

The analysis and interpretation of the results of physical tests. A necessity to solve in the control of the preparation
El análisis e interpretación de los resultados de pruebas físicas. Una necesidad a resolver en el control de la preparación

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ABSTRACT

The research deals the procedures that are taken into account for the analysis and interpretation of the results of general physical tests and to improve the control of physical preparation in young athletes of Basque Pelota in the hard hand modality of the EIDE in Guantánamo, theoretical, empirical and statistical-mathematical methods were used, the theoretical foundations related to the subject were reviewed and the problem was diagnosed, which allowed to verify the veracity of the problem posed, and from this, the procedures for its solution were determined, taking as a way of concretion the control of physical preparation and as the center of direction of the process to the coaches, which finally allowed to verify the practical effectiveness that the proposal made has for the coaches.

Keywords

Control; Analysis; Interpretation; General physics test; General physical preparation.

RESUMEN

En la investigación se aborda sobre los procedimientos que se tienen en cuenta para el análisis e interpretación de los resultados de las pruebas físicas generales y mejorar el control a la preparación física en los atletas juveniles de Pelota Vasca en la modalidad mano dura de la EIDE en Guantánamo, se emplearon métodos teóricos, empíricos y estadístico-matemáticos, se realizó la revisión de los fundamentos teóricos relacionados con el tema y se diagnosticó el problema, lo que permitió constatar la veracidad del problema planteado, y a partir de ello, se determinaron los procedimientos para su solución, tomando como vía de concreción el control de la preparación física y como centro de dirección del proceso a los entrenadores, lo que permitió finalmente, comprobar la efectividad práctica que tiene para los entrenadores la propuesta realizada.

Palabras clave

Control; Análisis; Interpretación; Pruebas físicas generales; Preparación física general.

INTRODUCTION

Great efforts have been made by sports researchers to create tests that allow the performance and effect of physical efforts on the body of athletes to be controlled.

Among the control methods, tests occupy an important place by allowing the knowledge of the individual particularities of athletes to be obtained, among which we can mention Harre (1988); Zatsiorski (1989); Ozolin (1989); Zamora (1998); Campos and Cervera (2000); López (2006); Claudio (2006) and McGuigan (2017), who agree that, whether carried out on the field, in the gym or in the laboratory, they constitute an instrument, procedure or technique used to obtain quantitative information related to the degree of efficiency and skills achieved by students, also constituting an evaluative element of the sports teaching process.

For McGuigan (2017), in his case, strength and conditioning specialists, in this work understood as coaches, possess extensive knowledge of exercise science, effectively use tests and measurements to make training decisions so that athletes achieve their goals and make the most of their potential. Tests and measurements form the objective core of the evaluation process (p. 551).

Tests serve to determine athletic talent, to identify physical abilities in areas that need improvement, to set goals and evaluate progress. (p. 552).

McGuigan (2017), defines the following concepts (p. 553):

- Test. procedure for assessing the ability to perform a particular effort. Field test. A test used to assess ability that is performed away from laboratories and does not require extensive training of personnel or expensive equipment.
- Measurement. The process of collecting test data.
- Evaluation. The process of analyzing test results for decision-making purposes. For example, a coach examines the results of physical performance tests to determine whether an athlete's training program is effective in achieving training goals and whether program modifications are needed.

Also in this work, shares McGuigan's (2017, p. 554) view, when he states that the evaluation of the quality of tests indicates that test results are only useful if they really measure what they are supposed to measure (validity) and if the measurement is repeatable (reliability). These two characteristics are the key factors for evaluating the quality of tests and must be present for them to be useful. In this sense, he adds:

- Validity is the degree to which a test or test item measures what it is supposed to measure; this is one of the most important characteristics of tests (p. 554).
- Reliability is a measure of the degree of consistency or repeatability of a test. A test must be reliable to be valid, because highly variable results offer very little meaning (p. 558).

Regarding the selection of tests, McGuigan (2017, p. 559) states that when determining whether the tests show high levels of validity and reliability, the strength and conditioning specialist, in this work, the coach, must rely on his knowledge and practical experience with the sport. He must consider the specificity of the sport (e.g., metabolic energy systems, biomechanical movement patterns), the athlete's experience, training status, age, and environmental factors when selecting tests.

Physical tests must be selected in such a way that they respond to the elements raised to contribute to adequate control, but diagnoses related to the control of the general physical preparation of youth athletes of Basque Pelota in the *mano dura* modality of the EIDE in Guantánamo, reflected inconsistency during the physical preparation in the control carried out by the coaches, caused by a poor analysis and interpretation of the results of the general physical tests, by not taking into account the appropriate procedures, generally limiting themselves to the physical aspect.

This insufficiency led to a scientific problem: What procedures should be taken into account for the analysis and interpretation of the results of general physical tests and to improve the control of physical preparation in young Basque Pelota athletes in the heavy-handed modality of the EIDE in Guantánamo?

In order to solve the research problem, the following objectives are proposed: To determine the procedures to be taken into account by coaches for the analysis and interpretation of the results of general physical tests and to improve the control of physical preparation in young Basque Pelota athletes in the heavy-handed modality of the EIDE in Guantánamo.

METHODS

This work was carried out with the two (2) Basque Pelota coaches who work with the hard-handed modality in the youth category of the EIDE in Guantánamo and for the application of the general physical tests, to the four (4) athletes of this modality.

In this research, the theoretical methods of induction-deduction, analysis-synthesis and the systemic approach were used. Empirical: the documentary study, the interview and the consultation with specialists.

This work responds to the technological demand of this sport in Guantánamo. Such an effort corresponds to what is expressed in the Constitution of the Republic of Cuba (2019), Title III, article 32, paragraphs a, d and f regarding the foundations of educational, scientific and cultural policy; as well as in Guidelines 115, 117 and 118 of the Economic and Social Policy of the country, declared at the Conference of the Communist Party of Cuba.

RESULTS

Basis of the proposal for the analysis and interpretation of the results of the physical tests

In this part of the work, aspects related to the general physical tests for the control of conditional physical capacities in young athletes of Basque Pelota in the strong hand modality of the EIDE in Guantánamo are addressed, in which the coach has an important leading role, which is why he must have mastery of the aspects referred to below.

The criterion of Sandes (2020, p.6) is shared when he refers that the pedagogical group (the coaches) constitutes the closest and most vivid source to plan, apply, control, evaluate and interpret the general physical tests in achieving the objectives of physical preparation, making it necessary to organize their scientific work, through actions such as:

- Mastery of the objective of the PIPD and, fundamentally, of the category with which one works in order to achieve the objective of physical preparation in a coherent manner in correspondence with this.
- Full mastery of the methodology of the general physical tests that are planned, to ensure adequate control.
- Determine the precise moments in which the tests must be applied within the training planning, taking into account the objective to be achieved with each test and each moment.
- Establish, if necessary, prior contacts to guarantee the human and material conditions to apply, analyze and interpret the tests.
- Direct the work with the athletes towards achieving the motivation that is needed for the correct application of the general physical tests.
- Always guarantee the same conditions and requirements for the application, analysis and interpretation of the tests.

In this work, to illustrate the procedures proposed for carrying out the analysis and interpretation of the results of physical tests, the same general physical tests that coaches use in their planning were taken.

The tests are:

No.	Test	Energetic Sistem	Physical Capacity
1.	10 meters race	Anaerobic host	Fast of reaction
2.	Long jump without impulse		Explosive force
3.	Greater amount of repetitions of plates in 20 seconds		Fast force
4.	Greater amount of repetitions of abdsominal in 20 seconds		
5.	Greater repetitions of plates in 2 minuts	Anaerobic lactacid	Resistance of the force
6.	Greater amount of repetitions of abdsominal in 2 minutes.		
7.	12 minuts of race or test of Cooper	Aerobic	Aerobic resistance

Table No. 1. Shows the relationship between tests, energy systems and conditional physical capacities.

These tests always comply with the following structure:

- Name of the test.
- Objective.
- Methodological indications.
- Protocol or table for data collection, physical evaluation and statistical processing.
- Analysis and interpretation (Statistics and physical-functional) of the results obtained.
- Comparison of the results between the first and second measurement.

In this work for the analysis and interpretation of the results of physical tests, McGuigan (2017, p. 567) shares the criteria when stating that an important element to take into account is the sequence of tests, emphasizing that knowing the science of exercise helps to determine the correct order of the tests and the duration of the rest periods between them to ensure their reliability. The fundamental principle when sequencing the tests should be that one test does not alter the performance of the following ones. This allows for optimal performance in each test and also makes it possible to establish valid comparisons with the results of previous tests.

A logical sequence, although there are some variations, involves administering tests in this order:

- Non-fatiguing tests.
- Agility tests.
- Maximum strength and power tests.
- Speed tests.
- Localized muscle endurance tests.
- Anaerobic capacity tests.
- Aerobic capacity tests.

The opinion of McGuigan (2017) is shared when he states that in the statistical evaluation of test data, once the test or tests have been chosen, they have been administered and the scores have been collected, the next step includes all or part of the following: análisis de los datos para determinar el cambio en el rendimiento de las personas o del grupo durante el período de entrenamiento (semanas, meses o años);

1. Analysis of an individual's or group's performance relative to that of another similar individual or group in the past;
 2. Analysis of the relationship between individual athlete scores and group scores, and comparison of individual scores to the local, state, national, or international norm.
- One of the most important purposes of performance retesting is the evaluation of individual athlete improvement and the overall effectiveness of the fitness program as determined by changes in test results.
 - A score difference is the difference between an athlete's score at the beginning and end of a training period or between scores on two tests separated in time.
 - Percentage change is another measure that can be used; however, evaluating the effectiveness of a training program simply by the degree of improvement has two serious limitations
- ✓ First, athletes who begin the training period in a higher training state will not improve as much as untrained athletes whose performance was poor at the beginning of training. The adaptation window for different physical abilities is often longer for well-trained athletes.
 - ✓ Second, athletes may deliberately not push themselves to their maximum in pre-training tests in order to inflate their scores in post-training tests.

- ✓ It is important to convince athletes to push themselves to their maximum in both pre- and post-training tests.

An important element is that the coach makes athletes aware of the need to carry out the tests with the greatest motivation, discipline and effort to achieve the proposed objectives by understanding the importance that general tests provide for them, and must use language in his explanation that is familiar to the athletes, so that they receive the necessary and sufficient information.

Procedures for the analysis and interpretation of the results of physical tests

Coaches are asked to comply with the control-evaluation relationship and from there carry out the analysis and interpretation of the results obtained in each test, giving an output to each of the following aspects:

1. In a protocol or table prepared by you, record the result of each test and its evaluation.
2. Perform the statistical processing.
3. Analyze and interpret each test from a statistical, physical and functional point of view, taking into account that:
4. From a statistical point of view, you are proposed to use the arithmetic mean, the standard deviation and the coefficient of variation as statistics, for which you will take into account that:
 - The arithmetic mean and the standard deviation are expressed in the same unit of measurement or element that the test measures, in this case, the projections.
 - The standard deviation and the coefficient of variation express the degree of dispersion of the sample with respect to the mean.
 - In the case of the coefficient of variation, it is expressed in percent (%), knowing that:

Si este se comporta entre cero y 10 %, refleja un pequeño grado de dispersión de la muestra con respecto a la media (La muestra es homogénea).

- ✓ If it behaves between 10 and 50%, it reflects a certain degree of dispersion of the sample with respect to the mean (The sample is quite homogeneous).
- ✓ If it behaves above 50%, it reflects a high degree of dispersion of the sample with respect to the mean (The sample is heterogeneous).

From the physical-functional point of view, the results obtained by the athletes will be taken into account from the control-evaluation relationship of the results in each test, and the

performance of those who are above or below the average must be assessed from the average obtained, and the behavior of those who are above or below the average must be analyzed and interpreted, highlighting those with the worst and best results.

From this analysis, it can then be inferred that those who obtained the best results did so because they had a greater development of the adaptations that ensure the energy supply of the predominant system for muscular work during the test and therefore of the physical capacity that is controlled.

DISCUSSION

The diagnosis carried out by applying an interview to the coaches, the review of the training plans and the observation of the sessions dedicated to the control of physical preparation, allowed us to verify that:

100% of the coaches:

- It takes into account the aspects for the application of physical tests.
- It applies a battery of tests selected by the group, taking into account the characteristics of the sport and the athletes, not limiting itself only to those indicated in the comprehensive preparation program for the athlete.
- It prepares an evaluation scale to control and evaluate the results of the athletes, not using the one that appears in the program.
- It carries out the analysis and interpretation of the results only with the data obtained by the athletes in each test and their evaluation.
- It reflects difficulties in carrying out adequate control by not taking into account procedures such as:
 - ✓ Statistical processing, and; physical-functional analysis (Relationship between the result obtained, the energy system and the controlled physical capacity), affecting the veracity of the control.
 - ✓ It is considered important that the necessary aspects be provided to improve the control of general physical preparation.

After analyzing and interpreting the physical tests applied during general physical preparation, taking into account the proposal made, the coaches expressed a high level of satisfaction by stating that said proposal allows them to:

- ✓ Carry out individual and group analysis of their athletes.
- ✓ Establish or reorganize work groups.

- ✓ Plan or reorient the planning of physical loads.
- ✓ Evaluate the planned training process.
- ✓ Make new predictions.
- ✓ Among other aspects.

CONCLUSIONS

The procedures to be taken into account by the coaches for the analysis and interpretation of the results of the general physical tests were determined, which contributed to improving the control of the physical preparation of the young Pelota athletes.

The coaches valued the proposed procedures with a high level of acceptance by qualifying their structural and methodological conception, the logical and methodological order of the steps, the level of satisfaction as a solution to the problem posed, the possibilities of its implementation and in general in the category of total agreement.

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