

Effect of physical rehabilitation on executive functions in a girl. Case study
Efecto de los ejercicios de rehabilitación física, sobre las funciones ejecutivas
en una niña. Estudio de caso

Osmel Guibert-Heredia,¹ Angel Luis Román Hernández², Yuri Torres Acosta³

¹*Bachelor. Provincial Sports Directorate, Guantánamo. Cuba.*

²*Dr.C. Guantánamo University, Faculty of Physical Culture, Guantánamo. Cuba.*

³*Dr.C. Guantánamo University, Faculty of Physical Culture, Guantánamo. Cuba.*

Email:

osmelgh@gmail.com

angelr@gmail.com

yuriata@gmail.com

Date of receipt: October 25, 2025

Date of acceptance: November 20, 2025

ABSTRACT

This research is based on a methodological alternative for identifying karate practitioners with immediate potential within the talent selection process in Karate-Do, specifically in the 11-12-year-old age group, in Guantánamo province. A literature review of relevant documents revealed an insufficient number of instruments designed for this purpose. The research methods employed were theoretical (induction, deduction, analysis, synthesis, and systemic-structural-functional) to develop the proposed approach; empirical (observation, interviews, and surveys); and statistical (percentage calculation). The population consisted of 20 karate practitioners in the 11-12-year-old age group from the Guantánamo municipality's pre-selection program.

RESUMEN

La investigación se sustenta en una alternativa metodológica para identificar los karatecas perspectiva inmediata dentro del proceso de selección de talentos en el Karate-Do, en la categoría pioneril 11-12, provincia Guantánamo. En la revisión bibliográfica realizada a documentos rectores, se pudo constatar insuficiente existencia de instrumentos destinados para esta finalidad. Los métodos utilizados en la investigación fueron del nivel teórico inducción deducción, análisis síntesis, y el sistémico estructural funcional para elaborar la propuesta; del nivel empírico se empleó la observación, entrevista y la encuesta; del nivel estadístico matemático el cálculo porcentual. La población se conforma por 20 karatecas de la categoría 11-12 años

Keywords

Methodological alternative;
perspective, talent selection.

Palabras clave

Alternativa metodológica; Perspectiva
inmediata; Selección de talento.

INTRODUCTION

The continuous development of sport is linked to the growing development of technology, upon which not only most sports disciplines but all physical activity now depend (Bosque J, 2017). Both sports training and monitoring processes rely on applied sciences. The means and instruments for training and measuring results, as well as competition venues, face increasing demands for new equipment to protect athletes, set new records, facilitate practice, and contribute to achieving peak athletic performance. Given that talent in sports today is one of the main conditions for achieving great results, its identification has become a scientific priority. This has led to sports selection becoming a subject of study addressed by numerous scientists, who have dedicated a considerable amount of research and publications to it.

Therefore, working with young talents has required specialized attention from experts, particularly regarding the initiation of sports practice at an early age, a period marked by various experiences. Positive factors, related to reaching the pinnacle of athletic mastery, and on the other hand, having a short career in the sport.

Based on all of the above, the following shortcomings were identified:

1. Deficiencies in the practical and methodological approach to talent selection in grassroots Karate-Do.
2. Lack of pathways and procedures that foster the establishment of structural and functional relationships for identifying karate practitioners with immediate potential within the Karate-Do talent selection process, according to the characteristics of the category.
3. Lack of scientific rigor in the indicators used to evaluate the identification of karate practitioners with immediate potential within the Karate-Do talent selection process.

Having identified the shortcomings, we can now define the following **research problem**: how to contribute to improving the identification of karate practitioners with immediate potential within the talent selection process in Karate-Do? To address this problem, the object of study is defined as: the talent selection process in Karate.

For this research problem, the following **objective** is proposed: to develop a methodological alternative for identifying karate practitioners with immediate potential within the talent selection process in Karate-Do, with an integrative approach based on physical, technical, and psychological factors in the 11-12-year-old pre-selection category of the municipality of Guantánamo, Guantánamo province.

The **scope of action** is defined as: identifying karate practitioners with immediate potential using physical, technical, and psychological indicators in Karate-Do in the 11-12-year-old pre-selection category of the municipality of Guantánamo.

The **research methods** and techniques used were selected based on a dialectical materialist approach, derived from the scientific methods applied in the research process.

At the theoretical level:

Analytical-synthetic: This method was used to characterize the object and field of research, as well as to analyze and synthesize the information obtained from the consulted literature, determine the particularities, and discover relationships and the logic to follow in obtaining scientific knowledge related to the talent selection process in Karate.

Inductive-deductive: This method was used to combine the movement from the particular to the general, enabling generalizations. It was specifically applied from the selection of the most general objectives of the talent selection process in Karate-Do, down to the more specific objectives regarding the identification of physical, technical, and psychological factors.

Documentary analysis: This method was used to analyze the Comprehensive Karate-Do Athlete Preparation Program, competition regulations, and the teaching program. **Systemic Structural Functional:** by establishing the relationship between the identification of physical, technical and psychological factors in the methodological alternative for the identification of immediate prospects within the talent selection process in Karate-Do,

From the empirical level:

Document review: allows for reviewing, analyzing, and defining what has been written on the topic.

Interviews: conducted with Karate-Do coaches from the Guantánamo municipality who work with the 11-12-year-old category, to understand their criteria for identifying karatekas with immediate potential within the talent selection process, as well as to evaluate the impact. (Appendix No. 1).

Surveys: administered to 3 Guantánamo sports specialists and managers to determine the shortcomings and evaluation of the alternative, its effectiveness, and the extent to which it contributed to improving their results. (Appendix No. 2).

Observation: to observe how the identification of karatekas with immediate potential is carried out within the talent selection process, the methodological improvement work of the coaches and managers during the registration validation process, and the declaration of

potential prospects. Expert criteria: assess the feasibility of a methodological alternative for identifying the physical, technical, and psychological factors for talent selection in Karate-Do in the 11-12-year-old pioneer category of the Guantánamo municipality pre-selection. (Annex No. 3).

Pedagogical tests: These were used in the pre- and post-experiment phases to evaluate the initial state of the physical, technical, and psychological factors, and then, once the alternative was applied, to validate its effectiveness.

Pre-experiment: To evaluate the initial state of the identification of physical, technical, and psychological factors for talent selection in Karate-Do in the 11-12-year-old pioneer category of the Guantánamo municipality pre-selection team.

Mathematical and/or statistical level.

Percentage calculation technique: To quantify and interpret the results obtained during the research.

Arithmetic mean: To process the collected information. Likert scale.

Population: This consists of 20 karate practitioners from the Guantánamo municipality pre-selection team, of whom 6 are female (30%) and 14 are male (70%). In addition, there are 5 coaches working with this category and 3 Guantánamo directors. Practical contribution: it takes shape as a methodological alternative supported by physical, technical and psychological factors to be able to evaluate and identify karate practitioners with immediate prospects within the talent selection process for the 11-12-year-old category.

Scientific novelty: This work presents a methodological alternative for identifying karate practitioners with immediate potential within the talent selection process in Karate-Do. It uses an integrative approach, considering physical, technical, and psychological factors, in the 11-12-year-old pre-selection category for the municipality of Guantánamo, Guantánamo province. The thesis is structured as follows: introduction, two chapters with their conclusions (the first addresses the theoretical framework for talent selection in Karate-Do and the identification of karate practitioners with immediate potential, and the second focuses on the methodological alternative and its corresponding practical validation), as well as recommendations, bibliography, and appendices.

RESULTS

The methodological alternative and its practical validation

To substantiate the development of the alternative, various criteria presented in research related to the proposal are analyzed. Therefore, a methodological alternative is defined as: an option that seeks to solve a problem, which is not unique nor does it exclude other possible actions, and which is susceptible to adjustments and improvements.

Among the most representative definitions is that offered by the educator Sierra (2002). An alternative is: an option among two or more variants available to the governing subsystem (educator) for working with the directed subsystem (students), based on their characteristics, possibilities, and their context of action.

However, according to Addine (2002), cited by Gamboa (2018), "Every methodological alternative must consider joint actions by all factors within the school to achieve the desired objectives; this is an important part of the systematic planning of the pedagogical process." This definition refers to the implementation of actions involving school resources to achieve a specific goal, taking into account order and systematicity in the process.

Sierra (2002) considers the alternative as: "a set of actions, evaluated, planned, and well-structured for application during the teaching process, responding to a need and resulting from an intellectual process derived from the study and diagnosis of educational situations." The requirements considered specific to this methodological alternative are presented in their formulation, concatenation, and interrelation in such a way that they function as a system, thus constituting theoretical contributions to the research.

Specific Methodology Requirements:

- Diagnostic criteria requirement.
- Content selection requirement.
- Content organizational logic requirement.
- Learning strategy definition requirement.

The essence of each of these is explored in more detail:

1. Diagnostic criteria requirement.

This stage is essential in the proposed alternative methodology. Its implementation provides the most significant elements that serve as benchmarks for training—needs, motivations, interests, potential, learning limitations, learning capacity, and appropriate support levels. The result allows for the conception and promotion of individualization, the adoption of objective

strategies to carry out the training process, and informs the planning and execution stages. It also complements the evaluation stage of the alternative methodology.

2.Requirement for the selection of technical content.

This requirement guarantees the teaching of all technical elements for each invariant of Karate Do that is inherent to the technical content of the 11-12 year-old category and the student's style grading program. Therefore, it ensures the learning of the necessary and essential aspects that the karateka must execute. Its fulfillment complements the planning, execution, and evaluation stages of the alternative methodology.

3.Requirement for the organizational logic of the content.

It determines the quality of the training process for the technical elements of Karate Do. At this point, the selection and comparison of technical content within the proposed organizational methodology for teaching clarify the algorithm that guarantees organization by steps and invariants.

The organizational logic derived from the algorithm ensures accessibility and affordability, since the arrangement of the invariants responds to levels of complexity and guarantees, with a systemic approach, the systematization of teaching.

4.Requirement for defining the learning strategy.

The requirement for defining the learning strategy indicates the obligation to assume pedagogical direction in the transformation of an object from its current state to a desired state (Addines, 1997).

The strategy establishes the need to design an instructional approach that is tailored to the demands of Karate-do and the individual needs fostered in learning the technical elements for kata and/or kumite. This approach appropriately adopts one of the following variations: kihon/kata, kihon/kumite, or kihon/kata/kumite. The learning strategy will be promoted through intermediate, progressive, and coherent actions that allow for the gradual achievement of the proposed objectives.

Taking into account the theoretical background addressed and considering what the stages of the applied alternative should be for the identification of the physical, technical and psychological factors for the selection of Karate-Do talents in the 11-12-year-old pioneer category of the pre-selection of the Guantánamo municipality, in which well-directed stages and actions are taken into account to achieve the proposed goal, the following stages were determined:

- ✓ Diagnosis and characterization
- ✓ Implementation
- ✓ Monitoring and evaluation

These stages have a dialectical and interdependent relationship, adhering to the principles of systematicity and systems.

The first stage involves a diagnostic assessment to determine the actual needs for identifying the physical, technical, and psychological factors required for talent selection in Karate-Do for the 11-12-year-old pioneer category of the Guantánamo municipality pre-selection program.

The main actions of the first stage include:

- Development of instruments for the application of the comprehensive diagnosis that addresses the proposed objectives. (Responsible: Researcher).
- Application and tabulation of the comprehensive diagnosis, including surveys, interviews, and observations of training and competitions. (Responsible: Researcher).
- Inferring the patterns derived from the previous step. (Responsible: Researcher).
- Training the human resources involved in this process using the different methodological approaches. (Responsible: Researcher).

This stage is the starting point for implementing the methodological approach. It will yield the results of the diagnosis of the object's current state, allowing for continuity in the next stage.

The second stage will proceed as follows:

- Organizing a methodological meeting at the municipal level to explain the characteristics of the work to be carried out by the different subsystems and to achieve greater clarity regarding the tasks to be undertaken. (Responsible: Researcher).
- Plan the different subsystems or organizational levels of the methodological work based on the tasks for identifying the physical, technical, and psychological factors for talent selection in Karate-Do for the 11-12 year old pioneer category of the Guantánamo municipality pre-selection. (Responsible: managers and researcher).
- Plan the proposed system of indicators to evaluate and identify karate practitioners with immediate potential. (Responsible: researcher).
- Begin the various training sessions, such as: (Responsible: researcher).

Methodological activity on the conceptualization for identifying the physical, technical, and psychological factors for talent selection in Karate-Do in the 11-12-year-old pioneer category of the Guantánamo municipality pre-selection.

(Responsible: Researcher).

Methodological activity on the importance of the physical factors to be evaluated (flexibility and conditional abilities (speed-action) and movement) and coordination. (Responsible: Researcher).

Methodological activity on the importance of kata technical factors to evaluate:

Happo Waza transfers.

Ushi ken waza (closed hand striking technique).

Seiken tsuki, Tate tsuki, Ura tsuki, Kage tsuki, Mawashi tsuki, Uraken, Tate tetsui.

Ushi kaisho waza (open hand striking technique).

Gohon nukite, Tate shihon nukite, Ura shihon nukite, Mawashi shuto, Haito ushi, Teicho ushi.

Uke ken waza (closed hand blocking technique).

Gedan barai, Ushi uke, Soto uke, Jodan age uke, Otoshi uke.

Uke kaisho waza (open hand blocking technique).

Gedan shuto barai, Osae Uke, Haito Uke, Jodan Shuto Age Uke, Shuto uke.

Geri Waza.

Mae hiza geri, Mawashi hiza geri, Kinteki geri, Mae geri (gedan and shudan).

Kakato geri, Mawashi shudan, Mawashi jodan, Yoko Geri.

Evaluation scale for kata techniques

One error ---- Good

One error ---- Fair

Two errors ---- Poor

Methodological activity on the importance of the technical factors of kumite to be evaluated:

- Geri (mae geri, mawashi geri, ura mawashi, mawashi shudan).
- Strikes (uraken, kisami stuki, oi stuki, two steps).
- Blocks (High with the lead hand and with the rear hand, Middle area with the lead and rear hands, With trunk movement).
- Footwork (Simple footwork, Footwork with flat steps, Forward footwork, in circles, at 45 degrees).

Evaluation scale for kumite techniques

1 to 2 errors ----Good

3 to 4 errors ---- Fair

More than 5 errors --- Poor

Methodological activity on the importance of the psychological factors to be evaluated:

Temperament (specific tests)

Motivation (10 Wishes test)

Development of systematic integrative evaluations. (At the end of each topic.)

Development of final evaluations for monitoring (Weekly. Responsible: Researcher).

In the third stage, the following actions are proposed:

Establish indicators to evaluate the applied alternative. (Researcher, specialists, and administrators). (Responsible: Researcher).

Conduct classroom monitoring to control and evaluate the effectiveness of the study. (Administrators. Monthly).

Design methodological preparations to provide feedback and correct the deficiencies detected. (Teachers and researcher).

BIBLIOGRAPHIC REFERENCES

Addine Fernández, F. (2002). Principios para la dirección del proceso pedagógico. Compendio de Pedagogía. La Habana: Editorial. Pueblo y Educación.

Addine Fernández, F. y García Batista, G. (2004). Didáctica: Teoría y práctica. Compilación. Compendio de Pedagogía. Ciudad de la Habana: Editorial Pueblo y Educación. Cuba.

Álvarez de Zayas, C. M. (1995). Alternativa metodológica de la investigación científica. Ciudad d la Habana.

Álvarez de Zayas, C. (1985). Metodología de la investigación científica. Santiago de Cuba, Universidad de Oriente. P. 65.

_____ (1995). La investigación científica en la sociedad del conocimiento.

Álvarez de Zayas, C. M. (2002). Introducción a la investigación científica. Santiago de Cuba: Universidad de Oriente.

Álvarez de Zayas, C M. (1999). La escuela en la vida. La Habana: Pueblo y Educación.

Álvarez Martínez, Y. (2006). Caracterización de la motivación de logro en deportistas de los centros de alto rendimiento de Matanzas. Trabajo de diploma. Matanzas, Facultad de Cultura Física.

Blázquez Sánchez, D. (1995). La iniciación deportiva y el deporte escolar. Barcelona: INDE.

Bompa, T. (1987). La selección de atletas con talento. Revista de entrenamiento deportivo, 1(2),46-54.

- Bulgakova, N. y Voronov, A. (1978). Comment pronostiquer les capacités des nageurs en s'appuyant sur les recherches longitudinales. *Teoriza y praktika*, 7, 37-40.
- Collazo Macías, A. y Betancourt, N. (2006). *Teoría y metodología del entrenamiento deportivo*. Tomo II. (Material no publicado). Instituto Superior de Cultura Física Manuel Fajardo. La Habana.
- García Manso, J.M., Navarro Valdivieso, M., Ruiz Caballero, J. (1996). *Planificación del entrenamiento deportivo*. Madrid: Gymnos.
- García Manso, J.M. (2003). *El talento deportivo. Formación de elites deportivas*. Madrid: Gymnos.
- Gollvik, L., Kellerth, J., Ellerth, O., Ulfhake, B. (1986). The effects of tenotomy and compensatory hypertrophy on the postnatal development of soleus motor units in the cat. *Acta Physiologica Scandinavica*, 126(4), 565-573.
- Hahn, E. (1988). *Entrenamiento con niños*. España: Martínez Roca S.A.
- Ilisástigui, M. (1999). *Sistema de selección Deportiva en la Gimnasia Rítmica para los centros de alto rendimiento*. (Tesis de doctorado). Instituto Superior de Cultura Física Manuel Fajardo. La Habana.
- Klissouras, V. (1983). Fattori genetici e prestazione sportiva. *SdS. Revista di Cultura Sportiva. Scuola dello Sport. CONI*, 2,(1), 34-41.
- Criterios metodológicos ... ' Jorge Luis Pichardo-Videaux, Liuben Ray-Castro Vol. 9, Número Especial (2019) RNPS.