

Motor training program with rackets to develop an ambidextrous laterality in upper extremities that improves sports skills in children 9 to 12 years old, Chignahuapan, Puebla**Programa de entrenamiento motriz con raquetas para desarrollar una lateralidad ambidiestra en extremidades superiores que mejore las habilidades deportivas en niños 9 a 12 años de edad, Chignahuapan, Puebla**

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Abstract

Ambidextrous laterality is defined as the possibility of performing actions with both parts of the body, either left or right, so in this research the objective was to develop ambidextrous laterality in upper limbs through a motor training program with the help of rackets, to improve sports skills. Quasi-experimental, longitudinal and active observation type. The sample was randomly selected with 32 participants, 16 females (50%) and 16 males (50%) from 9 to 12 years old with an average age of 10-11 years, belonging to the community of Llano Verde, Chignahuapan, Puebla. The participants were evaluated using the Harris test and the Sports Fundamentals rubric at the beginning, intermediate and end of the motor training program that consisted of 27 sessions. The results showed an advance of 100% in at least one sports technical foundation in each of the participants. In conclusion, the results obtained show that ambidextrous laterality can be developed through a motor training program and repetitions, highlighting a greater possibility of movements, abilities and motor skills that is reflected in sports success.

Resumen

La lateralidad ambidiestra se define como la posibilidad de realizar acciones con ambas partes del cuerpo ya sea izquierda o derecha, por lo que en esta investigación el objetivo fue desarrollar una lateralidad ambidiestra en extremidades superiores mediante un programa de entrenamiento motriz con ayuda de raquetas, para mejorar las habilidades deportivas. De tipo cuasi-experimental, longitudinal y de observación activa. La muestra fue de selección aleatoria con 32 participantes, 16 féminas (50%) y 16 varones (50%) de 9 a 12 años con edad promedio de 10.11 años, pertenecientes a la comunidad de Llano verde, Chignahuapan, Puebla. Los participantes se evaluaron mediante el test de Harris y la rúbrica de Fundamentos Deportivos al inicio, intermedio y final del programa de entrenamiento motriz que constó de 27 sesiones. Los resultados mostraron un avance del 100% en al menos un fundamento técnico deportivo en cada uno de los participantes. En conclusión, los resultados obtenidos demuestran que la lateralidad ambidiestra puede ser desarrollada mediante un programa de entrenamiento motriz y repeticiones, resaltando en una mayor posibilidad de movimientos, habilidades y destrezas motrices que se refleja en el éxito deportivo.

Ambidextrous laterality, Training**Lateralidad ambidiestra, Entrenamiento**

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Introduction

Although human beings have anatomically equal parts (in symmetry), they mostly use one side with respect to the other to perform actions or movements in their daily life, whether it is combing their hair, personal hygiene or writing. Within the sports environment, these preferences are found when throwing and receiving a ball, kicking a ball, adopting a lateral position either left or right and when handling sports equipment such as racquet sports, to mention a few actions within the sport, the knowledge of this laterality allows an understanding of their technique and the development of a personalized training¹.

Laterality and according to the dominance or preference of one side of the body over the other (in symmetry) there are different types to mention three specific ones:

1. The right side of the body is used as a preference.
2. Left-handed. The left side of the body is used as preference.
3. Ambidextrous.

Use of both parts of the body with the same efficiency. False left-handedness: Product of a temporary impediment, where the causes are reasons outside the individual. False right-handedness: It occurs mainly in people who, being left-handed, were forced to use their right hand in a preferential way.

Ambidextrous laterality is defined as the possibility of performing actions with both parts of the body, either left or right, as mentioned by Quintana². Giving great importance to the relationship between laterality and sport, being embodied at all times, from the choice of a player to kick a ball, the pitcher to perform a certain shot, the boxer for the placement of his defense and blows, in martial arts studies are found in Judokas who claim that the laterality of the upper and lower extremities shows a significant correlation with the choice of the dominant directions of attack in combat³, being called podal laterality, ocular, auditory, even shoulder or hip.

The human being by nature tends to explore and feel attraction for activities where he can observe, listen or manipulate, for this reason, the rackets are a means of learning, have an added value and are of utmost importance for the teaching or practice of sports fundamentals of other sports, not only those involving the use of the same rackets. The age of the participants, being school age, is of great support for the implementation of the program as a method of training their motor development and the acquisition of new motor skills, the sports activity becomes the best complement to develop and improve their technical skills, on and off the playing field⁴.

Quintana establishes the selection of sports talent from a young age, focused on ambidextrous laterality in baseball batters, since laterality in the selection of ambidextrous batters is of great importance in physiological and psychological conditions on both sides of home plate, which affects bilateral work, since the use of ambidextrous laterality is reflected in an optimal and effective sports performance², For this reason, it is hypothesized that motor training with rackets in children can develop ambidextrous laterality in the upper extremities, improving their sporting skills. And in turn the main objective of demonstrating the benefits of the motor training program with rackets to develop ambidextrous laterality in upper extremities to improve sports skills in children 9 to 12 years old from the community of Llano Verde in the municipality of Chignahuapan, Puebla.

A recent study by the Ruhr University of Bochum, Germany, from which the article Ontogenesis of lateralization by Ocklenburg⁵ is derived, establishes the true reason why human beings are inclined at birth to be left-handed or right-handed. In addition, German researchers are studying that the preference for the right or left hand depends on environmental factors produced during pregnancy.

This article consists of a section called description of the method, where the procedure throughout the research is explained, as well as the measurement instruments and collection formats, which are used to demonstrate the results obtained in graphs, and a section of conclusions as well as some suggestions for future researchers interested in the subject.

Description of the Method

This is a longitudinal, quasi-experimental, active observation research. The universe consisted of 32 individuals from the community of Llano Verde, municipality of Chignahuapan, Puebla, who formed the sample, which was randomly selected, with 16 female (50%) and 16 male (50%) participants, between 9 and 12 years of age, with an average of 10.11 years old.

Variables and measurement instruments

The independent variable was the training program, through the execution of physical exercises with the intention of ensuring a satisfactory participation or effective objective, as mentioned by Issurin⁶.

The dependent variables are: Ambidextrous laterality, whose cases is where there is no defined preference and both parts of the body are used equally, these can get to dominate both profiles and develop activities of all sports fundamentals⁷, the evaluation is performed by means of the Harris Test instrument that establishes 10 points to determine the laterality of the hand (Throwing a ball, sharpening a pencil, driving a nail, among others⁸). Sporting ability is based on the relationships that the player establishes with the elements of the environment and the instruments used to relate not only being physical and sporting, but also mental, resulting in an adequate level as an athlete⁹, so that, in this research, the measurement was through the sporting ability rubric, in which the fundamentals of the following sports are contemplated:

- a) Basketball (bouncing, dribbling, passing and shooting¹⁰) by means of the following activities: 1. Bounce the ball for a distance of 20 meters in a straight line. 3. 3.- Bounce the ball for 20 meters dodging obstacles on the floor. 4.- Free throw shot. 5.- Pass in static place. 6.- Pass in motion.
- b) Tennis (drive stroke, volley stroke, lob stroke and racquet grip, Sanchez¹¹) with the activities of: 1.- Hit the ball in drive. 2. 2.- Hit the ball in volley. 3.- Hit the ball in lob. 4.- Performs a racquet grip.

- c) Baseball (pitching, De la Fuente¹²) the activities performed were: 1. 2.- Performs throw-pitch to target. 3.- Performs static pitching. 4.- Performs shooting on the move.

This rubric establishes a measurement range from 1 to 4 (1.- Without mastery of the sport fundamentals or materials. 2. 2.- Performs the sport foundation, but does not control the materials. 3.- Performs the sport foundation and controls the materials in its majority. 4.- Dominion and control of the sport foundation and the materials).

Procedures

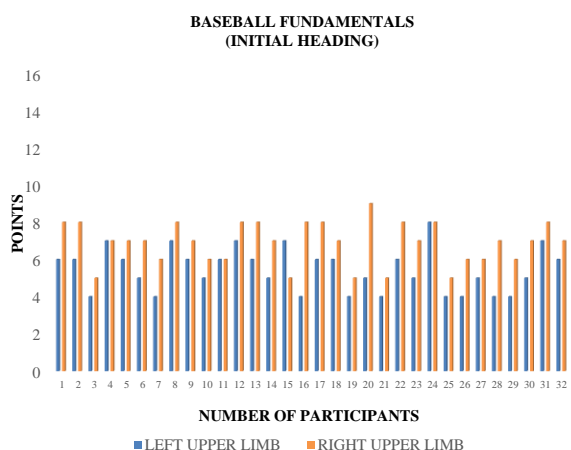
Parents or guardians were asked to sign an informed consent form, accepting the participation of their children, and then the explanation of the motor training program and its application. The program consisted of 27 sessions, three sessions per week, for three months, each session with a set objective as well as the activities planned and carried out based on the movements based on basketball, tennis and baseball training, sports that use the upper extremities frequently.

Results

With the data obtained in the initial, average and final evaluations of the Harris test and the rubric of sports fundamentals of basketball, baseball and tennis we can prove the benefits of the racquet motor training program of the 32 participants in the development of ambidextrous laterality and sports ability. The results of an initial evaluation according to the fundamentals of basketball, showed an almost null use of the less dominant hand of 46% of the participants (the score that can be obtained by being 6 activities, is minimum 6 maximum 24). In the final measurement of the basketball fundamentals, an increase of 100% was achieved in all 32 participants in at least one of the fundamentals (either bouncing, dribbling, passing or shooting). Two participants (6%) had total mastery in all the established activities.

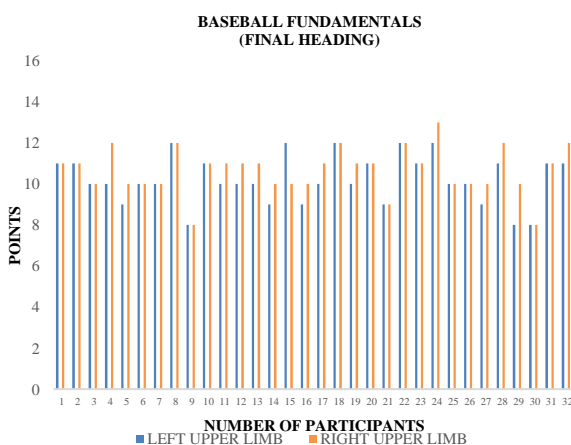
In tennis, being a sport with a higher degree of complexity than the previous ones due to the use of a sport material (racquet), at the beginning it is observed that 37.5% of the participants lack any fundamentals, in the result of the training program, an advance of 89% is observed regarding the basic grip of the racquet and 51% according to the different strokes, (for verification of results, the initial and final data of the baseball rubric and the Harris test are plotted).

Regarding baseball, the following graph 1 shows the reception (fielding) and throwing (pitching), the two sports fundamentals evaluated. A measurement of 31% of the participants lacks one of the fundamentals (4 activities, minimum score 4, maximum 16).



Graphic 1 Initial baseball evaluation
Source: Baseball Sport Fundamentals

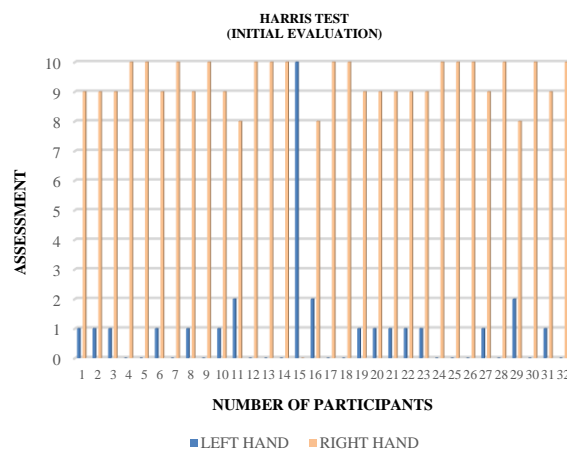
In the final result of baseball practice, with both laterals, 100% progress was obtained with respect to their initial evaluation in at least one sports fundamentals. Twenty-one percent of the participants achieved full mastery with one hand.



Graphic 2 Final evaluation
Source: Baseball Sport Fundamentals

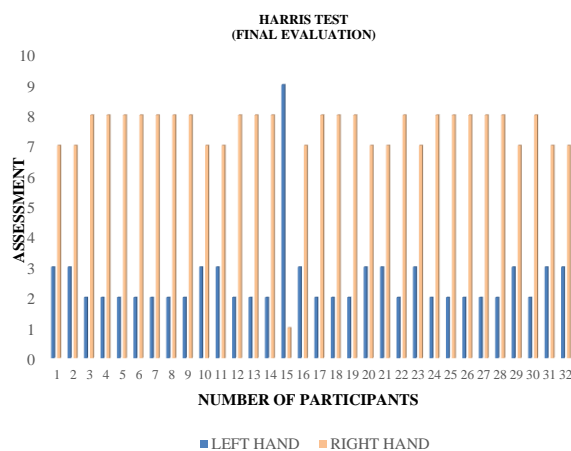
As mentioned, the evaluation of laterality was through the application of the Harris test, the results are as follows:

In the initial evaluation (Graphic 3), 50% of the participants use one hand for the performance of the 10 daily actions, 40% occupy in one action the less dominant hand and 10% in two actions.



Graphic 3 Initial evaluation
Source: Harris test

The final evaluation shows that 3% use the less dominant hand in 1 of the 10 activities of the Harris test, 62% manipulate two activities and 35% 3 actions with the less dominant hand.



Graphic 4 Final evaluation
Source: Harris test

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Discussion

The results obtained denote a greater use of the less dominant extremity, 100% of the participants achieved an advance in the use of the less used hand of 50% of the fundamentals of each sport, being the baseball activities in which the greatest advance and effectiveness was achieved, derived from the results, for right-handed individuals, the left hand is less skillful than the right, this occurs because the left hand remains inactive. The opinion of Polo et al¹³ is important, in which he specifies working on developing the body segments and motor perceptual resources on the non-preferential side of the athlete, in order to improve the functional laterality of the dominant side and seek a homogeneous bilateral development. In the same sense, Quintana² mentions the use of different laterality tests in the sports field, as well as the planning, training and decision-making processes in competitions.

Conclusions

The motor training with racquet in both laterals improves the sport, techniques and body movements that allow having an advantage in motor skills and competition. A training with weight in the less dominant extremities is suggested, since in the great majority of the cases there is not the capacity of strength, coordination and power to carry out the movements.

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