PODIUM

Journal of Science and Technology in Physical Culture

Volume 20
Issue 2
2025

University of Pinar del Río “Hermanos Saíz Montes de Oca”

ISSN: 1996–2452 RNPS: 2148
PODIUM Journal, May-August 2025; 20(2): e1490

PODIUM
REVISTA DE CIENCIA Y TECNOLOGÍA EN LA CULTURA FÍSICA

Original article

Evaluation of physical fitness in adults from 41 to 65 years of age

Evaluación del estado de la condición física, en personas adultas de 41 a 65 años de edad

Avaliação da aptidão física em adultos de 41 a 65 anos

Idaris Gómez Ravelo[1*], *Héctor Rafael de las Cuevas Milán*[1*], *Mayra Vila Machado*[2*]

[1*]Universidad Agraria de la Habana, Cuba

[2*]Instituto Nacional de Deportes, Educación Física y Recreación, Cuba

Corresponding author: idaris@nauta.cu

Received: *19/02/2023*
Approved: *26/06/2025*

ABSTRACT

Physical assessment is considered a multidimensional and interdisciplinary diagnostic process that quantifies a person's medical, psychological, social, and functional capacities and problems, with the aim of improving their quality of life. Consequently, the research focused on evaluating the physical condition of the population aged 41 to 65 at the Guayabal University Farm. The sample was composed of 32.14% males and 67.86% females, measurements of weight, height, neck, waist for both sexes were made, and also hips for

females at these ages, and with the help of the automated system, the body mass index, waist-height ratio and body fat percentage were determined. As results, it was revealed that for the three indicators evaluated there was 44.64% overweight and obesity, where women had a greater tendency to obesity, and the association of the three indicators was significant, with an average value of 0.69, which allowed to affirm that there were obesity values. It was concluded that evaluating the level of physical condition of the population was of great importance, with a view to the development of a personalized physical preparation program, to improve the quality of life of people with overweight and obesity indicators.

Keywords: body composition, body mass index, waist-to-height ratio, fat percentage

RESUMEN

Se parte de considerar la evaluación física como un proceso de diagnóstico multidimensional e interdisciplinario que cuantifica las capacidades y problemas médicos, psicológicos, sociales y funcionales de la persona, con la intención de mejorar su calidad de vida. En consecuencia, la investigación se centró en evaluar el estado de condición física, de la población de 41 a 65 años de edad, en la Granja Universitaria Guayabal. La muestra estuvo compuesta por un 32,14 % del sexo masculino y 67,86 % del femenino, se realizó la medición del peso, talla, cuello, cintura para ambos sexos, y además las caderas para el sexo femenino en estas edades, y con ayuda del sistema automatizado, se determinó el índice de masa corporal, relación cintura altura y porciento de grasa corporal. Como resultados, se reveló que para los tres indicadores evaluados existió un 44,64 % de sobrepeso y obesidad, donde las mujeres tuvieron mayor tendencia a la obesidad, y la asociación de los tres indicadores fue significativa, con un valor medio de 0,69 lo que permitió afirmar que hubo valores de obesidad. Se concluyó que evaluar el nivel de condición física de la población fue de gran importancia, con vistas al desarrollo de un programa de preparación física personalizado, para mejorar la calidad de vida de las personas con indicadores de sobrepeso y obesidad.

Palabras clave: composición corporal, índice de masa corporal, relación cintura-altura, porcentaje de grasa

RESUMO

A avaliação física é considerada um processo diagnóstico multidimensional e interdisciplinar que quantifica as capacidades e os problemas médicos, psicológicos, sociais e funcionais de uma pessoa, com o objetivo de melhorar sua qualidade de vida. Consequentemente, a pesquisa se concentrou em avaliar a aptidão física da população de 41 a 65 anos da Fazenda Universitária Guayabal. A amostra foi composta por 32,14% de homens e 67,86% de mulheres. Peso, altura, circunferência do pescoço e circunferência da cintura foram medidos para ambos os sexos, assim como circunferências do quadril para mulheres dessas idades. Utilizando um sistema automatizado, foram determinados o índice de massa corporal, a relação cintura-estatura e o percentual de gordura corporal. Os resultados revelaram que, para os três indicadores avaliados, 44,64% apresentavam sobrepeso e obesidade, sendo as mulheres com maior tendência à obesidade. A associação entre os três indicadores foi significativa, com valor médio de 0,69, indicando a presença de obesidade. Concluiu-se que avaliar o nível de aptidão física da população é de grande importância para o desenvolvimento de um programa de treinamento físico personalizado, visando à melhoria da qualidade de vida de pessoas com sobrepeso e obesidade.

Palavras-chave: composição corporal, índice de massa corporal, relação cintura-estatura, percentual de gordura corporal

INTRODUCTION

There is now abundant evidence to demonstrate that regular practice of moderate physical and sports activities are lifestyle habits that have a direct impact on improving and maintaining health. Numerous scientific studies have suggested that physical fitness is a powerful indicator (and predictor) of health status from childhood and adolescence, associated with physical activity and nutrition (Quiala et al., 2021).

Physical evaluation is a multidimensional and interdisciplinary diagnostic process that quantifies a person's medical, psychological, social, and functional capacities and problems,

with the aim of improving quality of life. This diverse range of needs makes physical fitness evaluation a key factor, both for the information it conveys and for its applicability. It also allows for immediate identification of problems and needs and the planning of action strategies that allow for individualizing the process.

For this reason, the evaluation of physical condition is a subject of research by different authors at an international level; from the last five years, it can be mentioned those developed by Benavides *et al.,* (2017); Farinola (2020); González and Ramírez (2017); Quiala, Chang and Pons (2019 and 2020); La Rosa (2017); Secchi, García and Arcuri (2016) which, as a common characteristic, seek to adjust the way of evaluating personnel and the environment.

Authors such as Quiala et al. (2021) propose that the body mass index (BMI, kg/m ^{2}), the waist-height ratio (Wh /H), and body fat percentage (% Fat) are valid indicators for assessing physical condition in ordinary populations, as they are parameters for assessing obesity levels in the adult population, allowing comparisons of its evolution in large populations, and providing useful statistical information on the prevalence of obesity.

Physical fitness level can be considered the capacity to perform physical activity and/or exercise, and its assessment constitutes a measure that describes the integrated state of the main organic functions involved in bodily movement. Several studies suggest that physical fitness level is a predictor of morbidity and mortality from cardiovascular disease, independently of a person's health status; this is a determining factor in longevity and health-related quality of life.

Available scientific evidence indicates an alarming decline in fitness levels across different ages; recent research suggests that a low fitness level is one of the factors directly associated with overweight and obesity.

Obesity is strongly linked to various physiological and psychosocial disorders, as well as its impact on health, well-being, and quality of life. Therefore, evaluating individuals who are overweight or obese and observing their relationship with their physical fitness level can be

important for preventing medium- or long-term health problems. This association is much more robust when physical fitness level is related to the potential risk of cardiovascular disease, both in healthy individuals and in patients with underlying cardiovascular disease (Mora et al., 2003).

For older adults, the ideal is to develop physical activity to improve cardiorespiratory and muscular function (Hurst *et al.* 2019) and to help prevent or delay cognitive decline (Mera, *et al.,* 2018; Mercedes, *et al.,* 2017) among others.

In the work of La Rosa et al. (2022), it is addressed that for older adults, physical activities should consist of recreational activities that combine everyday actions with low-impact exercises, a position that coincides with Alarcón and Abensur (2020); as a result, certain routines should be modified by varying sports such as volleyball and soccer, based on real possibilities, given that adequate physical conditioning can ensure a good quality of life at this stage (La Rosa, *et al.,* 2022).

Vaca and Cedeño (2022) point out that physical activity decreases in the older adult population as the years go by, and non-communicable diseases increase. This is defined as a problem influenced by several causes; for example, in the case of women, those related to physical inactivity, given that they have to divide their time between household chores, caring for the family, and because they do not like it or are not motivated to do it.

In the case of men, the causes include fear of injury, lack of motivation from their peers, illness, disinterest, the perception of feeling overwhelmed by not being able to exercise at the same pace as others, and lack of family support; all of which predispose them to not engaging in physical activity and incurring a sedentary lifestyle (Vaca and Cedeño, 2022).

The research took as its starting point the problematic situation, given the absence of the physical condition of the population aged 41 to 65 at the Guayabal University Farm in San José de las Lajas, with a view to improving the process of optimizing health opportunities through the application of personalized physical preparation programs for this population group.

In correspondence, the objective of this work was to evaluate the physical condition of the population aged 41 to 65 years at the Guayabal University Farm. This work was carried out with the aim of developing a personalized sports and physical activity program to improve the quality of life of the population.

MATERIALS AND METHODS

Methods used:

- Analytical-synthetic: It was used to establish logical connections for argumentation and reaching conclusions, in the evaluation of the physical condition of the population at the Guayabal Farm.
- Inductive deductive: it was carried out, through the support of information technology, specifically, through the automated physical condition evaluation system, with which the calculations of the BMI, the Waist/Height ratio, and the % Fat were made.
- Mathematical statistics: descriptive statistical analysis for the interpretation, assessment, and comparison of the study, as well as the development of equations for the behavior of physical fitness indicators for different age groups.
- Measurement: in order to obtain results from the physical fitness evaluation of the analyzed sample, through the application of physical tests, weight (kg), height (m), neck circumference (cm), waist circumference (cm), and hip circumference (cm) were measured for females.
- Scientific observation: in the analysis of the physical condition indicators evaluated.

The physical fitness evaluation of the Guayabal University Farm population was conducted among the ages of 41 to 65 (average 57 years), for both sexes. The sample comprised 41.18% of the center's total population, with 32.14% being male and 67.86% being female.

Results & Discussion

In Table 1, a descriptive summary of the results of the measurements of weight (kg), height (m), neck (cm), waist (cm) and hip for the female sex (cm) was presented.

Table 1. *Average values of the indicators.*

	Age	**Weight, kg**	**Size, m**	**Neck, cm**	**Waist, cm**	**Hip for women, cm**
Average	52.15	66.77	1.61	34.95	90.75	103.66
Mean deviation	6.41	15.15	0.09	3.59	13.08	12.05

From the measurements taken and with the help of the automated ECF system (Gómez et al, 2022), developed by professors from the Faculty of Physical Culture and the Center for Agricultural Mechanization of the Agrarian University of Havana, the processing of the primary data was carried out, from which the BMI, kg/m ^{2}, Waist /Height and % Fat were determined.

The BMI is also called BMI in reference to its acronym in English (Body Mass Index), was extracted from the relationship between body weight expressed in kg and height taken in m ^{2}, presented below according to the guidelines established based on age and gender. The BMI, at these ages (41 to 65 years), for both sexes was 46.43% for a normal index, 17.86% for overweight people, 28.57% for obesity and 7.14% for underweight.

The behavior by sex of the BMI showed that the male sex had no people with underweight, 17.86% with normal index, and 10.71; 3.57% for overweight and obesity, respectively. In the female category, 7.14% were underweight and overweight, with 28.57% being normal weight and 25% being obese. It was also observed that males had lower percentages of overweight and obesity (14.28%) compared to women with 32.14%. A similar result was obtained by Araya et al. (2012) who evaluated women over 60 years of age, with an average overweight rate of 28.96%.

ISSN: 1996–2452 RNPS: 2148
PODIUM Journal, May-August 2025; 20(2): e1490

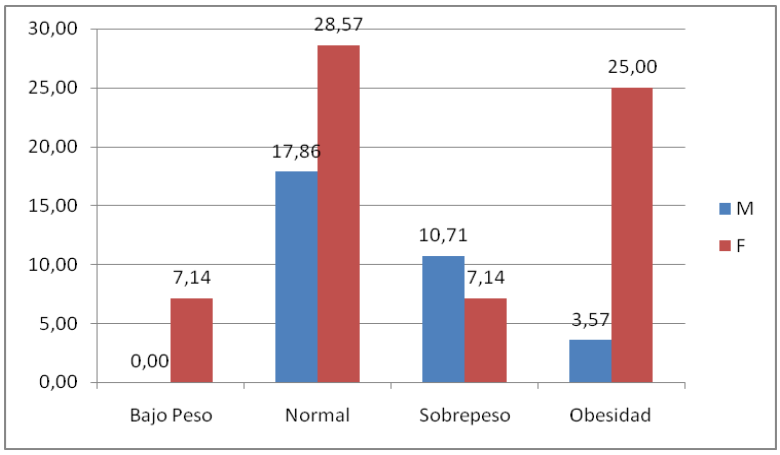

Figure 1. *Behavior of BMI (%), by sex*

Figure 2 shows the evolution of BMI with age. It was observed that between the ages of 41 and 45, it was low for both sexes. For ages between 46 and 50, women had a normal BMI, while men were unrepresented; from 51 to 55 years, women were overweight and men were obese; from 56 to 60 years, the BMI was normal for both sexes, returning to overweight in both cases between the ages of 61 and 65. Figure 2 represents the trend with increasing age from 41 to 65 years, from a normal BMI to overweight.

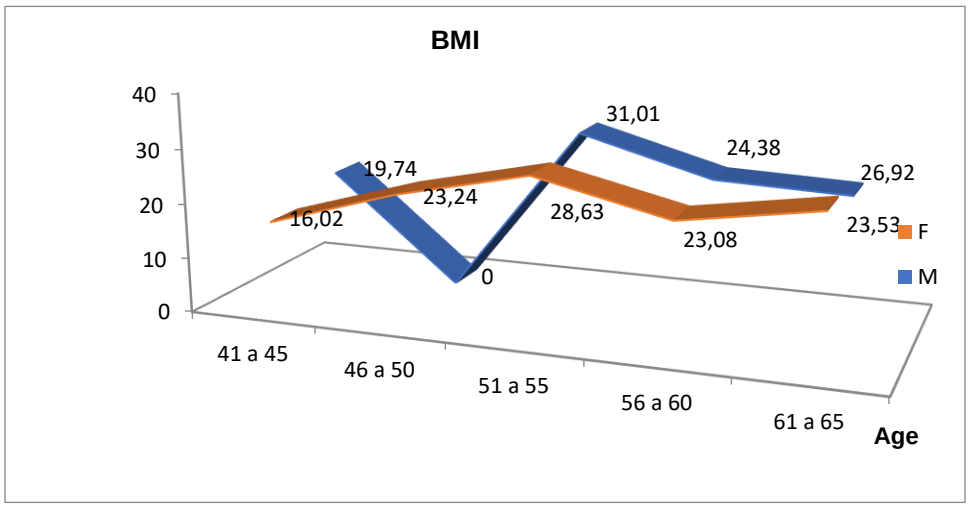

Figure 2. *Behavior of BMI for different age groups*

In the case of the Waist /Height ratio, the overall evaluation, regardless of sex, was characterized by 25% normal and 75% overweight. Among males, 32.14% of individuals were overweight, and 42.86% among females. In the normal category, 25% of those assessed met this condition. The results of this indicator showed that in the ages evaluated (41 to 65 years), the majority of individuals were obese. Figure 3 shows the Waist /Height ratio values for five age categories between 41 and 65 years for the population at the Guayabal University Farm.

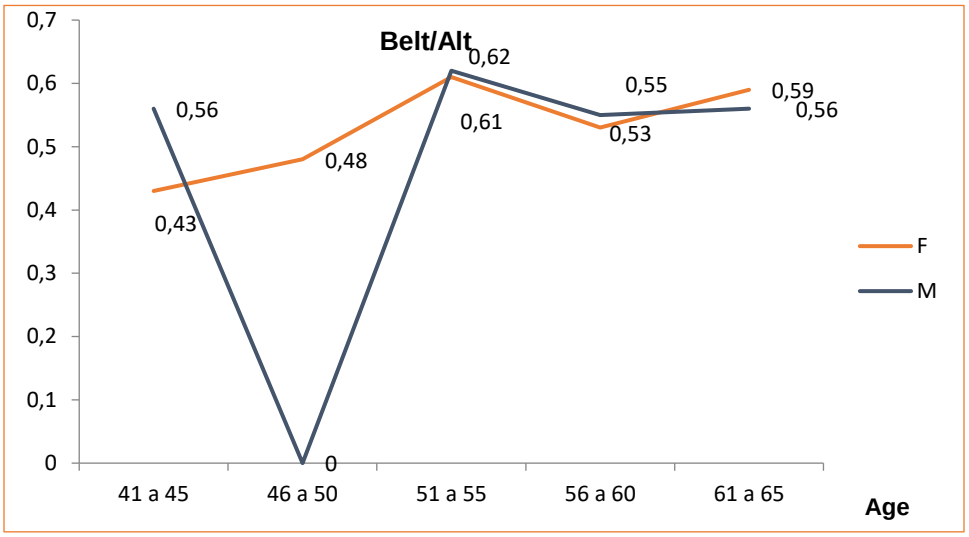

Figure 3. *Waist /Height ratio for different age groups*

The Waist /Height ratio initially showed a normal level for women between the ages of 41 and 50, then shifted to adiposity at ages over 51. This trend did not occur for men, who between the ages of 41 and 65 presented adipose characteristics.

The % Fat indicator, regardless of sex, identified that 39.29% were within the normal range, 57.14% were obese, and 3.57% were in the fitness category. The behavior by sex is shown in Figure 4, where it was estimated that within the acceptable range, values were obtained of 14.29% and 25% for males and females, respectively; the percentage of obese was 17.86%

and 39.29% for men and women in that order, and in the Fitness category, females presented 3.57% within this condition.

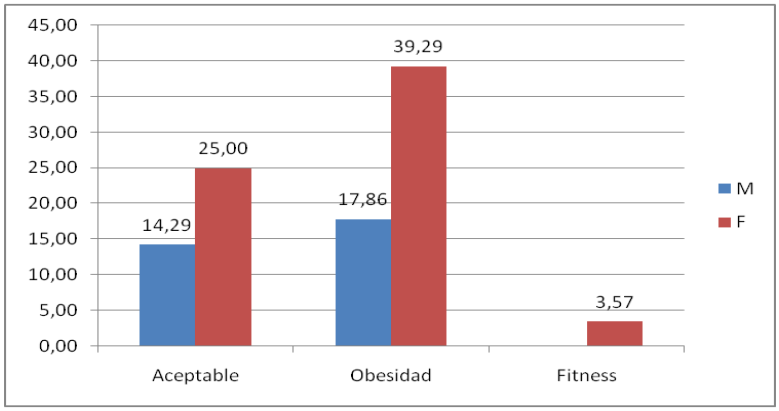

Figure 4. *Fat percentage behavior, according to sex*

In Figure 5, the behavior of % Fat as a function of age was observed, for five age categories between 41 and 65 years, where for both sexes from 41 to 45 years there was an acceptable behavior; from 46 years in women there was a tendency towards obesity, and in the case of men in the range of 51 to 55 there was a % Fat with obesity values, this behavior did not occur from 56 to 65 years, where the values were acceptable.

It was shown that the BMI, Waist /Height and % Fat indicators, in the ages between 41 and 65 years in the Guayabal University Farm, were characterized by a tendency towards obesity, with a greater predominance in the case of women.

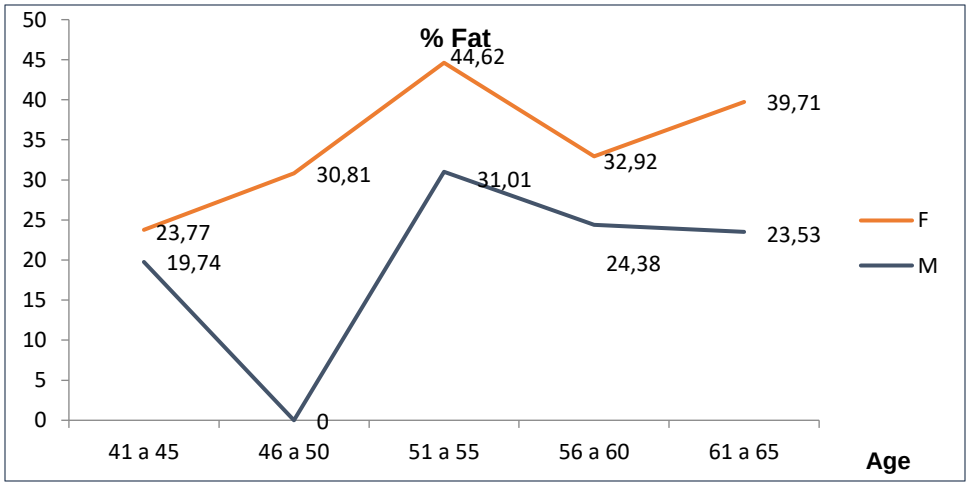

Figure 5. *Fat percentage behavior, according to age*

The above was verified by determining the association between the indicators evaluated for the sample of 41 to 65 years of age in both sexes. The correlation between BMI, Waist /Height, and % Fat was significant, with values of 0.82 between the first and second indicators; 0.63 between the first and third; and 0.63 between the second and third.

Unlike the observation method used in this study to measure physical fitness, other works stand out where the vision, methods, and procedures are different; however, in terms of feedback, these studies were consulted and contrasted, not only from the perspective of comparison but also from the perspective of learning and professional growth in the field.

Among these works, Solis et al. (2019) stood out, who used a previously calibrated scale with a precision of 0.1 kg (Tanita ® Japan, model HD-313), where height was measured with a portable stadiometer (Seca ® Germany, model 216); the objective was to determine the nutritional status, according to the recommendations of the World Health Organization, through the BMI Z-score obtained by the WHO AnthroPlus ® software, and the results obtained provided very valuable information for said organization.

Gatica's (2019) research had a similar scope, focusing specifically on children, in accordance with global standards for measuring physical fitness. At slightly older ages, such as those corresponding to adolescence, the work of Delgado et al. (2019) was considered significantly relevant, as they linked nutrition and academic performance in their study. In the case of older adults, the work of Martínez et al. (2021) was taken as a reference, who analyzed the strong influence of self-esteem at these ages and the performance of exercises to improve physical condition at this stage of life and reduce anxiety and depression levels.

CONCLUSIONS

The study evaluated the lifestyle of the 41- to 65-year-old population of Guayabal, with a greater emphasis on those aged 51 to 65. The results regarding the physical fitness level of

the Guayabal University Farm population were of great importance, with a view to developing a personalized physical preparation program to improve the quality of life of people with overweight and obesity indicators, through gentle aerobic exercises, dance therapy, and other low-impact activities, always under the supervision of Physical Culture professionals.

REFERENCES

Alarcón, R., &Abensur, C. (2020). Actividad física subaeróbica de bajo impacto: una estrategia para disminuir el deterioro del sistema muscular y mejorar la calidad de vida en personas de la tercera edad, en los (cpr) distrito de Pachacamac. Ciencia y Desarrollo, 23(2), 43-50. https://doi.org/10.21503/cyd.v23i2.2090

Araya, S., Padial, P., Feriche, B., Gálvez, A., Pereira, J. y Mariscal, M. (2012). Incidencia de un programa de actividad física sobre los parámetros antropométricos y la condición física en mujeres mayores de 60 años. Nutrición Hospitalaria, 27(5):1472-1479.

Benavides, C., García, J., Fernández, J., Rodrígues, D., & John, A. (2017). Condición física, nivel de actividad física y capacidad funcional en el adulto mayor: instrumentos para su cuantificación. U.D.C.A Actualidad & Divulgación científica, 20(2), 255-265. https://doi.org/10.31910/rudca.v20.n2.2017.385

Delgado-Floody, P., Caamaño-Navarrete, F., Jerez-Mayorga, D., & Cofré-Lizama, A. (2019). Calidad de vida, autoestima, condición física y estado nutricional en adolescentes y su relación con el rendimiento académico. Arch Latinoam Nutr, 69, 174-81.

Farinola, M. G. (2020). Propuesta de evaluación de la condición física para población general: Batería Dickens. Educación Física y Ciencia, 22(1), e114. https://www.efyc.fahce.unlp.edu.ar/article/download /EFyCe114/12236?inline=1

Gatica-Domínguez, G., Moreno-Saracho, J. E., Cortés, J. D., Henao-Moran, S. A., & Rivera, J. A. (2019). Condición física de escolares tras intervención educativa para prevenir obesidad infantil en Morelos, México. *salud pública de méxico*, *61*(1), 78-85.

Gómez, I, de las Cuevas, H. Fernández de Castro, A, Morejón, Y. (2022). Sistema automatizado para la evaluación de las condiciones físicas.

González Rico, R., & Ramírez Lechuga, J. (2017). Revisión de las pruebas de evaluación de la condición física en Educación Secundaria. Ágora para la educación física y el deporte, 19(2-3), 355-378. https://dialnet.unirioja.es/servlet/articulo?codigo=6261767

La Rosa Arias, M., Zaldívar Castellanos, L. A., Martínez González, O., & Gordo Gómez, Y. M. (2022). Juegos para elevar la motivación hacia la actividad física en adultos mayores. Podium. Revista de Ciencia y Tecnología en la Cultura Física, 16(2), 436-450. 23 de octubre. http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1996-24522021000200436

Martínez, M. Á. A., Montero, P. J. R., & Rodríguez, E. M. A. (2021). Efectos de un programa de ejercicio físico multicomponente sobre la condición física, la autoestima, la ansiedad y la depresión de personas adultas-mayores. *Retos: nuevas tendencias en educación física, deporte y recreación*, (39), 1024-1028.

Mera, M. A., Morales, S., & García, M. R. (2018). Intervención con actividad físico-recreativa para la ansiedad y la depresión en el adulto mayor. Revista Cubana de Investigaciones Biomédicas, 37(1).

Mercedes, M., Álvarez, J. C., Guallichico, P. A., Chávez, P., & Romero, E. (2017). Entrenamiento funcional y recreación en el adulto mayor: influencia en las capacidades y habilidades físicas. Revista Cubana de Investigaciones Biomédicas, 36(4), 1-13. 23 de octubre de 2022. http://www.revibiomedica.sld.cu/index.php/ibi/article/view/22

Mora. S., Redberg, R., Cui, Y., Whiteman, M., Flaws, J., Sharrett, A. (2003). Ability of exercise testing to predict cardiovascular and all-cause death in asymptomatic women: a 20-year follow-up of the lipid research clinics prevalence study.[see comment]. JAMA. 290 (12), 1600-7.

Quiala Barroso, W., Chang Girón, Y. C., & Pons Núnez, A. M. (2020). Ventajas de una alternativa metodológica para la evaluación de la condición física en la educación primaria. Mundo FESC, 10(S1), 49-59. https://www.fesc.edu.co/Revistas/OJS/index.php/mundofesc/article/view/395

Quiala Barroso, W., Chang Girón, Y. C., & Pons Núñez, A. M. (2019). Alternativa metodológica para la evaluación de la condición física en las escuelas primarias rurales. *Olimpia, 16*(56), 183-195. https://revistas.udg.co.cu/index.php/olimpia/article/view/915 .

Quiala Barroso, W., Mesa Peña, R., Lussati, F., Chang Girón, Y. (2021). Procedimientos para evaluar la condición física a los alumnos de enseñanza secundaria en Angola. Revista PODIUM, enero-abril 2021; 16(1):187-200

Rosa Guillamón, A. (2017). Análisis bibliográfico de las baterías de evaluación de la condición física. *Revista Peruana de ciencia de la actividad física y del deporte, 4*(4), 533-543. https://www.researchgate.net/profile/Andres_Guillamon/publication/323759194_

Secchi, J. D., García, G. C., & Arcuri, C. R. (2016). Evaluación de la condición física relacionada con la saluden el ámbito escolar_ un enfoque práctico para interpretar e informar los resultados. Enfoques, XXVIII(2), 67-87. Obtenido de https://www.redalyc.org/pdf/259/25955334004.pdf

Solis-Urra, P., Fernández-Cueto, N., Nanjarí, R., Huber-Pérez, T., Cid-Arnes, M. P., Zurita-Corvalán, N., ... & Cristi-Montero, C. (2019). A mejor condición física mejores resultados de una ley contra la obesidad. *Retos*, *36*(36), 17-21.

Vaca, V., Cedeño, F. (2022). Motivación hacia la práctica de actividades físicas en asistentes del centro gerontológico las Piñas del Cantón Milagro.

Conflict of interest statement:

The author declares that there are no conflicts of interest.

Author's contribution:

The author is responsible for writing the work and analyzing the documents.