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Methodology for the improvement of the tactical technical action of baseball pitchers

Metodología para el perfeccionamiento del accionar técnico táctico de los lanzadores de béisbol

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ABSTRACT

The technical tactical action of baseball pitchers requires the search for new tools that are derived in a pedagogical context that creatively manages the forms of knowledge, in line with this, the methodologies used in baseball demand a continuous updating in the theoretical, methodological and practical order. Hence, the objective of the present research was to develop a methodology for improving the tactical technical action of baseball pitchers in correspondence with the function they perform within the game. In order to do this, we worked with a primary sample of 15 pitchers from the Pinar del Río team, in the last year of the 17-18 category, as well as a secondary sample of 12 coaches, 20 specialists and 20 athletes who regularly or occasionally enter as pitchers. Scientific research methods and techniques such as document analysis, observation, standardized and individual interviews and expert judgment were used. There were shortcomings in the treatment of the contents of the tactical technical preparation for improving the actions of the baseball pitcher according to the role played in the game, from which a methodology is proposed that contains the structure, content and planning of the technical-tactical preparation of baseball pitchers, according to their function in the game, from simplified situations that didactically act on the components of this sports preparation and under laws and principles of sports training.

Key words: tactical technical action; pitcher function; pitchers; methodology.

RESUMEN

El accionar técnico táctico de los lanzadores de béisbol exige la búsqueda de herramientas novedosas que se deriven en un contexto pedagógico que gestione, de manera creativa, las formas del conocimiento; a tono con esto, las metodologías actuantes en béisbol reclaman una continua actualización en el orden teórico, metodológico y práctico. De ahí que la presente investigación tuvo por objetivo elaborar una metodología para el perfeccionamiento del accionar técnico-táctico de los lanzadores de béisbol, en correspondencia con la función que desempeñan dentro del juego. Para ello se trabajó con una muestra primaria de 15 lanzadores del equipo Pinar del Río, en el último año de la categoría 17-18, así como una muestra secundaria de 12 entrenadores, 20 especialistas y 20 atletas que incursionan regular u ocasionalmente como lanzadores. Se emplearon métodos y técnicas científicas de investigación como el análisis de documentos, la observación, la entrevista estandarizada e individual y el criterio de expertos. Se constataron carencias en el tratamiento del contenido de la preparación técnico-táctica para el perfeccionamiento del accionar del lanzador de béisbol, según la función que desempeña en el juego, a partir de la cual se propone una metodología que contiene la estructura, contenido y planificación de la preparación técnica-táctica de los lanzadores de béisbol, según su función en el juego, a partir de situaciones simplificadas que didácticamente actúan sobre los componentes de esta preparación deportiva y bajo leyes y principios del entrenamiento deportivo.

Palabras clave: accionar técnico táctico, funciones del lanzador, lanzadores, metodología.

INTRODUCTION

At present, the search for solutions to achieve the improvement of the technical-tactical preparation, within the process of sports training, has taken off, since it has become the fundamental axis of the sports preparation, in sports of cooperation-opposition by the growing search of the sports mastery, which is manifested in the prioritization of designs of the content of the preparation with technical-tactical approaches. González, Iglesias, Mirallas and Esparza, (2011); Copello, (2013); Morales-Cuellar, (2014); Calero, S. (2015); Guillén, (2015).

Baseball is a collective, team sport with a variable character and contextualized within the group of "sports with balls". Martín and Deler, (2009). Their game, in a general sense, is distinguished by the use of force on the offensive and the little use of speed in tactical combinations between the batter and the runners, offensive and defensive plays based on traditional tactical schemes. Arévalo, C. and González, Y., (2016).

The increase of the number of countries that practice it, the increase of complex and dynamic forms of playing, the modifications of the regulation and the participation of professionals together with amateurs in the fundamental competitions, imply substantial transformations in the methodologies of the training of the baseball player, which can be achieved to a great extent by means of the processes of the sport training, mainly of those associated to the technical-tactical preparation. This, as one of the main directions of the sport training, fulfills essential functions in the formation of the habits and abilities proper to the sport. Calero, S. (2015).

From the observation of training sessions of the category 17-18 years old, marked flaws were detected in the teaching-learning process of the technical-tactical preparation because it is based, basically, on traditional conceptions that distort the contemporary approaches, attributed to a strong resistance to change or to the lack of knowledge of new and innovative alternatives that allow to reformulate the predominance of the directivity in the teaching, the limited contextualization and the preponderant role and encyclopedista of the trainer that attributes to this preparation a mechanistic character. Copello, (2013); Morales-Cuellar, (2014); Guillén, (2015); Guillén, Rosero and Ale, (2016). Under this premise, the technical-tactical preparation requires the use of methodological tools that contribute to the players actively participate in the understanding of tactical problems and improve, in the same way, the competitive actions.

This enriches the technical possibilities and the individual tactical evolution, where the interrelation of the technical-tactical action and its combinations when training, allow the player to understand them and to develop the motor potential by the experience and the ideas captured for a fast competitive participation. Cárdenas and others, (2019).

All this is subordinated to the intention of the formation of an intelligent, analytical, creative pitcher, with high technical and tactical level efficient, before the varied situations that derive, according to their function in the game.

In this order, the need to manage a cognitive resignification towards the treatment of psychopedagogical elements by the coach, conditioning them to new knowledge, skills and the process of knowledge transformation that arises as part of the dynamics of the process, becomes valuable. Nieves and Martínez, (2012).

In spite of the multiplicity of alternatives, it has not yet been possible to propose solutions that focus, in an objective way, on the formation and development of the preparation, in such a way that the directions of the preparation for the technical-tactical component, the methods, tendencies, procedures, contextualization elements for teaching, among others, are clear; therefore, knowledge is diluted in front of the need to make it concrete in practice.

However, one of the main reasons that hinder the programming of technical-tactical training in baseball, particularly in the area of pitchers, is precisely in the planning of the technical volume, to the detriment of tactics, which limits the application of resources that must be implemented according to the situations that, on each occasion, face the pitcher, according to his function in the game.

At this point, Guillén et al. (2017), stress that the basic training process must be highly influenced by the directions of preparation and the content attributed to them, express the pertinence of the use of a cognitivist model of transference, which gives the possibility of articulating, in a logical way, technique and tactics, hence the idea that technique cannot be seen outside tactics, in ball sports, specifically in baseball.

Thus, from the tactical point of view, it coincides with the criteria of several authors such as, Copello (2013); Morales-Cuellar, (2014); Guillén, and Coral, (2017), which allude to tactical offensive direction, tactical defensive direction and tactical direction of combined or continued actions (simplified game situations); Similarly, Guillen, when referring to the psychological component, indicates that the content of psychological direction must be oriented towards the perception and differentiation of situations, towards the decision making and development of the operativity of

operative thought, towards the development of the optimal mood disposition to create and solve, towards the development of the motivational climate of tension and frustration and towards the development of the volitional component. Guillén, et al., (2017)

In this sense, authors such as Salas and Ardanza (1995) consider that simulation (simplified game situations) consists of placing an individual in a context that imitates some aspect of reality and in establishing, in that environment, problemáticas or reproductivas situations, similar to those that he will have to face.

From observations of games, of the 52 National Series, it was appreciated that the players, with more difficulty in the preparation previously mentioned, were the athletes between 19 and 21 years of age, reason why when examining the inferior category (17-18 years) training sessions and preparation games were proceeded to observe and it was verified, by means of interviews with coaches, that the technical-tactical preparation, specifically the technical-tactical action of the pitchers, according to the function that they carried out, was inadequate and directly influenced their sports performance.

An exploratory study was applied to the area of pitchers, where it was observed that, in their technical-tactical actions, there are limitations with respect to the useful tools for an adequate performance to successfully face the opposing batters.

Consequently, with the above, the general objective of this research was focused on developing a methodology for improving the technical and tactical actions of baseball pitchers, in accordance with the function they perform within the game.

MATERIALS AND METHODS

Research methods and techniques

The methods and techniques of scientific research, in this work, are sustained in the materialistic-dialectical method as a fundamental theoretical-methodological base for the interpretation of the objective reality of the training of the technical-tactical preparation in baseball. In addition to the methods of the theoretical order, the following were used:

Analysis of documents: it allowed the study of antecedents related to the technical-tactical training of the baseball pitchers, from the analysis of the governing document of baseball in Cuba, the Integral Program of Preparation of the Sportsman in its editions 2009, 2011, 2013 and of the Olympic cycle 2016-2020 (Collective of authors, (2009, 2011, 2013 and 2016-2020). The analysis carried out took into account: the contents for the development of the technical-tactical preparation of the pitchers; the dosage and distribution of the volumes of the technical-tactical preparation of the pitchers in the macro-cycle of preparation; the methods for the development of the technical-tactical preparation of the pitchers, as well as the organizational procedures, used for the development of the technical-tactical preparation of the pitchers.

Interview: it was applied to 12 coaches of pitchers of the category 17-18 years, who average, in this work, 17 years of experience, with the purpose of knowing their

criteria on the development of the methodological treatment in the process of technical-tactical preparation of the baseball pitchers, as well as to know their experience in the implementation of the technical-tactical preparation. This interview was structured in a questionnaire of five complementary and fundamental questions.

Non-participating observation: the observation was made to 30 training sessions in the preparatory period and 16 confrontation games in the competitive period, with the purpose of knowing the line of work followed in the technical-tactical training carried out by the coaches. Among the aspects valued by the pitchers are: the number of times they mark the first strike; the time it takes to make the next send; the location of the pitcher on the throwing board; the relationship between the number of pitches and innings thrown; the number of positive connections of the batter in counts favorable to the pitcher; the displacement for the assists and their placement.

The system approach was used to determine the components of the methodology and the relationships between them, the structure and hierarchy of each component was determined, as well as its dynamics and functioning.

Expert criteria: for the theoretical evaluation of the proposed methodology, a group of experts was formed, integrated by 20 experts of recognized authority and suitability with respect to the subject. The following requirements were adopted as selection criteria:

- To have a degree in Physical Culture.
- To have a high competence coefficient in the subject in question.
- Adequate academic level, related to the profile of the work.
- Accumulate more than 10 years linked to the activity.
- Be willing to participate in research.

In the processing of the obtained data, the statistical package SPSS version 21.0 was used, the arithmetic mean, the proportion expressed in percent, frequency distribution tables, the nonparametric statistical test of correlation coefficient Kendall to determine the degree of concordance in the critical valuations, emitted by the specialists.

RESULTS AND DISCUSSION

In order to fulfill the proposed objective and to be able to conform the methodology to propose, an exploration of the current state of the technical-tactical action of the baseball pitchers, category 17-18 years in the province, was carried out based on the methods and instruments foreseen, whose main results are described below:

Analysis of documents

When analyzing the normative document that governs the sports preparation of baseball players in Cuba, specifically the pitchers of the Programa de Preparación Integral del Deportista (PPID) it can be seen that the indications related to the technical-tactical preparation incline in favor of the acquisition of the motor habit, and in less attention the cognitive aspect. The cognitive aspect lacks spaces in sports preparation and should foster cognitive conflicts that encourage a rational understanding of procedures in technical-tactical actions; furthermore,

methodological tools that contribute to eradicating the difficulties indicated are not appreciated.

Another document analyzed, used in an alternative manner and suggested by the technical-methodological department of the Cuban Baseball Federation (FCB), is the Tactical Significance Training Model for Team Sports: Reynaldo Baseball, F. (2016); it shows a different approach to this process since it proposes as its main objective the teaching oriented towards the tactical significance of the baseball player's training, based on the application of changing and unexpected situations that arise in the game, open to its solution.

The consideration of the simplified situations of the game, inserted in the Program of Integral Preparation of the Athlete. Collective of authors (2016-2020), as one of the few pedagogical procedures carried out in baseball and specifically in the area of pitchers, implies that these athletes learn by means of active and exploratory confrontation with the real environment of the game, that they limit themselves to receiving information and to reproducing performances conducive to repetitive and mechanistic learning.

This limits the establishment of relationships with previous knowledge, causes new knowledge to be linked, in a superficial manner and without modifying previous knowledge, which is why pitchers learn to solve problems without the necessary understanding, and even, the tendency that can be seen is that of directing the coach the motor execution of the athlete (pitcher) to respond to the given situation, which hinders the active development of the athlete's psyche in the face of a tactical problem to be faced. From this, it can be seen that the methodological procedure, which is oriented towards the treatment of the technical-tactical content of category 17-18 launchers, manifests itself with a marked orientation towards the acquisition of motor habits and is expressed in the repetitive exercise that characterises it. The methodological sequence that is proposed tends only to the materialization of the actions, according to the present context, created by the teacher, which leaves aside the interiorization of the actions, creativity and independence of the launcher as a means to promote the integration of the procedures involved in the technical-tactical actions and the development of habits and motor skills that contribute to the development of an intelligent, creative launcher, who contributes, independently, quick and adequate solutions to the problémicas situations that are presented to him in the training and competition.

Results of the interview with the coaches

The general analysis of the coaches' responses yielded the following elements:

- The 100 % of the interviewees consider the methodological guidelines provided by the PPID on the technical and tactical preparation of the pitchers to be imprecise and insufficient; they also express that they rely basically on their personal experiences.
- The 83 % do not consider the personalization of the technical and tactical preparation of the pitcher to be of paramount importance, according to the function he fulfills in the group of pitchers, in this category.
- The 75 % of the coaches interviewed show a lack of knowledge of the tactical systems most used today, so tactical training of pitchers is limited in this aspect.
- The 100 % of the interviewees are limited to the use of means such as bullpen and simplified game situations, present in the PPID, which show a clear

tendency to prioritize the motor aspect, to the detriment of the cognitive aspect.

- The 100 % of the interviewees agree that a methodological tool structured by means, methods, procedures and precise methodological orientations, which allows the appropriation of habits and abilities to the pitcher for the solution of technical-tactical tasks in conditions similar to the game, in a creative, developing and independent way, would be very useful.

Results of observations to trainings in the preparatory period

- In evaluating the results of the 30 observations made during the training sessions, the following shortcomings were noted during the preparatory period for baseball pitchers in the 17-18 year-old category of the EIDE Ormani Arenado, in Pinar del Río:
- Limited use of the table to throw what conditions difficulties in the location and commands of the shipments according to the weaknesses of the opponent.
- Vulnerability in the action of launching thus in 90% of the shipments were seated far from the batter.
- Lacks in the launch commands because in 60.5% of the shipments made the bullpen was located in the strip of greater contact of the strike zone.
- Predominance of the repetitive method starting from exercises of schematic and mechanistic character, unable to produce positive transfers that achieve the appropriate effect in the thought of the launcher.
- Insufficient construction of unexpected actions to activate the operational thought of the launchers in order to awaken the autonomy and decision making of those involved.
- Lack of didactic aids that contribute to the strengthening of the theoretical component of the athlete's technical-tactical preparation.
- The technical-tactical preparation according to the function of the pitcher in the collective of pitchers is not detailed.
- Deficient operativity of the general thought of the pitchers.
- Deficiencies in the theoretical-tactical knowledge of the pitchers according to the function they play in the game.

Results of observations to confrontation games

- For its part, the control carried out on the 16 confrontation games, included in the mesocycles, special and precompetitive (sports performance modeling and sports performance adjustment), yielded the following:
- Deficiencies of the pitchers are evidenced at the time of marking the first strike.
- Limited use of the throwing table that conditions difficulties in the location and commands of the shipments according to the weaknesses of the opponent.
- Shortcomings in the independence and decision making of the pitchers during their performance in the game.
- Insufficiencies are noted in the use of tactical throwing systems, according to the physical, technical and psychological characteristics of the opposing batters.
- It is observed that in 70 % of the occasions, the relief pitchers did not fulfill the task of dominating the batter they faced at the beginning of their performance.
- It is deficient the frequency that is established between launching and launching, on the part of the pitcher.

In a general sense, the results of the observations of the preparatory and competitive periods, the interview of coaches and the documentary analysis of the Program of Integral Preparation of the Sportsman (PPID), reflect that the orientations of the normative documents that govern baseball in the country have gone through a process of irregularities, so that the categories, objective, content, dosage, method and control, have been treated in an irregular and inadequate way; this situation has influenced the unfavorable technical-tactical action of the pitchers, according to the function that they perform in the collective of pitchers, according to the function that they perform in the collective of pitchers.

Methodology for the improvement of the technical-tactical action of baseball pitchers

Once the results of the applied instruments had been processed and analyzed, the methodology was designed to improve the technical-tactical actions of baseball pitchers, according to the function they perform in the group of pitchers, based on the use of the systemic-structural-functional method, which allowed the structure, the elements, their interrelation and functioning to be established. In the design of the methodology, the methodological steps guided by De Armas, N. and others, are assumed (2003).

The theoretical, methodological and scientific foundations of the proposed methodology respond to the need and social commitment that baseball has in the Cuban sports system and the demands of the current sports universe, which lies in making possible the goals of the sports institution with the interests of Cuban society, which requires novel ways in the individual action of technical-tactical preparation in the national sport, specifically in pitchers, since the solution of current problems in this area will only be possible with the intervention in the process of sports training to gradually transform it.

The general objective of the methodology is to perfect the technical and tactical actions of baseball pitchers, according to their function in the game, through the methodological treatment of the inherent elements of the preparation under study. In addition, a particular objective, framed in favoring the integral development of technical and tactical abilities in harmony with the theoretical knowledge and the physical and volitional possibilities that contribute to the systematic growth of the baseball pitcher.

In structuring it, the knowledge system of the pedagogical sciences and the current state of knowledge about the technical-tactical action of baseball pitchers were taken into account, starting from the fact that man is the result of his time and the product of the relationships he establishes with other men. As a result of this reasoning, its pedagogical foundation is based on the criteria of Ruiz, (2010), who reveals that: the particularities of the teaching-learning process that are manifested in sports training, which is defined as a pedagogical process of preparation of the human organism to intense physical and psychic efforts, directed, developed and graduated in a systematic and continuous way, in order to obtain high competitive performances in a given sport. (p.7).

The proposed methodology considers the need for a flexible and comprehensive methodological tool which can be contextualized according to the level of the athletes and the objectives that the trainer sets in his training structure, enabling the

systematization within the preparation process of each of the steps that compose it. (Figure 1).

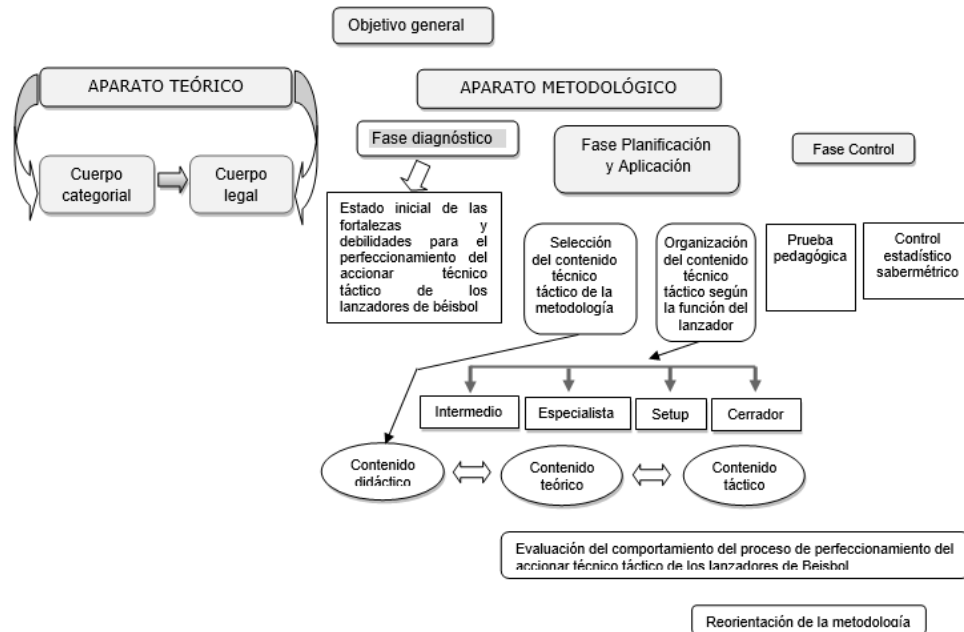


Fig. 1. - Synthesized representation of the methodology for the improvement of the technical-tactical action of the baseball pitcher

Its conception expresses the close relationship that must be manifested between the elements that influence the preparation of the athlete, starting from the objective reality and the characteristics of the sport. Therefore, it is necessary that in the process of technical-tactical preparation a dialectical interrelationship is established between training and competition, revealing the integral preparation of the athlete so that he is able to react or respond, in an adequate way, to the intense emotional rhythms that may arise during his performance on the playing field.

The proposed methodology starts from identifying the pitchers, with their needs and potentialities, conceiving their participation, from different game situations, which represent the object of study.

In this way, the pitcher achieves cognitive independence and the assessment of how to use the theoretical-tactical knowledge, showing full understanding of the technical-tactical solutions it provides, according to the context of the game. The theoretical apparatus includes the categorial body and the legal body. (Figure 2).

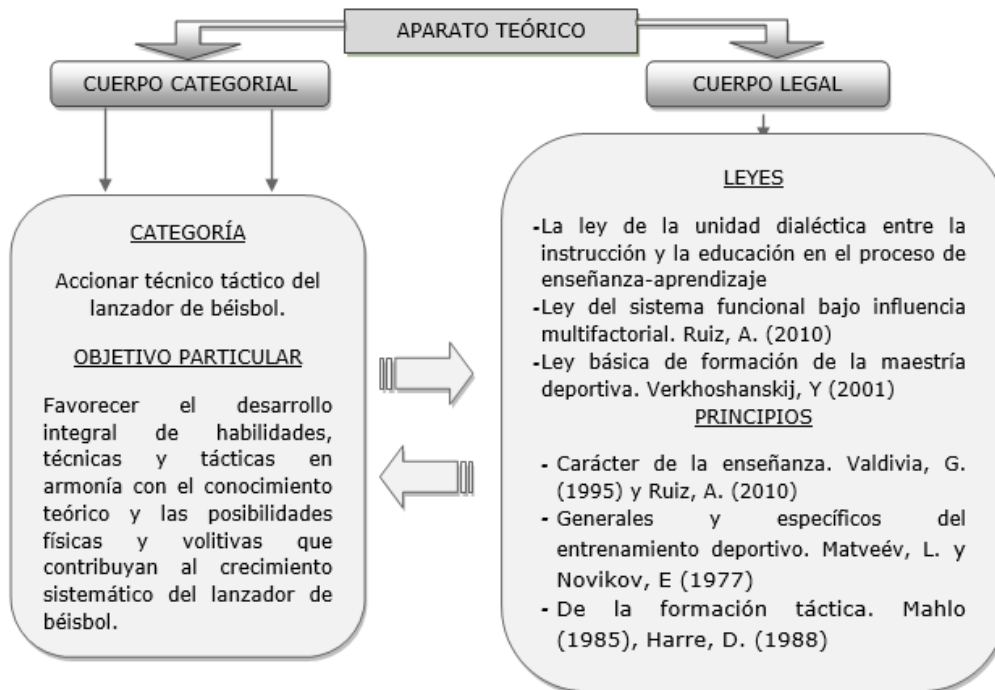


Fig. 2. - Scheme of the theoretical body of the methodology for the improvement of the technical-tactical action of baseball pitchers

For its part, the methodological or instrumental apparatus reveals its functionality through the transit through three phases with their specific actions. This provides the means for its definition in practice, containing theoretical and methodological aspects of the didactics of sports training, as well as the content of the stages, procedures, methods and means and their respective methodological recommendations that reveal how it operates, through the conceptual scheme, the methodology for perfecting the technical-tactical actions of baseball pitchers. (Figure 3).

In this sense, the diagnosis allows to identify the initial state of the pitcher to face, according to the function he performs, the process indicated on the basis of its results; in the planning the selection and ordering of the contents addressed in the preparation takes place; consequently, during the application, the process of improvement of the technical-tactical action is produced, starting from the integrated methodological treatment of the preparation, according to the function he performs in the group of pitchers and the game. With the phase of *control and feedback*, the level reached in the process of improvement of the technical-tactical action of the pitcher is verified through the dimensions and indicators that are declared in accordance with the technical-tactical performance reached according to the work they perform in the game; this makes possible the readjustment of the methodology depending on the insufficiencies or weaknesses determined as a result of the competitive process and gives continuity to the required sports improvement, according to the new zone of current development.

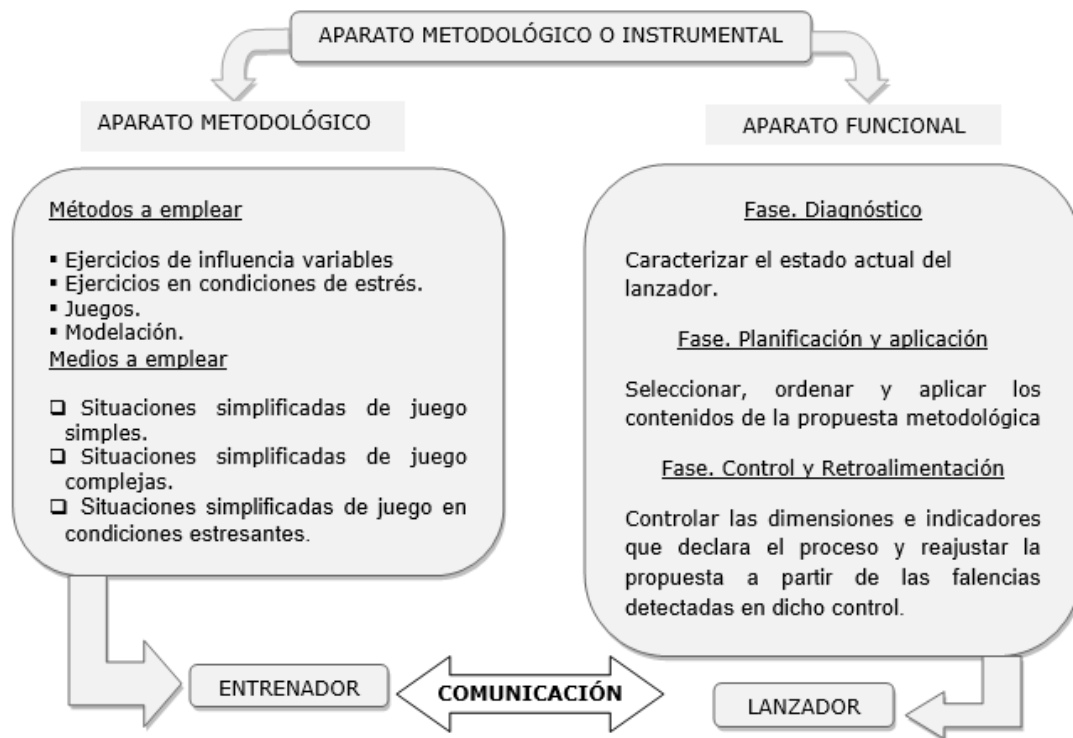


Fig. 3. - Scheme of the methodological or instrumental apparatus of the methodology for the improvement of the technical-tactical action of baseball pitchers

Selection of the technical-tactical content

As a novel element, the contents of the methodological proposal are planned according to the function developed by each pitcher in the game, revealing the general principles of sports training. Matvéev, L. and Novikov, E., (1977). (Table 1; Figure 4).

Simplified game situations, as a didactic procedure for perfecting the technical-tactical actions of baseball pitchers, begin with tasks of less difficulty and less effort, which will gradually increase as more complex ones are incorporated. The education of volitional efforts through this didactic resource with tasks that include obstacles, risks, complicated situations and stressful conditions, variety of schedules, conditions of the playing fields and varied levels of demand, favor the development of volitional qualities and aspects of sports psychology such as self-control, anticipation, observation, perception and decision making, all with the integration of theoretical and methodological contents.

Table 1. - Contents for the improvement of the tactical technical action of baseball pitchers

Didactic content	Theoretical content	Tactical content
Simplified simple game situations (S-s-s)	Offensive power zone according to batter's physical characteristics	Descending latching system (SPds)
Simplified complex game situations (S-s-c)	Offensive power zone according to batter's posture	Ascending latching system (SPas)
Simplified complex game situations In stressing conditions (S-s-e)	Offensive power zone according the batter placement.	Alternating latching system (SPal)

Qualitative solutions must be sought that guarantee sustainable development hierarchically, that is, regulated access to sports preparation for the baseball pitchers present in the sample, because in accordance with this condition we must not overburden the athlete with excess content without establishing a didactic articulation of time, in line with the improvement of the technical and tactical actions of baseball pitchers.

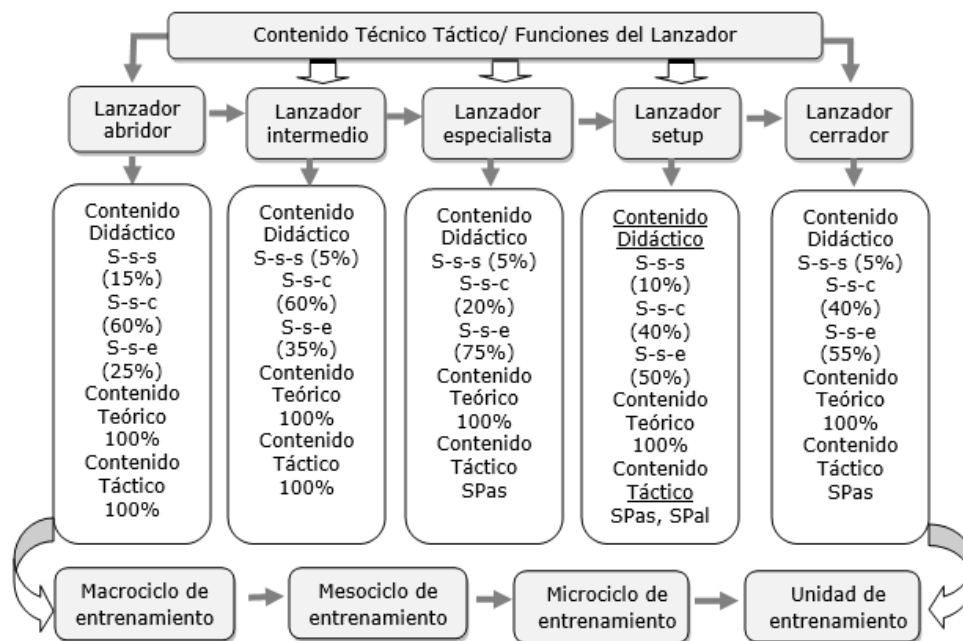


Fig. 4. - Scheme of planning of the technical-tactical content for the improvement of the technical-tactical action of baseball pitchers, according to the function they perform in the game

Methodological treatment requirements in the application phase

- To maintain the facilitating role of the teacher in conducting the methodological treatment in terms of the technical-tactical content of the methodology, enhancing the trainer-pitcher binomial.
- The didactic content of the methodology must have a favourable effect on the creative activity of the athlete.
- To temper the problems to solve with the particularities of the pitchers, starting from solutions, according to the individual technical-tactical resource and its function in the collective of pitchers.
- The shipments of the baseball pitchers are dosed in correspondence with the volumes planned for each preparatory period and the role they play in the collective of pitchers.
- To demand and motivate the pitchers to the correct execution of the technical and tactical actions in training and games.
- Extend the methodological treatment to the context of games, where, according to the modality used, the teacher raises the problematic situation or the game itself raises the situations to the pitchers under the guidance of the teacher.

Control and feedback phase

In this important phase, the level of understanding of the procedures involved in the technical-tactical preparation of the pitcher, the development of technical-tactical skills and their technical-tactical action is determined according to the function it performs in the game through the WHIP (percentage of packages), QS (quality opening), PCL (average of clean races), HLD (preserved advantage) and SV (saved game). (Figure 5).

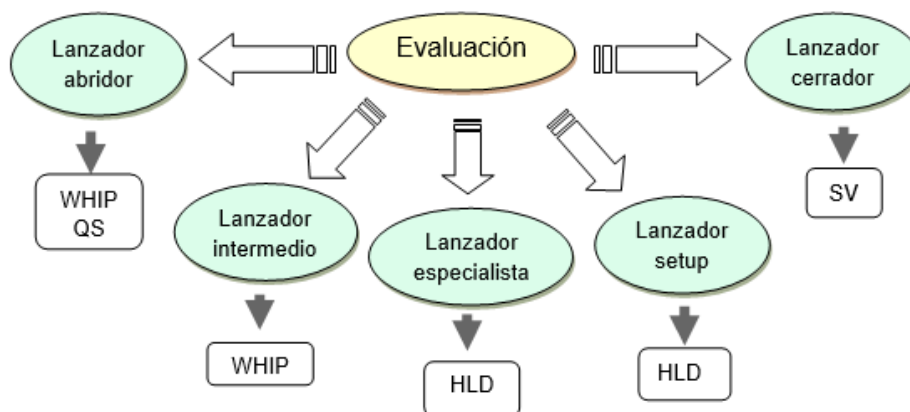


Fig. 5. - Diagram of the control in the process of perfecting the technical and tactical actions of the pitcher according to his function in the pitching staff

From the evaluation, it is possible to obtain adequate feedback on the effectiveness of the methodological resources used to improve the technical and tactical actions of baseball pitchers, to readjust the preparation by considering the integrality in terms of dimensions and controlled indicators, the methods and instruments used.

Assessing the methodology for perfecting the technical-tactical action of baseball pitchers through the criteria of experts

After configuring the methodology with all its elements, we proceeded to submit it to the evaluation criteria of the group of experts previously selected so that, based on their opinions on the technical and tactical actions of baseball pitchers, according to the function they perform in the game, we could discriminate the essential elements of composition, in order to perfect the elaborated methodology.

For the application of the criterion method of experts, the following stages were established: elaboration of the objective, selection of the experts, choice of the methodology, application of the selected methodology and processing of the information obtained. In the first stage, the objective was determined as follows: to evaluate the methodology elaborated according to the criteria of theoretical-methodological coherence and its degree of applicability in the process of technical-tactical preparation, in the technical-tactical action of the baseball pitcher, according to the function that this plays in the group of pitchers.

The systematic and individual evaluation of the methodology by the 20 experts in the foreseen attributes allowed determining the consensus among them, through the Kendall concordance coefficient; in this sense, there is agreement that attribute 1 is quite adequate, as well as attributes 2, 4, 7 and 8; on the other hand, attributes 3, 5 and 6 were evaluated as very adequate. (Table 2).

Table 2. - Tabulation of the results of the specialists' criteria

Atributos	C4 Very adequated	C3 Fairly adequate	C2 Adequate	C1 Little adequate	C0 No adequated	Totals
1	8	12	0	0	0	20
2	9	11	0	0	0	20
3	18	2	0	0	0	20
4	7	13	0	0	0	20
5	18	2	0	0	0	20
6	16	4	0	0	0	20
7	8	12	0	0	0	20
8	5	15	0	0	0	20

The cut-off points obtained, which represent the critical values that define the boundary between each of the five categories that were used to assess the proposed methodology, reflect evaluations between the categories of very adequate and quite adequate, in a range between -0.32 and 3.72. The cut-off points obtained, which represent the critical values that define the boundary between each of the five categories that were used to assess the proposed methodology, reflect evaluations between the categories of very adequate and quite adequate, in a range between -

0.32 and 3.72. This result expresses a fairly adequate level of satisfaction, which allows us to consider that the definitive application of the methodology is feasible.

The suggestions of the experts in the first cut were considered in order to use data that reveal the technical-tactical action of the launcher before the different types of batters since, in their opinion, they offer a greater vision of the technical-tactical performance of the launchers; The experts agree in enriching the theoretical content of the methodology, in order to extend to other contexts in which the work of the baseball pitcher is developed, and they were in favor of the didactic-methodological brochure of help, designed to improve and deepen the knowledge in a subject as pertinent as the technical-tactical action of the baseball pitchers, according to the function it plays in the game.

The diagnosis developed in the research showed deficiencies in the treatment of the content of the technical-tactical preparation for the improvement of the action of the baseball pitcher, according to the function he plays in the game; these prevent him from meeting the current demands for the technical-tactical performance and sports performance of this player.

Based on the above, the proposed methodology reveals the structure, content and planning of the technical-tactical preparation of baseball pitchers, according to their function in the game, from simplified situations that didactically act on the components of this sports preparation, under laws and principles of sports training.

For this reason, the inconsistencies that, from the epistemological and praxiological profiles, have affected the training process of technical-tactical preparation, specifically in the area of pitchers, justifies the opening of new investigations where the categories: objective, content, dosage, method and control are integrated, with systemic character and attention to the individual component; the specific characteristics of the functions in the area of pitchers are also considered, where the process of technical-tactical preparation of the same, according to their function in the game, reaches a superior quality.

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