



Review Article

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# Model of Physical-Technical Preparation for the Discipline 400 Meters with Fences, Category 16-17 Years



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## Abstract

The present study was carried out with the purpose of elaborating a model of physical-technical special preparation of the discipline 400 meters with fences, category 16-17 years. Different methods and techniques were used that allowed to base the object and field of the investigation, to determine the irregularities existing in the theory and in the practice of the studied discipline. The need to elaborate the model is corroborated from the diagnosis, where among other things, it is revealed that the special physical-technical preparation in the studied discipline has a change in the methodological procedure, since the conception in its treatment during the preparation of the Vallistas does not have an integral character, in the consulted literature it is not addressed how the tasks of the preparation system being studied are integrated, even though sports specialists point out the importance and significance of this integration, in order to achieve a qualitatively superior level of Technical-Sports Expertise; while athletes have Physical-Technical Deficiencies that do not correspond to their potential, so that the subsystems that contain related methodological requirements are conceived, which allow the planning, execution and control of the preparation process in the discipline described. The results achieved reveal the feasibility of the practical studies, manifested in the positive changes in the Physical-Technical Dimension and in the improvement of the results achieved by the athletes during their implementation.

**Keywords:** Physical-Technical Preparation; Integration of Physical-Technical Tasks; Basic Requirements; Biodynamic Structure of the Race; Self-Assessment; Self-Reflection

## Introduction

The model represents the most significant aspects that from the systematization of the specialized literature, the results derived from the previous diagnosis, as well as the theoretical and practical experience of the author of this research, contribute to the development of the physical-technical condition of the Athletes of the discipline 400 meters with fences, under the organization of the process with an integrating approach to the training tasks. It establishes the distinctive features on the basis of a scientific basis and this allows adjusting and transforming the reality in which the preparation system manifests itself.

It includes a foundation explaining the social need for the performance of the athlete the structuring variant that is proposed, based on this the role of the model that consists in contributing to the development of the special Physical-Technical Condition, with emphasis in the reproduction of the Physical-Technical Potentialities of the hurdlers to the

changing conditions of competitive activity. The procedures for its implementation are synthesized in the existing relations between the evaluation subsystems on the determining factors for the mastery of the technique, manifestation of the special physical development and disposition for the development of the special Physical-Technical Condition, those that assume critically positions of the theory and methodology of sports training, in order to guarantee adequate variants of structuring the contents of Physical-Technical Training.

In this case, the objective is to guide the coaches of the discipline being studied, the main elements to be considered in the Physical-Technical Preparation of the athlete who goes through the stage of deep specialization, taking into account that the bibliography consulted does not they have evidence of methodological orientations aimed at promoting the integrating nature of the components of the preparation object of the present study.

### Development

The development of the physical and technical condition of the corridor of 400 meters with fences is a change in the methodological procedure, as a consequence of the integration of these contents. For this, it is necessary that the preparation of the athlete is designed in order to generate new processes of adaptation, through the application of loads of training, adjusted to the demands of the discipline, from the first moments of preparation.

Reason why it is essential the consequent integration of the training tasks, for the fulfillment of the objectives in different moments of the preparation, in order to achieve a favorable state, depending on the sporting results. In relation to the above, it is necessary to develop a scientific product that guarantees the determination of the essential elements of the process, from which the development of the special Physical-Technical preparation of athletes passing through the specialization stage must be oriented. Initial start in the 400 meters hurdles test in athletes. The reflection of objective reality in certain circumstances, given the characteristics of the environment, in which sports activity is framed, constitutes the model that guides the way for the transformation of the fundamental factors that influence the system of preparation of athletes.

The criteria expressed by the authors García [1], F González 1999, Ruiz [2], B Castellanos [3], A Sierra 2002, O Valera 2000, N de Armas 2003 on the model allow to know its use as a way that allows the researcher to simplify the reality or part of it, which is studied, with the aim of solving the identified problem, where there must be a close relationship between its components for a greater compression of information. Based on what has been described for the research, the criteria issued by A Valle [4] are assumed when he states that the scientific model is understood as "The representation of those essential characteristics of the object being investigated, which fulfills a heuristic function, since It allows us to discover and study new relationships and qualities of that object of study with a view to the transformation of reality".

On the use of models in the planning of the training of sprinters and hurdlers VN Platonov [5] considers that they are manifested in the use of the quantitative characteristics of the process, among which refers to the creation of quantitative models of sessions with different purposes, models of weekly cycles of training and precompetitive preparation, stage models, periods, annual preparation cycles with prior knowledge of their influences.

The author also states that "The correct and rational planning of the training consists in finding the optimal intervals between the repeated performances of the exercises in the training sessions and also between the sessions, that is, to find the criterion of the optimal preparation towards the next completion of the exercise, training session or participation in competition".

In relation to the above, to achieve the optimal preparation of the athletes of the discipline studied, it is necessary to find those elements that facilitate the reproduction of the contents aimed at the development of the physical-technical condition of the athlete, so that the athletes manage to reverse the level reached to the conditions of the competitive activity. In this way, adaptation processes are very important, under the effect of the activities that are oriented, with the aim of mobilizing the functional reserves present in the athlete, at each moment of the training cycle.

In the studies carried out by the author, several models related to contemporary sports practice are analyzed, among them those made by the authors such as: JR Villalobos [6], M de Armas 2010, HM Dopico [7], Y Jiménez 2013, E Godo [8] and I Font [9], which in one way or another, contribute to stimulate the improvement of the high performance sports practice, based on the interactivity of the coach and the athlete indistinctly. In general, the need to deepen in those elements that the athlete needs to apprehend the tasks of the physical-technical preparation in the studied discipline, taking into account their individual particularities and the current regularities of the sport, is reason why The author of the research considers that the proposed variant is different from those described, as it is designed to refine the specific components that influence the physical-technical preparation of the 400-Meter hurdles corridor.

To elaborate the model it was necessary to argue it theoretically from the psychological, pedagogical points of view, of the theory and methodology of sports and sociological training; in which the essential aspects to be taken into account in each one of the edges described are justified, in order to guarantee coherence and logical and integrated ordering of the physical-technical training tasks for the discipline 400 meters with fences, which materialize in the didactic strategy that is later conceived, as a practical support of said model.

In the psychological order, the studies carried out by ME Sánchez 2005 on the psychological demands in fast-strength sports, where speed tests are grouped in Athletics, as well as the general psychological aspects of Physical-Technical preparation. In the pedagogical aspect, three fundamental functions are revealed: education, teaching (Instruction), and learning. Education, because it contributes to the comprehensive training of the athlete, in the selection of physical-technical contents, according to their individual particularities, which as a result of scientific contributions, promote the elevation of the special Physical-Technical condition. Teaching (Instruction) in the transmission of theoretical (scientific) knowledge, in terms of focusing attention, on how the athlete learns and to what extent he is able to take advantage of knowledge in sports preparation [10-16].

In this way, the athlete is perceived as the subject and object of their learning, assuming an active and responsible position

in their training process, configuration of their knowledge, skills, values, which promote the formation of their scientific conception of the world. From the sociological is based on Marxist and Martian sociology, sports training is considered as a social phenomenon, with the coach being the facilitator agent, thus transforming the approach of the referred forms the physical-technical special preparation of the 400 meter corridor with fences. From this moment, it is not simply a set of biological and vital needs that drives and provokes the sport activity, but the satisfaction of all the real needs of the hurdlers, with the application of new methods and work styles.

From the theory and methodology of sports training is based on the integration of the contents of the physical-technical preparation, with special character, from the beginning of the training cycle, in order to favor, in better conditions, the transfer and reproduction of the development reached the specific conditions of the competitive activity in the 400 meters hurdles test. From this perspective, it is important to highlight some general features inherent to the proposed model:

- a) Guarantees an active and responsible position of the athlete in the process of special physical-technical preparation.
- b) It guides the synergistic relationships that occur between the components of the model to contribute to the improvement of the special physical-technical preparation.
- c) It favors the development of technical and sports skills necessary for the execution of the discipline in specific conditions of the competitive activity.
- d) Guides the procedure for the individualization of the training tasks.
- e) It fosters the conditions for the rational use of the athlete's available time, in order to achieve a favorable result.
- f) It favors the specific disposition to reach the sport result in fundamental competitions; as well as the consequent sport form at the desired time.

The superficiality manifested in the methodological guidelines described in the comprehensive program of preparation of the athlete in the area of speed 2013, with respect to the training of the corridor of 400 meters with fences, have favored the reproductive character in the teaching of the contents, which differ of the real situations that are evident during the competition, such conditions represent the need to organize the process, that allow to build a theory based on the realities that are manifested in practice, which until today have not been described from this perspective. The main concern of the athletes of this discipline, is given in achieving to dominate their forces to resist maximum levels, with precise movements on and between the fences, fundamentally in the second half of the route, reason why it needs a high anaerobic lactic capacity and a career technique, with the minimum of errors, that allows

you to travel the distance in a balanced way and in the shortest possible time [17-21].

The model is also supported by the Law of Biological Adaptation or basic law of sports training, because the athlete at every moment of preparation has the potential to raise its functional level, generating new adaptation processes, from the systematization in the integrated structuring of the Physical-Technical contents. It is based on different subsystems that favor the orientation of the physical-technical preparation of the 400 meter corridor with fences with an integrating and contextualized approach. Its content and function are described below:

**The subsystem valuation of the determining factors for the domain of the discipline 400 meters with fences, has as a function to prepare the athlete so that they can discern determining factors that influence in the improvement of the technical components of the discipline 400 meters with fences, for the sake of guarantee timely modifications during the execution of the test studied. The components that make up the same are:**

- a) Assessment of the total structure of the discipline 400 meters with fences. It is considered the starting point for the execution of Physico-Technical contents under specific conditions, since they are closely linked to the actions that the athlete must perform during the race based on their individual characteristics and the results they intend to achieve.

In this way, it is important that on the basis of their qualities and potentials, they achieve the self-regulation of the technical elements that guarantee high achievements in competitive activity. In this regard M Pascua 1997 in his studies on the frequency and length of the step, states that each sprinter, must know what his step length is at maximum speed, because if he does not know and he is groping, he can increase the frequency of the step and lose the amplitude or vice versa amplify the step and lower its frequency.

- b) Assessment of the demand profiles. This information is necessary for the athlete, because it promotes greater accuracy and precision for the execution of Physical-Technical preparation tasks, and also receives the guidance to know where to direct efforts to meet the expected requirements. This aspect is summarized in determining the following:

- i. The objective of the physical-technical preparation task.
- ii. The main energy system used during the execution of the discipline.
- iii. The physical-technical and psychological demands of the discipline.

This knowledge allows stimulating the establishment of goals in a conscious and creative way, in addition they constitute reasons that justify their performance in the different stages through which the sports training transits. Therefore, the Self-Reflection of determining factors that characterize the discipline, which expresses the main elements to address the physical-technical preparation of the athlete, based on the structural aspects of the discipline and the requirements profiles, arises as a resulting quality. That favors their development in the advanced initial specialization stage.

**The subsystem of manifestation of special physical development, have the function of achieving the transfer of physical-technical actions, based on the understanding of elementary requirements that allow to simulate the changing conditions of competitive activity, which requires the athlete to orient all your awareness towards the fundamental aspects to fulfill the objectives of the preparation. In essence for its development the following components are taken into account:**

a) Awareness of the need for the integration of training tasks. The athlete must understand the need to achieve the reproduction of his Technical-Sports skills backed by the development of the physical condition that he exhibits, therefore, it is necessary that taking into account the aforementioned aspects, he can integrate in the same training task, essentially technical, the development of the physical condition, all of which is known as the multipotence of physical exercise, while each task responds to a double pedagogical intention. In relation to the above the author A González 1997 when referring to the training of the corridor of 400 meters with fences raises that it is necessary to carry out works with double objective, on the one hand energy and on the other rhythmic, that is to say integrate works of capacity or lactic power with works of the rhythm of race in the test studied.

b) Awareness of the increase in the variability of specific actions. In this case the athlete must understand that the specialization in this discipline requires the improvement of modifiable habits, to solve the changing situations of competitive activity and it is necessary to incorporate various actions to solve problems from practical activities. Also, the author A Gonzales 1997 suggests some examples for the organization of training tasks where he states that if the intention is to improve the length of the step you should suggest to the runner, that in the same time (speed of competition) do less support, on the other hand if the goal is to develop the frequency, then in the same time (competition speed) will make more supports.

The self-regulation for the efficient use of special physical development as a resulting quality that results in the systematic presence and reproduction of specific reactions, in situations

that generate changes in the behavior of the child, arises from the coordination of the functions of the components that make up the described subsystem athlete according to the demands of the discipline.

**The subsystem disposition for the development of the special Physical-Technical condition, have as a function to manage the actions that favor the disposition for the development of the Physical-Technical condition, from an integrated and contextualized perspective. Among its elements it is important that the athlete manages to analyze the tasks of special Physical-Technical preparation and expresses its criteria in order to resolve the situations that may arise during the competitive activity.**

a) Prospecting of actions that favor the disposition for the development of the special Physical-Technical condition, reveals that the athlete must perform the detailed analysis of the situations that may arise in the activities that allow to simulate and model the conditions of the competitive activity It must also identify the possibilities of response and describe the actions it suggests, evaluating the fulfillment of the objectives and the Physical-Technical and psychological requirements, in this way you can plan the solution according to your individual particularities.

b) Determination of actions that favor the disposition for the development of the special Physical-Technical condition, should be implemented when developing the contents closely related to the conditions of the competitive activity, where the athlete's ability to respond to different situations is demonstrated that they can present themselves, their ability to adapt themselves, as well as to guide and direct their actions voluntarily to meet the objective.

The reproduction of physical-technical actions in changing conditions of competitive activity, will allow athletes, depending on weather conditions, the type of race, the state of readiness to compete and the sport form in which it is found as well as the number of the lane corresponding to it, among other aspects; choose the career option to be used as an element that integrates and demonstrates the development of specific technical-sports skills for athletes in this discipline.

The relationships that are established between the components that make up this subsystem emerge as a resulting quality self-management of knowledge for the development of the special Physical-Technical condition that have as purpose from the knowledge of athletes on the essential components for their physical preparation technical, achieve to offer criteria for its planning and execute actions that contribute to the improvement of the insufficiencies that they have, with an integral and contextualized character [22-24].

Thus, of the synergetic relationships established between the subsystems that make up the described model, it allows to

reveal as a new quality the specific disposition of the special physical-technical condition of the 400 meter corridor with fences, understood as the tendencies that manifest themselves in the athlete in relation to the physical-technical preparation, from the systematization of the tasks or training objectives, adapted to their individual particularities and based on the distinctive

features of the discipline, taking as an essential element the rational use of available time, which guarantees the efficient reproduction under changing conditions of competition and the manifestation of the development acquired in the preparation object of study, from an integrated perspective. The graphic representation of the model is shown below (Figure 1).

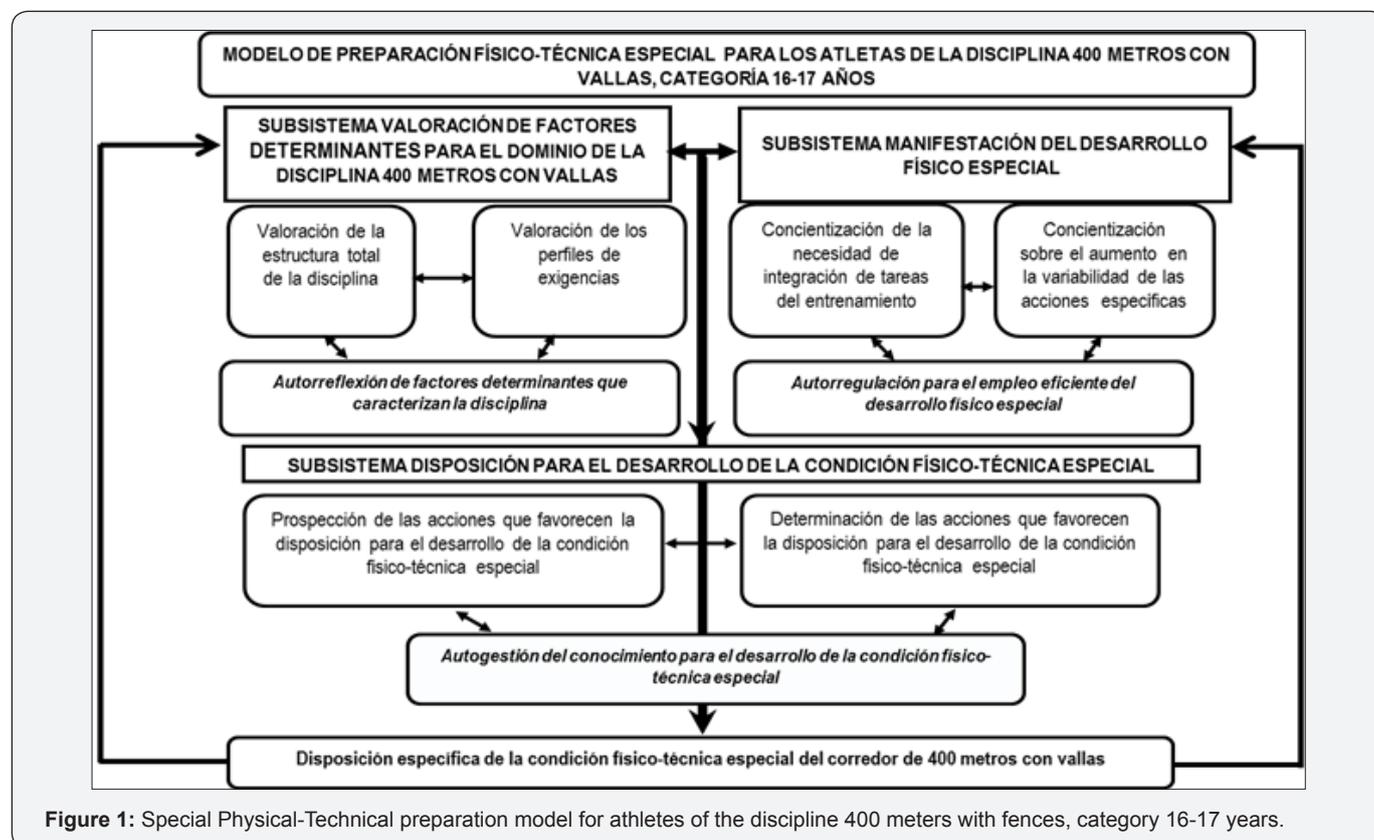


Figure 1: Special Physical-Technical preparation model for athletes of the discipline 400 meters with fences, category 16-17 years.

### Conclusion

- a) The model of Physical-Technical preparation for the discipline 400 meters with fences, category 16-17 years is based on the incorporation of a new mode of action for the planning, execution and control of the process, by means of integration of determining components in the sports performance.
- b) The model of Physical-Technical preparation proves its effectiveness in the results achieved, quantitatively and qualitatively superior to the initial state in which the coaches and athletes were due to the systematicity with which the tasks were executed.
- c) The results obtained from the evaluation of the experts, the application in practice and the results of the controls in the initial and final stages, are evidences that prove the positive effect of their implementation.

### References

1. García Manso JM (1998) Planning of sports training. Barcelona, Editions Martinez Rock.
2. Rius SJ (2005) Methodology and techniques of Athletics. Editorial Paidotribo, Spain.
3. Bovell C (2004) Sprint Hurdles.
4. Valle AD (2007) Some important models in pedagogical research. Havana, Cuba.
5. Platonov VN (1996) Adaptation to sports Barcelona. Ruis Sant (2<sup>nd</sup> Edn.); J Athletics Methodology, Barcelona.
6. Villalobos JR (2005) Methodology for the training of communication skills in standard offensive plays in football. ISCF Manuel Fajardo, PhD thesis in Physical Culture Sciences, Ciego de Avila, Cuba.
7. Dopico HM (2011) Psychopedagogical strategy of continuous training for coaches, aimed at the treatment of the psychological component in school athletes. UCCFD Manuel Fajardo, PhD thesis in Physical Culture Sciences, Havana, Cuba.
8. Godo E (2014) Educational strategy for the formation and development of intrapersonal self-knowledge skills in school boxers. PhD thesis in Physical Culture Sciences, Camaguey.
9. Font I (2014) Professional improvement strategy aimed at football coaches for the management of the psychological component. PhD thesis in Physical Culture Sciences, Camaguey, Cuba.
10. Álvarez de Zayas Carlos (1999) Didactics: The school in life. Editorial People and Education, Havana, Cuba.

11. Alvarez de Zayas CM, Lombardy SVM (1999) scientific research in the society of knowledge. Editorial Academy, Havana, Cuba.
12. Álvarez de Zayas CM (2000) Pedagogy as a science. Editorial Félix Varela, Havana, Cuba.
13. Bertalanffy LV (1956) General theory of the systems. Fund of Economic Culture, Mexico.
14. Betancourt ML, Quintana DUL, Lombard HÁA (1991) Athletics in the school and sports environment. Editorial Pueblo and Education, City of Havana, Cuba.
15. Blázquez SD (1999) Sports initiation and school sports. Editorial Zaragoza, Spain.
16. Bravo J (1996) Athletics (I): Racing and March. Spanish Olympic Committee, Madrid, Spain.
17. Boyd R (2008) Components of the 400 m hurdles.
18. Bruce L (1995) Training methodology and technique for the 400 m hurdles.
19. Cáceres J (2004) Félix Sánchez: I run with RD in the mind.
20. Campistrous PL, Rizo CC (2005) Indicators and educational research. Central Institute of Pedagogical Sciences, Cuba.
21. García F (2004) Psychological tools for coaches and athletes. Havana, Cuba.
22. Easter M (1997) The 400m with fences. Notes of the Conference. Current situation technique and training. Barcelona.
23. Easter M (1997) Notebooks of Athletics. Royal Spanish Federation of Athletics, Madrid, Spain.
24. Ruiz SJI (2011) Gnoseological foundations of the race pace in the specialty 400 meters with fences.



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