedentary habits in the group, since only two (females) do vigorous physical activity, five times a week for more than 30 minutes while the rest three (men) do moderate intensity exercises, three times a week. 10 to 30 minutes long.

Respondents stated that they do not have time due to study, teaching tasks and university life; responses that coincide with the results provided by Jañez et al. (2022) that university students spend much of their time sitting and dedicate more hours to studies, possibly becoming more sedentary.

In relation to knowledge about Aerobic Gymnastics, the survey reflected that 100% of respondents know some elements that they have heard about this sport, but only three have a minimum level of practical experience from previous degrees.

Regarding the Sedentary Test, 22 students were classified as severely sedentary because at the end of the first load they had more than 120 b/min, three were classified as Moderate Sedentary and only three were classified as Active carrying out the 3 workloads, which corroborates the predominance of sedentary habits in the group.

The relationship between height and weight with the Body Mass Index (BMI) showed that eight students are overweight, four are evaluated as underweight and 16 have normal

weight, which does not mean that they are exempt from suffering changes in their body weight due to the characteristics of university life. In this sense, the lack of physical activity and the acquisition of an unhealthy diet are two clear risk components for developing cardiovascular diseases, being one of the main public health problems of the 21st century.

Regarding the result of the evaluation of the physical condition indicators, the initial diagnosis reflected that the students have deficiencies. The average values show a predominance of the evaluation needs improvement in the tests that measure flexibility, cardiorespiratory fitness and strength resistance as seen in Figure 1.

In relation to physical abilities, the most affected according to the results obtained is resistance. Males have better development of physical capacity, strength, compared to females. While 36% of females have a better level of flexibility. Which made it possible to confirm the need to apply the Aerobic Gymnastics exercise system to improve the components of physical condition.

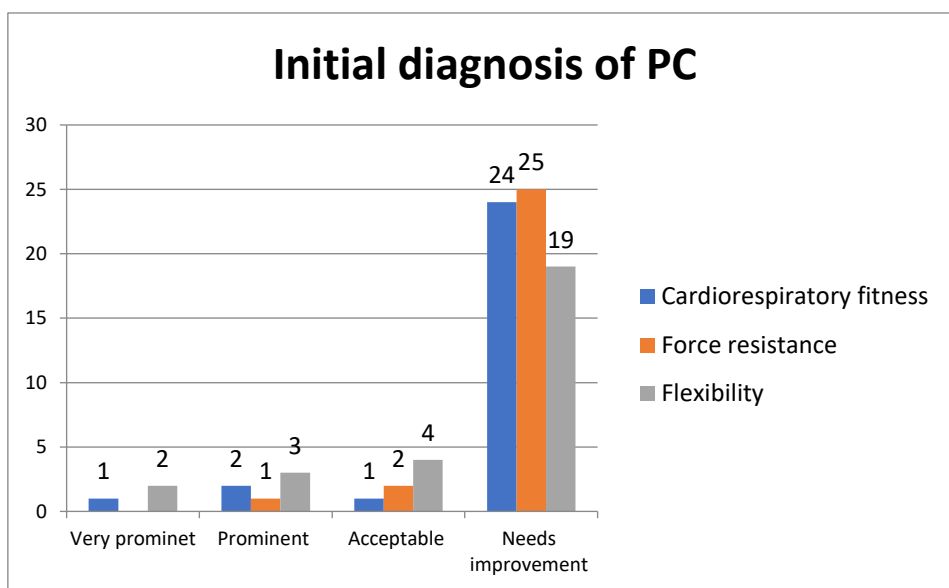


Figure 1. CF indicators evaluated before the implementation of the Aerobic Gymnastics exercise system

The construction of the Aerobic Gymnastics exercise system proposed to improve the physical condition of the students under study, initially went through a bibliographic search about Aerobic Gymnastics and its variants: training with Step, Tae-bo and Zumba since they share Yes, similar characteristics, although each one has its particularities that distinguish them from the others. The authors assume the considerations for Tae-bo work according to Milenkovic et al. (2023).

To design the choreographies, basic steps from low- and high-impact Aerobic Gymnastics and their combinations were used, alternating with Step, Tae-bo and Zumba training. The style for teaching-learning the steps used was direct command. There are two work strategies for teaching movements, these are free form and addition. Both were used in this proposal depending on the needs of the group.

This proposal for aerobic exercises aims to:

- Familiarize students with the practice of Aerobic Gymnastics for self-exercise
- Improve the physical condition of 1st year Psychology students.
- Develop physical capabilities through the Aerobic Gymnastics exercise system

Its implementation is divided into three stages:

1st stage: familiarization with the aerobic exercise technique.

2nd stage: improvement of physical condition.

3rd stage: maintenance of physical condition.

The Aerobic Gymnastics exercise system is composed of:

1. Warm-up exercises
2. Aerobic endurance work
3. Localized gymnastics
4. Breathing exercises
5. Exercises for muscle relaxation.

Through modeling, a theoretical, methodological and practical representation of the conception that supports the structural organization of the exercise system was made, based on the functional structural systemic method: the logic of the procedures is followed in the construction of the exercise system in consequence with the general theory of systems. Just as the components that make it up are selected. Figure 2 shows a schematic view of the proposed exercise system.

Schematic View of the exercises system

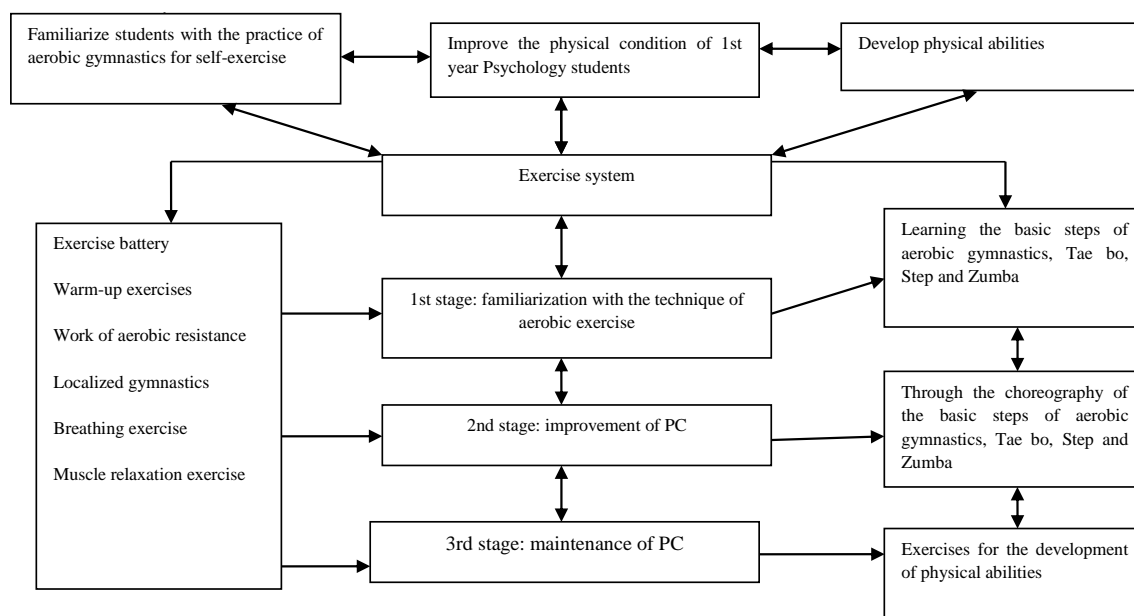


Figure 2. Schematic view of the Aerobic Gymnastics exercise system to improve the physical condition of 1st year Psychology students.

With the application of this system of exercises, it was observed that after the familiarization stage, the students demonstrated mastery of the aerobic content, great interest and enjoyment of the class, they felt motivated and expressed a positive attitude towards the practice of Aerobic Gymnastics. An increase in the average values of the evaluation is evident, very notable, notable and acceptable in the cardiorespiratory fitness and flexibility indicators with respect to the initial values, Figure 3. The levels of development of the aerobic resistance, coordination, rhythm and flexibility.

The students activated creativity in the construction of their choreographies, showing themselves to be more independent and active from a physical point of view. The level of physical activity increased, resulting in five very active students, 15 active, 10 moderately sedentary and only four severely sedentary. This shows that the students perceived the importance of the systematic practice of Aerobic Gymnastics during their leisure time for their well-being.

Diagnosis of PC after the intervention

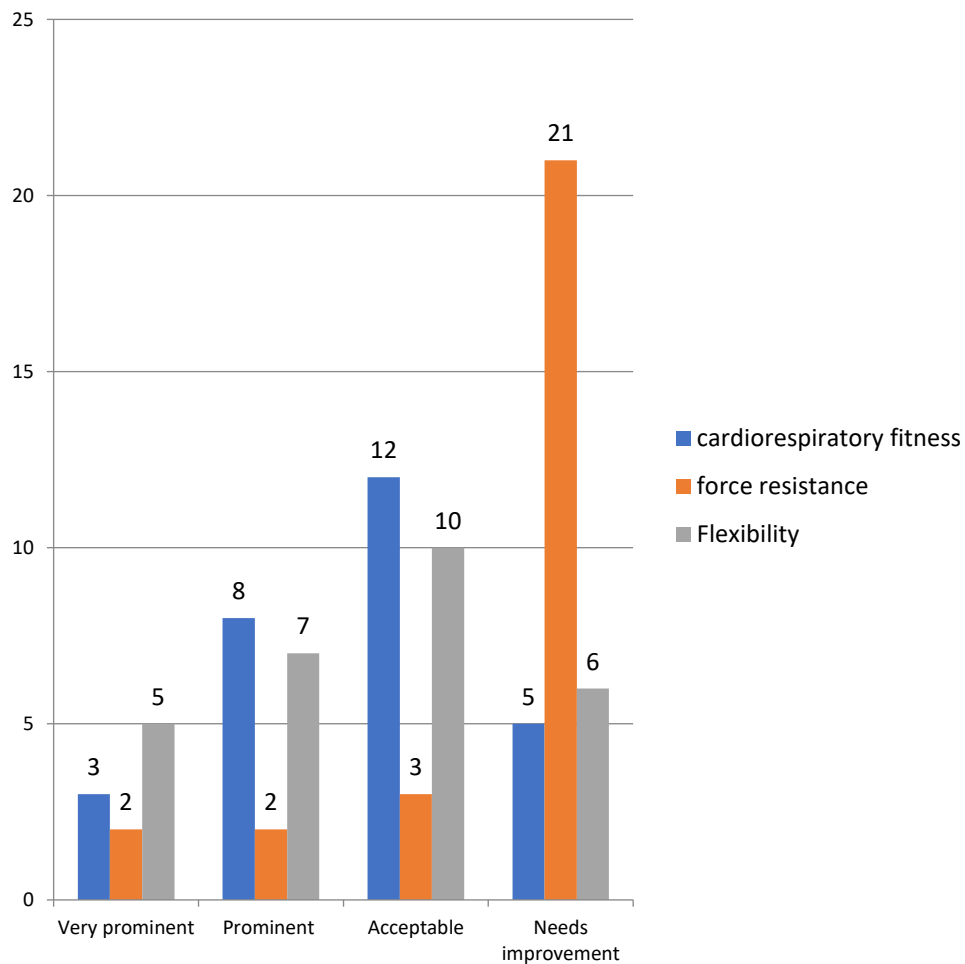


Figure 3. Physical condition indicators evaluated after the implementation of the Aerobic Gymnastics exercise system

Table 1 shows the behavior of the physical condition indicators evaluated before and after the implementation of the proposed exercise system. There is an increase in the number of students evaluated as very outstanding, outstanding and acceptable in the cardiorespiratory fitness and flexibility tests, as well as a significant decrease in students who need to improve these indicators.

Table 1. Comparison of physical condition indicators evaluated before and after the implementation of the proposed exercise system.

Indicators	Very outstanding		outstanding		Acceptable		needs improvement	
	1ra	2da	1ra	2da	1ra	2da	1ra	2da
Measurements								
cardiorespiratory fitness	1	3	2	8	1	12	24	5
Resistance Strength	0	2	1	2	2	3	25	21
Flexibility	2	5	3	7	4	10	19	6

As can be seen, the strength resistance indicator shows that there are still 21 students evaluated with the Needs Improvement category, which is why the work on said indicator must continue to be reinforced.

Conclusions

- The use of Aerobic Gymnastics in Physical Education classes twice a week gives students the possibility of learning how to carry out this activity so that they can practice it themselves at home or in their leisure time, promoting habits healthy, as well as optimal development of physical capabilities, improving their physical and intellectual condition to better face the challenges of daily life.

- The application of the aerobic exercise system had a positive influence on the physical condition of university students. The values of the cardiorespiratory fitness, flexibility and strength indicators improved compared to the initial diagnosis. The number of students evaluated in the categories of very outstanding, outstanding and acceptable increased, as well as the level of physical activity, showing more active students who assimilate a greater workload with less alteration of the pulse, which corroborates that the systematic practice of physical activity is beneficial for health.

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