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TRAINING PROGRAM FOR THE IMPROVEMENT OF THE PHYSICAL ABILITIES OF CHILDREN BETWEEN 8-10 YEARS OF AGE OF THE TENNIS FEDERATION OF THE SAN JACINTO HEADQUARTERS

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ABSTRACT

Introduction: the work presented was carried out in the first semester of 2020, in grassroots tennis with the 8-10 years old category, with the tests of the physical capacities that children must have in the sport of tennis. General objective: To identify the effects of a training program to improve aerobic endurance and reaction speed in children aged 8-10 years from the tennis federation, San Jacinto campus. Methodology: The database review identifies 31 articles correlated with the topic under study in the databases of: Scopus (15), Google Scholar (16), which were accepted, and of which, there are fourteen (14) that are identified as 14 functional articles, because they present significant contributions to the project. It is an "experimental explanatory" research study, with a quasi-experimental design, developed longitudinally, prospective and with a mixed approach. Results: A comparison was made from the first tests to the last ones carried out, where positive changes were evidenced in the athletes in the capacities of Aerobic Endurance and Reaction Speed. Conclusion: with strength training applied for 12 weeks, great changes in physical capacities such as speed and endurance are obtained.

Key Words: Reaction Speed. Aerobic Resistance. Base Tennis. Physical Preparation.

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INTRODUCTION

Grassroots tennis is the practice of sport in children, youth, amateur. This type of tennis plays at a level of technical-tactical preparation with an emphasis on physical abilities. It is not part of professional or elite tennis, this project focuses on the measurement of the variables of all the physical capacities of the players who are in the host tennis federation: "San Jacinto", in order to establish a 12-week training program, with its respective accompaniment of the practice of the players of the base tennis category.

The "San Jacinto" headquarters tennis federation: provides with the appropriate spaces and material for the realization of the project, the federation in its style of play requires that the players have an adequate and relevant level in aerobic endurance, also, it is required that the players have a reaction speed for the functions they require in the competition, that is why the research will seek to improve these physical capacities of the players of the host tennis federation: "San Jacinto" and to follow up with both tournaments and class sessions.

The review of the databases determined a total of 31 articles correlated with the topic: These databases are the following: Scopus (15), Google Scholar (16), of these fourteen (14) were accepted as functional articles, because they provide significant information for the <Practice 1> project, all dedicated to the improvement of aerobic endurance and reaction speed in young athletes. It is an "experimental explanatory" research study, with a quasi-experimental design, developed longitudinally, prospective and with a mixed approach.

Population that benefits: This training plan seeks to improve the physical capacities of aerobic endurance and reaction speed of athletes aged 8-10 years of the host tennis federation: "San Jacinto".

Expected results: With the research it is projected that, by applying the 12 weeks of training, aerobic endurance capacities and reaction speed will be improved to optimize the sports performance of the players, which will be applied to the proposal of 12 weeks of training.

Study population: The group under study for the research project is selected based on the objective proposed for <Practice 1> and for those who are most beneficial in motor development, likewise, the participation of the athlete will be taken into account, through their ability to comply with everything established by: The Host Tennis Federation: San Jacinto".

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BACKGROUND

For the background of this research, within the bibliography review carried out in different databases, a large number of articles have not been found at the local, regional, national level, while at the international level 14 research articles were found functional, which were found respectively in: Google Scholar and Scopus.

Speed is the ability to execute a movement in a minimum time and perform the greatest number of movements in the shortest possible time (Le Deuff, 2003). Vila (1999) defines it as the maximum possible speed in the execution of movements under voluntary control.

Speed training in tennis aims to: increase the frequency and amplitude of strides. It allows to improve the coordination of movements during an anaerobic effort that quickly depletes the available energy. This is very important in tennis, because coordination is a key element of effectiveness in this activity (Le Deuff, 2003). Ortiz (2004) is in the same vein, because he considers that the most important factors in tennis are: speed of feet, lateral advances and, above all, agility, understood as the ability to move at maximum speed making changes of direction (Therminarias, 1998). Kovacs (2006), on the other hand, considers that tennis players need to have a fast reaction speed, and an explosive speed in the "first step". In addition, it has a high speed in linear, lateral and multidirectional movements.

In tennis in particular, speed is determined, in the words of Le Deuff (2003), by three parameters: 1.- Reaction time (link to the acquisition of information and decision on quality), 2.- Speed of movement (rapid chain of runs) and 3.- Duration of execution (gestural organization).

Most studies examining the relationship between energy recovery and aerobic capacities suggest that better aerobic endurance increases recovery capacity during intermittent high-intensity exercise, increasing phosphocreatine resynthesis (Tomlin & Wenger, 2001). However, endurance training in tennis does not require a maximum development of aerobic capacities as required by cyclical individual endurance sports, but must be developed in such a way as to allow the optimal support of competition and training loads. In some cases, training methods from cyclical sports have been used, they have been carried out in environments far from the tennis court or relevant aspects of the sport such as its physiological profile, the intermittent and variable nature of the game or specific muscle involvement have not been respected.

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Exposed to the articles analyzed by the researcher, it is reflected that in Colombia not enough importance has been given to the issue of aerobic endurance and reaction speed, that is why it seeks to benefit this category of the tennis federation: San Jacinto Headquarters, through an already established schedule that seeks to improve and contribute, for the enrichment of the talented young people of said headquarters, as a team that stands out for its excellent results at the municipal and departmental levels.

It seeks to improve the physical capabilities of the athletes of the tennis federation of the San Jacinto headquarters, because, at these ages, the physical part can be worked on in an adequate way, carrying out workloads that generate an adaptation in the athletes, thus, in this way, their performance in the tournaments next to be played by the category, When monitoring them, criteria can be established, in which their sports performance will benefit in the future.

What we want to do with this research is to generate a significant change in the tennis venue through several tools such as technology as a means of monitoring protocol suitable for evaluating various procedures that are being carried out in the 8-10 year old category. Therefore, a combination of continuous training, interval training, sport-specific exercises (Suárez, D., 2015), is recommended for the improvement of aerobic endurance capacity, while for reaction speed, training with agility exercises, through runs with changes of pace and direction in a small space (Berdejo del Fresno, D. and González, J., 2009).

This research is carried out in order to improve and strengthen the physical capacities of athletes in the 8-10 years old category, of the tennis federation at the San Jacinto headquarters in its respective sports space with different works aimed at improving the capabilities of each athlete to obtain good results (Fernández, et al., 2009; Baiget, E., 2010; Suárez, D., 2015).

At the academic level, the aim is to acquire new knowledge through practice, and thus grow, as a future professional in Sports Sciences who stands out for carrying out an adequate process, during the weeks that the intervention will be made to the athletes, and likewise, contribute for the benefit of them and the institution in which, the <Practice 1> will be carried out.

This research project will be applied in order to optimize the performance of the athletes of the tennis federation of the San Jacinto campus, the improvement of physical capacities is sought, through already planned sessions, which seek the necessary adaptations to achieve excellent results, and the headquarters has the necessary means to

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carry out the research process with some technological tools, which can be of great help in monitoring athletes.

MATERIALS AND METHODS

Aerobic endurance: It can be defined as the ability to physically and psychologically resist a load for a long period of time, until a decrease in performance appears due to fatigue. Or as the ability to recover as soon as possible, after physical or mental effort (Zintl, 1991).

The resistance allows you to perform low or moderate intensity work and of long duration (from 2 minutes to several hours) without reducing efficiency. It is the ability to prolong a moderate-intensity effort. Due to this quality, the player increases the duration of his work and his cadence without oxygen debt, and his recovery is facilitated.

The biggest problem that the physical trainer has when planning endurance work is the lack of knowledge of the duration of the matches, because they are not finished until one wins, and can last from a minimum of approximately 30 minutes to almost 5 hours (Vila, 1999; United States Tennis Association (USTA), 2000; Le Deuff, 2003). Therefore, it is not the same to do so for the first case as for the second, because both the physical and psychological demands are different. The answer to this is to be prepared for the last case.

Reaction speed: It is defined as reaction time to the time coming from a stimulus (visual awareness of the opponent's hits/balls) until the force is produced (Vickers, J., 2007).

For more than 100 years, accepted figures for simple reaction times for college-aged individuals have been around 190 milliseconds (0.19 seconds) for light stimuli and around 160 milliseconds (0.16 seconds) for sound stimuli. However, the fastest athletes in the world consistently have reaction times of less than 0.15 seconds.

In identical events, women have been shown to have longer reaction times than men. However, reaction time is not well related to sprints, which last more than a few seconds, but it is very well related to distances, because they are usually seen in the game of tennis (Mero, A., and Komi, P., 1990).

Therefore, training an athlete to improve reaction time should be a component of training tennis movements: 1.- Lateral technique, 2.- Strength and 3.- Power. In many training exercises, a visual stimulus should be used to help develop visual reaction time. An auditory stimulus (whistling, voice and clapping) is less specific to tennis than visual

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stimulus. The benefit of progress from having no stimulus, to a single visual stimulus to multiple visual stimuli, will help develop the athlete's ability to react.

Improving the athletes' choice reaction time can help tennis athletes in their reactions on the court and it would be advisable to add it as a training stimulus during off-court training. A study that analyzes the average reaction times (from the throwing of the ball from a machine to the initial movement of the racket), in volleys of players specialized in tennis obtained 0.226 seconds for the forehand and 0.205 for the backhand (Chow, J., Carlton, L., Chae, W., Shim, J., Lim, Y., and Kuenster, A., 1999). It is important to teach movement technique before entering more challenging environments including visual stimuli.

"Physical preparation is the part of training, which seeks to put the athlete in the best possible state of shape, optimizing their natural aptitudes and developing their physical qualities to the maximum, through systematic, gradual and progressive exercises, which enable the adaptation of the body for the specific and technical training of each sport, and thus, to obtain optimal sports performance" (Markov, 1991).

Another concept, which can be established is physical preparation: "As far as physical preparation is concerned, we must point out that most of the tests that are carried out are tabulated with an exclusively tennis population, which allows us to define more accurately the true conditions of future players, in addition to being able to focus later with greater suitability on the training sessions" (Florido, E., 1996).

Most authors characterize field tennis as: an individual sport, with open skills, because the ball and the player move, which requires constant coordination and spatial-temporal adjustment of the athlete and body control in terms of displacements, one's own body and objects. In addition, they recognize its acyclic character, whose technique is mainly given by the development of basic, special and specific strokes. "There is agreement that being a game of opposition, or confrontation with another, makes it predominantly tactical, given the following aspects: 1.- Style of play and 2.- Phases of: defense, dominance, direction, attack and definition" (Tessie, J. (1971).

RESULTS AND DISCUSSION

A study with young athletes of a high level, which applied a combined speed and agility training program. The training program lasted six weeks and was adjusted to his coach's schedule. The players were in the pre-season period and were doing 2-3 sessions

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a week. Under such conditions, the study's hypothesis was that the combination of the two training programs would produce improvements in speed and agility performance in tennis players. The results did not report significant differences in any of the tests performed, but remarkable effect sizes were found (moderate to high in speed, agility and jumping), which could be mainly due to the small sample size (Fernández, J., 2015).

Two modalities of intervention based on reaction speed were identified: 1.- The first consists of the speed that an individual has when faced with a stimulus, which can be: visual, auditory or by physical contact, the programs carried out with methods of repetition, varied method and sensory method are highlighted.

Stolen (2005) stated that: "Cardiac output limits VO2 Max in well-trained individuals. So, to improve it, given the impossibility of overcoming the MHR, it is possible to do so, by improving the maximum stroke volume. Interval training performed at an exercise intensity corresponding to 90-95% of MHR for 3-8 minutes, with an active recovery of 2-3 minutes at 70% of MHR, is tremendously effective in improving stroke volume, hence VO2 Max.

METHODOLOGY

APPROACH

This study is of a quantitative approach, because it is based on collecting data information, to later be analyzed and reach conclusions about the reality itself, the club will be made aware of the report by the coach about, yes, the players improved in individual training, in order to determine in the future: What is the best method to optimize performance? (Hernández, R., & Mendoza, C., 2008).

DESIGN

The design of this study of <Practice 1> is cross-sectional, because its purpose is to determine, yes, there is a change between the variables evaluated at the beginning of this research (Hernández, et al., 1997).

That is, to determine if there are changes in the physical capacities of aerobic endurance and reaction speed of the athletes in the future competitions in which they participate at the venue: <San Jacinto>.

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RESEARCH SCOPE

The scope of this practice project is explanatory, because, within the bibliographic review carried out in the different databases, by means of the search equations made up of the keywords, at the international level (31) functional articles were found, which contribute to the project, unlike, at the local level, no regional and national correlation was found with the project (Hernández, R., et al., 1997).

TRAINING SESSIONS

Training sessions were developed with the progressive application of loads and intensities. This in order to improve the performance of each trained child, all this with a view to the competitions in which the club participates.

In order to have a session with a goal on a day-to-day basis, the tennis federation of the San Jacinto campus, gave the guidelines of the physical preparation that will guarantee to be able to follow the planning of the coaches.

MES	MARZO					ABRIL				MAYO			
DIAS	2	9	16	23	30	6	13	20	27	4	11	18	25
No. de Semanas	1	2	3	4	5	6	7	8	9	10	11	12	13
	PRE- COMPETENCIA	COMPETENCIA FESTIVAL DROGUERIA ALEMANA	ESPECIFICA – PRE- COMPETENCIA	COMPETENCIA (G-4) BOGOTA	GENERAL	ESPECIFICA – PRE- COMPETENCIA	COMPETENCIA G-4 / BOGOTA	COMPETENCIA G-4 / CUNDINAMARCA	GENERAL-ESPECIFICA	COMPETENCIA FESTIVAL SAN JACINTO	COMPETENCIA G-4 / CUNDINAMARCA	- GENERAL	GENERAL
Control medico													
Test Físico													
Test Táctico													
Test psicológico													

The calendar shows not only the weeks, but also each of the competitions in which athletes aged 8-10 will participate.

Taking this into account, the coaches also had very well elaborated and structured the objectives of each of the weeks.

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PLAN SEMANAL DE ENTRENAMIENTO FISICO TENIENDO EN CUENTA LA ETAPA.					
ETAPA	DIA DE LA SEMANA				
	LUNES	MARTES	MIERCOLES	JUEVES	VIERNES
E. GENERAL	Trabajo de resistencia a partir de circuitos coordinativos	Fuerza a partir de ejercicios funcionales.	Resistencia aeróbica a partir de sumatoria e tiempo.	Fuerza explosiva y estabilización de core.	Trabajo de integración con énfasis en resistencia.
E. ESPECIFICA	Coordinación teniendo en cuenta un objetivo específico (ritmo, reacción, orientación...)	Velocidad específica a partir de desplazamientos propios del tenis.	Resistencia a partir de ejercicios intervalicos de alto impacto.	Balance y equilibrio con trabajos dinámicos y unipodales, estabilización y fortalecimiento del core.	Trabajo de integración y lúdica con énfasis en velocidad y agilidad.
E. PRECOMPRETITIVA	Trabajo de coordinación específica, con el objeto móvil, (la pelota).	Desarrollo de la fuerza con movimientos propios del tenis, estabilización del core.	Resistencia a partir de ejercicios de desplazamiento específicos del tenis (tiempo, ejecución y distancia).	Desarrollo de rutinas de vuelta a la calma propias para la competencia, priorizando en métodos de estiramiento.	Trabajo de integración con énfasis en patrones básicos de movimiento.
E. COMPETITIVA	Desarrollo técnico implementando, desplazamientos, posturas y golpes de tenis.	Resistencia a partir de ejercicios de desplazamiento específicos del tenis (tiempo, ejecución y distancia).	Desarrollo de rutina de calentamiento y estiramiento dinámico específico para competencia.	Desarrollo de la reacción y orientación a partir de las características del tenis.	Trabajo de integración con énfasis en la agilidad, trabajo en equipo y estrategia.
E. RECUPERACIÓN	Trabajo de coordinación por medio de una actividad lúdica.	Trabajos de fuerza a partir de ejercicios funcionales y lúdicos.	Resistencia aeróbica con trabajo de intensidad moderada.	Trabajos de velocidad con énfasis en la competencia	Trabajo lúdico a partir de deportes complementarios, estiramiento vuelta a calma.

REFLECTION QUESTIONS

1. What lessons did the preparation of the diagnosis give you?

- Through the process of preparing the diagnosis, it is possible to evidence the methodology that can be implemented at the San Jacinto headquarters in the category of 8-10 years old, it allowed to evaluate the aspects of the place, what implements it had, the space to carry out the practice, the safety measures they have so that the children feel safe.
- In accordance with the above, the strengths and successes of the San Jacinto headquarters tennis federation were identified, with respect to the sports training process and with the purpose of contributing to its long-term sports life and, not only sought, sports performance.
- At the same time, a structured planning of the sessions was developed, so that they would be integrated with the objectives that the teachers want regarding physical preparation.

2. What learning did the applicability of the pedagogical intervention proposals represent for you?

- The application of several pedagogical strategies in the course of the internships at the San Jacinto headquarters helped to understand which pedagogical and didactic strategies contributed the most, so that they could be used with the

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children, and raised the level of motivation of the children, so that they attended, understood and appropriated more and better the forms of exercise and the technical forms. raising the levels of learning in this sport. Also, it should be added that these methods of pedagogy were sometimes practiced at the individual level, because the children were different from each other.

3. ***What were your most significant learnings obtained from the completion of <Practice 1>?, Mention and support the three most significant learnings, obtained as a result of <Practice 1>?***

- First of all, it was learning to socialize with this type of population, because it is not very simple, as many think, there were days when they had no motivation to do the exercises, but, even so, they practiced them, but, when they arrived very restless, they talked too much, and they did not pay attention, in an adequate and pertinent way, but a pedagogical process was carried out. so that they could even do the exercises with additional verbal interaction.
- The second learning was the sport, this sport with the time I had been in the place facilitated the adaptation process, so that likewise, certain modalities and strokes could be known, as well as the understanding, about what were the most important abilities in this sport.
- The third learning of this <Practice 1> was to carry out entertaining sessions for the children, it was about maintaining dynamics with a wide variety of forms played, forms of exercise and technical forms, and the lantern, each one was asked what they thought, yes, very strong or very soft, so they found a balance so that they, they felt that they had learned and that their abilities improved. But, without tiring the children before their training session.

CONCLUSIONS

- The development of the program to improve physical capacities, reaction speed and aerobic endurance in the 8-10 year old category of the San Jacinto Headquarters Tennis Federation, was a quite enriching pedagogical process for training as a future professional in the field of sports sciences.

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- All the knowledge that has been acquired in the area of sports training and together with the other sciences during the academic process, came to be reflected in the project, facilitating the execution in the planning.
- The responsibility of planning and executing the session in each class is of utmost importance, to safeguard the physical integrity of the children when doing the activity.

CONTRIBUTIONS

- The time that the intervention lasted with the children of the 8-10 years old category, it was evidenced that, due to the perseverance of the children, there was an improvement in their sports performance, this made the sessions that were planned through the knowledge of the training area.
- A significant gain was obtained in the physical capacities of the children who participated in the intervention for the project, implementing a good pedagogical process, so that the children felt motivated to carry out each class session.
- Good teamwork was done with the children's coaches, which allows everyone to have a good experience and obtain knowledge that could contribute to the process of future athletes.

RECOMMENDATIONS

- It is important that all those involved in the sports training of children in the 8-10 years old category are informed of the training program that will be applied to the athletes.
- Take all corrections from experienced coaches in a positive way, to build a good relationship, and to be able to learn, even more, in order to apply it in a future career.
- To leave a good image as interns and representatives of the university, because this allows them to leave the doors open for future colleagues who will work in research projects with similar characteristics.

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