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Original article

Special exercises to improve flexibility in female artistic gymnastics athletes

Ejercicios especiales para mejorar la flexibilidad en las atletas de gimnasia artística femenina

Exercícios especiais para melhorar a flexibilidade nas atletas de ginástica artística feminina

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ABSTRACT

This study begins when detecting that, in the flexibility physical tests, the artistic gymnastics athletes of the 6-8 years old category of the municipality of Pinar del Río present difficulties that bring with them little amplitude, harmony and aesthetics in the technical elements that they perform. Among the tests performed in the pioneer championship, one of them is to measure the level of flexibility, since it is a key element in the learning of techniques, which enables the joints to perform a maximum range and adopt different positions. Given this situation, it was proposed as an objective in this research to elaborate special exercises for the improvement of flexibility in athletes of the 6-8 years old category. For this purpose, theoretical methods such as analysis-synthesis, induction-deduction and empirical were used, specifically the review of documents, observation and measurement, which facilitated the research process. This study was conducted with the four coaches of the female artistic gymnastics specialty and the 4 athletes of the 6-8 years old category. The special exercises include aspects necessary for the athletes to be able to execute the tests without difficulties, that is, with a previous mastery and to obtain better results. This work offers the trainers special exercises that allow them to improve the flexibility training process, specifically in the ages covered by the research.

Keywords: Flexibility; Special exercises; Aartistic gymnastics.

RESUMEN

Este estudio se inicia al detectar que, en las pruebas físicas de flexibilidad, las atletas de gimnasia artística de la categoría 6-8 años del municipio Pinar del Río presentan dificultades que traen consigo poca amplitud, armonía y estética en los elementos técnicos que estas realizan. Dentro de las pruebas que se realizan en el campeonato pioneril, una de ellas es para medir el nivel de flexibilidad, ya que constituye una pieza clave en el aprendizaje de las técnicas, lo que posibilita que las articulaciones puedan ejecutar un máximo recorrido y adoptar disímiles posiciones. Dada esta situación expresada, se propuso como objetivo en esta investigación elaborar ejercicios especiales para el mejoramiento de la flexibilidad en las atletas de la categoría 6-8 años. Para ello, se utilizaron métodos teóricos como el análisis-síntesis, inducción-deducción y como métodos empíricos, específicamente la revisión de documentos, la observación y la medición, los cuales facilitaron el proceso de investigación. Este estudio fue realizado con las cuatro entrenadoras de la especialidad de gimnasia artística femenina y las cuatro atletas de la categoría 6-8 años. Los ejercicios especiales incluyen aspectos necesarios para que las atletas puedan ejecutar las pruebas sin dificultades, o sea, con un dominio previo y que obtengan mejores resultados. Este trabajo ofrece a las entrenadoras ejercicios especiales que les permiten mejorar el proceso de entrenamiento de la flexibilidad, concretamente en las edades motivo de la investigación.

Palabras clave: Flexibilidad; Ejercicios especiales; Gimnasia artística.

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RESUMO

Esta pesquisa foi iniciada quando se descobriu que, nos testes físicos de flexibilidade, os atletas de ginástica artística da categoria de 6-8 anos no município de Pinar del Río, apresentavam deficiências que resultaram em pouca amplitude, harmonia e estética nos elementos técnicos que executavam. Entre os testes realizados nos Campeonatos Pioneiros, um deles é medir o nível de flexibilidade, pois ele constitui um elemento chave no aprendizado das técnicas, o que permite que as articulações efetuem uma gama máxima de movimentos e adotem diferentes posições. Dada esta situação, o objetivo desta pesquisa foi redigir exercícios especiais para a melhoria da flexibilidade em atletas da categoria de 6-8 anos de idade. Foram utilizados métodos teóricos como análise-síntese, indução-dedução e métodos empíricos, especificamente revisão, observação e medição de documentos, o que facilitaram o processo de pesquisa. Este estudo foi realizado com os quatro técnicos da especialidade de ginástica artística e os quatro atletas da categoria de 6 a 8 anos de idade. Os exercícios especiais incluem todos os aspectos necessários para que os atletas possam realizar os testes sem dificuldades, ou seja, com um controle prévio e para obter melhores resultados. Este trabalho oferece aos treinadores exercícios especiais que permitem melhorar o processo de treinamento de flexibilidade, especificamente nas faixas etárias que são objeto da pesquisa.

Palavras-chave: Flexibilidade; Exercícios especiais; Ginástica artística.

INTRODUCTION

Sports training theorists and the most prominent coaches agree that physical preparation is the basis of technical preparation in all sports, even more so in the case of artistic gymnastics, which is a sport with eminently technical characteristics. Artistic gymnastics is a competitive art sport, which requires great cleanliness and fluidity in the execution of its movements. Its practice requires a high level of physical preparation for the achievement of difficult technical elements that are executed in the different apparatuses.

This is a sport of great social importance. Its systematic practice helps to improve man's motor skills. It prepares him for life, creating habits, skills, educating volitional, moral and aesthetic qualities. It contributes to the strengthening of health, educates and harmoniously develops the forms and functions of the organism. It can be practiced by both sexes. Whoever practices it achieves a high coordination of all the functions of the organism.

In Cuba, the beginning of its systematic practice is conceived as of 6 years of age, with the objective of preparing athletes to perform physical preparation exercises that develop speed, agility, orientation in space, quick strength and flexibility. In addition, to be able to master the basic elements contained in the program for these ages.

In the formation of the gymnast, the initial preparation stage is very important. The achievement of elements, combinations and selections depend, to a large extent, on the preparation of strength, endurance, speed, flexibility and coordination. Echezarreta *et al.,* (2017) refer that at early ages, high sports results must be achieved, which is why they must have a marked accent, aimed at creating the physical bases of the muscle groups that interact the most in the achievement of technical elements, the latter based on the basic structured groups of this sport. It is well known that the morphological characteristics of girls who practice artistic gymnastics are important. Height, weight,

length of limbs, trunk, legs and arms ratio and joint mobility can be influential factors in the development of a gymnast; but psychological disposition factors and genetic inheritance factors, favorable to her physical development, are also aspects to be evaluated.

Sports preparation in gymnastics (artistic and rhythmic), as in the rest of high performance sports, such as early specialization sports, coordination and competitive art, presupposes an orientation towards the achievement of high sports results and the struggle for their improvement (Ameller and Ilisástigui, 2009). When this orientation is achieved, it is that the raising of the level of each of the components of gymnastic preparation from the very beginning of sporting life is fulfilled.

The practice of gymnastics develops strength, speed, endurance, flexibility, educates values, creates behavioral habits and contributes to the strengthening of health. Guardo (1998) refers that its objective is to extend the years of existence because it is necessary to keep in mind an adequate quality, together with the harmonious development of the functions of the human body, since, in the end, it is necessary to prepare man for life. It is therefore necessary to observe the preparation with an integral view of the physical capacities, which as a whole guarantee success in competitive performance.

Among the basic components of the preparation, the development of strength, endurance, speed, flexibility and coordination play a decisive role in the assimilation of the technique, which facilitates the assimilation of the motor gesture in terms of movement direction, effort intensity and amplitude.

Although there are not many texts on this sport, the bibliographic reserve allowed to know what authors say about physical preparation.

In Young Gymnast, Shlemin (1968) refers:

> "young gymnasts can achieve sporting mastery on the basis of a multilateral physical, special-motor and technical preparation, carried out at all stages of education".

This author refers to the importance of having a progressive development of the special and functional physical abilities and capacities of young people, so that the highest level of their achievements falls at the age of maturity and allows young people to reach a high degree of development of motor functions and master with perfection the technique of high mastery in the execution of the different exercises and to be able to control their psychic activity.

Physical preparation in artistic gymnastics is governed as one of the most important directions in athletic preparation from the ages of initiation to the most experienced. For many coaches, it constitutes the seventh event that never ceases to be trained (Ukran, 1980). It is one of the conditions of success in the learning of gymnastic exercises, it raises the work capacity and reduces the learning times of technical preparation; to this, Granda (as cited in Ukran, 1980) refers when assuring that it is unlikely or almost impossible to achieve a high technical preparation in the absence of a physical preparation that covers from the simplest exercises of coordination, flexibility and agility, to those that require large manifestations of rapid force and/or resistance to strength in all its magnitudes (Granda, 2016).

Physical preparation is a component of the sports training process, consisting of the development of the athlete's functional potential and physical qualities to the highest levels; all or some of them depending on the sport, the subject and its degree of training (Pochini, 2017). When in practice it is possible to achieve an adequate physical development in athletes, then high results will be achieved in the specialty they practice.

Young gymnasts can achieve sport mastery based on a multilateral, special, motor and technical physical preparation, carried out at all stages of teaching, based on scientific data on the possibilities of the child or youth gymnast's organism (Echezarreta, 2017). When in the training sessions the athletes achieve this preparation, it is said that the objectives proposed in the Integral Program for the Preparation of the Artistic Gymnastics Athlete (2017-2020) are met.

Artistic gymnastics coaches are in charge of maintaining and improving the different physical abilities in their athletes, in a correct way and with a proper postural attitude.

It is important to keep in mind that flexibility is a physical capacity that makes possible the amplitude of movements. Therefore, it symbolizes beauty, aesthetics and lucidity in the execution of technical elements. For this reason, the coach must know the physical potential of each athlete and have knowledge about the training of this ability.

Flexibility exercises simultaneously strengthen joints, ligaments and muscle fibers and increase the elasticity of muscles and their ability to stretch. This is a very effective means of preventing muscle trauma.

The individual is born with a certain flexibility that is gradually lost. For that reason, it must work systematically from the infantile age. It has been proven that between 13 and 14 years of age, the body begins to undergo morphological and physiological changes.

Physical activity and health without flexibility are difficult to perfect the technique and educate the expressiveness of movements. Santos, Arce, Lebre and Avila (2015) refer that the development of this physical quality leads to positive results in sports performance.

Flexibility is the key to learning the techniques and allows the joints to perform a maximum range of motion and to adopt different positions. Gia and Lenin (2016) describe that it is the main condition that is lost with the passing of time due to different factors, but that can be developed and taken advantage of at early ages between 6 and 11 years, where the infant's body is in full physiological and morphological development.

Flexibility is produced both by the action of endogenous agents, contraction of antagonist muscle groups, as well as exogenous agents concerning the own body weight, overload, inertia, other implements (Beltran, 2017). When there is a good level of flexibility, it is said that the athlete achieves the range of motion of all joints to execute, more effectively, the exercises in competition and muscular injuries are avoided.

Flexibility is defined as the capacity of the organism to manifest its joint mobility and muscular elasticity García and Batista (2018) state that,

> "The first depends on articular elements, understood as: articular cartilages, capsules, ligaments, menisci and synovial fluid to perform movements with a given amplitude, according to the demand of the same. It is manifested from the earliest

age; this means that its development should be considered from an early age, since it tends to disappear in the absence of activity, as ontogenesis progresses".

This capacity can be exercised by means of different techniques. López, Vernetta, Lizaur, Martínez and Ariza (2019) explain that it has been evidenced in several studies that the technique Proprioceptive Neuromuscular Facilitation (PNF) has multiple benefits because it allows to assimilate more quickly and successfully the technique of gymnastic exercises.

In the clinical sense, these authors underline the importance of achieving flexibility values that are compatible with the functionality of the daily use of the body segments. It is fundamental to reach a clearly accepted knowledge with the characteristics of the various structures that influence also, in a direct way, the processes of joint mobility work. Unlike the motor aptitudes of strength, speed and others for the athlete, flexibility does not refer to the motivating factors of the movements, but to the functional morphological properties of the locomotor apparatus.

Flexibility is the ability to be able to perform exercises with great amplitude. Escobar (2019) refers that the amplitude of movement depends, to a large extent, on the elasticity of the muscles and ligaments and the joint mobility of the joint involved in the body segment being moved. Jiménez (2019) states that this capacity allows improving sports performance directly and indirectly in many sports.

If each of these criteria is analyzed, a fundamental and common element is the idea that flexibility constitutes the possibility of performing joint movements with great amplitude by oneself or under the influence of external forces, without reaching the threshold of pain. It is a very effective means of preventing muscular trauma. In artistic gymnastics, it is essential for the gaining of flexibility to execute exercises where different techniques, static and dynamic exercises and neuro proprioceptive facilitation for all joints are used; in this way, exercises that seek the maximum extension of the movements until reaching their limit positions are put into practice, focusing on the mobilization of the joint, the elements that integrate it and the elongation of the muscles that affect it, the most current trends in the development of flexibility.

Bearing in mind the above, the authors of this research assume the definition of flexibility given by Ilisástigui (2012) as the capacity that gives man the possibility to perform movements of great amplitude in the joints.

The Comprehensive Program for the Preparation of the Artistic Gymnastics Athlete (2017-2020) proposes that during the first -34 years in this sport, the work of flexibility should be directed in a greater percentage to its general development.

The path of active and passive dynamic exercises -should also be used, in proportion favorable to the active ones. It is emphasized that the number of exercises should be gradually increased and that the method of repetitions is the most appropriate. Therefore, this quality should also influence sports performance.

The National Commission of Women's Artistic Gymnastics establishes in the *National Pioneer Competition Program (*2007-2008), in force for the 6-8 years old category, requirements for the evaluation of the body structure of technical skills and physical capacities; it alludes, among them, to flexibility, which is an important physical quality for gymnasts.

It is considered that this program lacks special exercises for flexibility work, making it difficult to improve the results in the tests established for this capacity.

Based on the above, it follows that the pioneer competence program is not fully functional for working with flexibility.

For the realization of this research, authorized sources on the subject were consulted, both nationally and internationally, in order to contribute to the systematization of the object of study. Some of these references have been taken into account for the analysis and comparison of the results shown in later sections. Among these referents are the following; (Agramonte, *et al.,* 2017; Burt, 2020; Toledo, 2020; Barry, 2021).

The objective of this study is to elaborate special exercises for the improvement of flexibility in athletes of the 6-8 years old category of artistic gymnastics in the municipality of Pinar del Río.

MATERIALS AND METHODS

In this research, the four artistic gymnastics female athletes of the 6-8 years old category of the municipality of Pinar del Río were considered as the population.

Theoretical methods such as the historical-logical were used for the determination and analysis of the background of the training process and, in particular, in flexibility.

The analysis-synthesis method was used to break down the training process to determine the essential aspects, types of flexibility and ways to exercise them.

From the work with the theoretical-methodological references on flexibility, it is gone from the general to the particular and vice versa. During the research, the induction-deduction method allowed to reach generalizations about the training process.

The systemic-structural approach was used as an orientation for the knowledge of the structure of the methods, approaches and trends used in the process of flexibility training and in the elaboration of the special exercises offered.

The empirical methods used were:

Documentary review: for the analysis of documents such as: the Comprehensive Artistic Gymnastics Athlete Preparation Program (2017-2020), the 2020 Pioneer Championship program, competition program (Pioneer National Championship), training units and other bibliographic sources that delve into flexibility and, in particular, for this sport.

Group interview with trainers: it was used to verify the level of updating of the trainers in the knowledge about the work of flexibility as a capacity, the importance of this for technical improvement and the development of other capacities.

Interview with key informants: this allowed the collection of information provided by retired specialists with more than 45 years of experience in this sport on special exercises that can be used to work on flexibility.

Observations were made in training sessions to know the exercises that were worked for the development of flexibility and competitions to see the execution of the gymnasts' tests.

Criteria of specialists: a group of professionals (with more than 15 years of experience) with knowledge of the subject under study was selected and they made a critical analysis of the special exercises proposal, giving their suggestions and recommendations for the final conformation of the proposal.

As a mathematical-statistical method, descriptive statistics was used with their respective percentage distributions and graphic representations, and descriptive statistics procedures were used to organize, present, summarize, analyze, interpret and present the information obtained from the application of the empirical methods through the analysis of mean frequency distribution and percentage and average calculation.

RESULTS

It was considered opportune to analyze the contents of the Integral Program for the Preparation of the Athlete, Pioneer Championship and Training Units in terms of flexibility exercises for the 6-8 years old category of artistic gymnastics.

The results obtained from the review of the Integral Program for the Preparation of the Athlete and the Pioneer Championship Program showed that they have several test to measure the physical capacity of flexibility in the initial selection. The contents of the test were analyzed with their respective evaluation scale, but, at the same time, they lack exercises that allow flexibility training. In the training units, some special exercises are included, although they are considered insufficient due to the relationship that should exist between these and the characteristics of the tests that are carried out in the pioneer championship. This limits that the execution of the technical elements can be with amplitude, harmony and aesthetics.

From all this analysis, it is inferred the need to develop special exercises to improve flexibility in athletes of the 6-8 years old artistic gymnastics category.

From the interview conducted with the coaches (two of them, representing 50 %), are intermediate technicians and two (50 %) are university graduates; one (25 %) has two years of experience in the sport of artistic gymnastics and the remaining three have three years of experience. 100 % of them search in digital media to be updated on the physical skills they teach to their athletes. However, this information is insufficient. They refer that there is no deepening in the subject related to physical capacities associated to special exercises in initial selection. They raise as a need, information regarding flexibility and its link with the characteristics of the tests carried out in the pioneer championship.

With the results obtained in the diagnosis of the current situation of the flexibility training process in artistic gymnastics, the need to elaborate special exercises for the improvement of flexibility in the athletes of the 6-8 years old category of artistic gymnastics in the municipality of Pinar del Río is determined.

An interview was applied to two key informants, artistic gymnastics coaches, with more than 43 years of experience and with excellent results at national level; they state that the results obtained in the province by athletes in the 6-8 years old category are low, which influences this:

- Material conditions
- The preparation of the trainers, since they impart the physical capacities due to the knowledge they have as athletes in this sport.
- They have no pedagogical training.
- In recent years, not enough special exercises have been used in correspondence with the flexibility tests established in the competition program.
- They propose special exercises that can be performed for the flexibility tests established in the Pioneer Competition Program.

Given the current situation regarding the object of study, the essential aspects to be taken into account for the development of the special exercises are determined. The proposed exercises have a rationale, general objective, methodological guidelines and special exercises for each of the flexibility tests.

Rationale**:** the special exercises favor the flexibility training process by showing the exercises, attending to three conditions: they are adapted, modified and new ones are incorporated for each of the tests established for flexibility, taking into account the characteristics of the artistic gymnastics athletes of the 6-8 years old category of the municipality of Pinar del Río.

In this proposal, one of the most important training principles for beginners in the sport is, without a doubt, repetition.

Objective**:** to improve the gymnasts' flexibility by means of special exercises according to the tests applied for the pioneer category.

In the competition program for the pioneer category (2019), five flexibility tests are established for these athletes: arch, front trunk flexion, shoulder dislocation, front, right and left *split* and right/left front and lateral leg hold. These tests evaluate the level of shoulder, back, trunk and leg flexibility of the gymnasts.

Special exercises for each of the flexibility tests

Arch

- From the front lying position, arms up, perform arching to touch an object hanging on a small fixed bar.
- From the lying position in front with a rubber band tied to the horse's support with harnesses and on the athlete's legs, perform back strength, looking for arching.
- From the arched lying position, arms back, legs are held and a seesaw is performed.

- From the arched lying position, arms back, hold the legs and maintain the position for 20 seconds.
- From the arched lying position with a rubber band on the legs, arms up, hold the ends of the rubber band and perform a seesaw.
- From lying arched, arms back and rope between hands, passed under feet. Perform see-saw.
- On a gymnastic bench, we rest our back transversely on it. With hands and feet resting on the mattress, perform arching.
- From a seated position with elbows resting on the floor, try to bring your feet close to your hands.
- From the kneeling position, arms up, perform arching, grabbing your feet with your hands and holding the position for 15 seconds. The elbows will be closed.
- Standing with arms up, with the back to the trellis, to lower hands down the rungs of the trellis to the ground.
- From the front lying position, with sand bags tied on the legs and small medicine balls in the hands. Perform see-saw
- From the arched position, with the back to the wall, stick the chest to the wall with arms and legs extended.
- From the arched position, try to touch an object located between the hands and feet.
- From the arched position, try to glue the ankles to the hands.
- From a standing position, make an arc and try to touch an object located between the hands and feet.
- Perform arc supporting the elbows, keeping the legs extended.

Front trunk flexion

- Standing with back on a step of the trellis, bring arms behind, holding a higher step with hands, force body forward, bending more and more (without bending your legs).
- Sitting facing each other with legs in a spreader, the rope taken between the two partners with arms in front, alternately perform trunk flexion to the front.
- In pairs, seated facing each other, with a rope held between the two partners with arms in front, alternately perform trunk flexion to the front.
- In pairs, sitting on your back, with a rope held between the two partners with arms behind the members of the pair, alternately trunk is bent in front of you.
- On a gymnastic bench from a standing position, perform a forward bend, lower the trunk and try to grasp the bottom.

- On a gymnastic bench, from a standing position, perform a front flexion down the trunk, try to touch with your hands a circle drawn on the mattress located in front of the bench.
- Standing with legs spread apart, with your back to the wall at a given distance, bend your trunk to touch with your hands a circle drawn on the lower part of the wall.
- On a beam, from the squat position, with grip below the beam, perform leg extension and drop back.

Shoulder dislocation

- Sitting with legs together and arms back, resting hands on the floor, walk with legs forward trying to dislocate.
- Sitting with legs together and arms back, resting hands on the gymnastic bench, walk with legs forward trying to dislocate.
- From the bow position, perform dislocate to the front, back, with arms extended.
- From a hanging position on a fixed bar, perform back and front flips.
- Standing, arms sideways and up holding the rope or baton. Perform shoulder dislocations. Keeping in mind the possibilities of the athletes. The distance between the shoulders can be decreased.
- In pairs, one gymnast sits with arms up, holding the rope or baton in the center, the other member of the pair, standing behind her back, will grab the rope or baton by the ends to perform the shoulder dislocation.
- Back with arms up, holding the rope, both athletes take an opposite step to the front, to the assault position alternately.
- Lying in front, arms back, holding the rope or baton in the center, the gymnast standing, next to her head, grasps the rope or baton by the ends to pull it upward. Do not separate the trunk from the floor.
- Lying in front with arms up, holding the rope or baton in the center, the gymnast will try to dislocate backwards. Do not separate the trunk from the floor.

Lateral (right/left) and forward (s plit*)* spreader

- Facing the trellis, grasping a rung of the trellis, raise the leg to its maximum extension by repeated thrusts.
- From a standing position, perform *Split* from a height of 5 centimeters between two mattresses and try to lower the pelvis as much as possible.
- From the standing position, perform *Split* between two wedges, each leg should be positioned on top of each wedge, look for maximum downward extension.
- From a standing position, perform *Split* between two low balance beams, each leg should be positioned on top of each beam, look for maximum downward amplitude.

- From a standing position, perform *Split* between two gymnastic benches, each leg should be positioned on top of each bench, looking for maximum amplitude.
- From the front lying position, bring the legs extended to the front (abdominal position), grasp the ends of a rubber band tied at the feet, and pull outward with both arms, looking for the spread leg position.
- From the front lying position, bring the legs extended to the front (abdominal position), in each of the legs tie a bag of sand. The gymnast will try to bring her legs into the sparranca position.
- From the standing position with the back leg bent and the front leg extended, perform leg extension to the knee support of the back leg and hands resting on the floor. Alternate with the other leg.
- From a standing position with the back leg bent and the front leg extended, extend the legs to the knee of the back leg and place the elbows on the floor.
- Alternate with the other leg.
- From a standing position, perform an assault with the back leg bent and resting on the ground, looking for maximum amplitude with one hand, grasping the back foot and the other placed on the knee.
- From the deep assault position rest elbows in front. Alternate with the other leg.

Leg maintenance (right/left) sideways and forward

- Standing in front of the trellis, place one leg extended on a step at hip height, perform semi-squats on the support leg, keeping the extension of the leg located on the trellis.
- Standing in front of the trellis, place one leg extended on a step at hip height, squat on the supporting leg, keeping the extension of the leg located on the trellis.
- Standing lateral to the trellis, raise the extended leg to the front and side with small overload.
- Standing sideways to the balance beam and holding the balance beam, the gymnast will have a small sandbag strapped to one leg. Perform overhead leg kicks to the front and above. Alternate with the other leg.
- Standing sideways to the balance beam and holding the balance beam with a small sandbag strapped to one leg. Perform overloaded leg balances to the front and above. Alternate with the other leg.
- Standing lateral to the balance beam and holding the balance beam with a small sandbag strapped to one leg. Perform overhead leg lift to the front and up, holding this position for seconds. Alternate with the other leg.
- From the front lying position, with a small sandbag strapped to one leg. Perform overhead leg kicks to the front and above. Alternate with the other leg.

- Standing facing the trellis, grasping a rung of the trellis at shoulder height with a small sandbag strapped to one leg. Perform overhead leg kicks to the side and up. Alternate with the other leg.
- Standing facing the trellis, grasping a rung of the trellis at shoulder height with a small sandbag strapped to one leg. Perform overhead leg raise to the side and up, holding this position for seconds. Alternate with the other leg.
- Standing, perform leg kicks up and to the side, trying to touch an object in suspension. Alternate with the other leg.
- From seated position with back against the wall, perform overhead leg grip, side arm in front of foot. Alternate with the other leg.

General methodological indications

- Alternate active and passive work with static and dynamic exercises.
- Maintenance times will fluctuate between 10 and 20 seconds.
- Exercise the proprioceptive neuromuscular facilitation (PNF) technique.
- A previous warm-up of all joints is required.
- It is convenient to observe the appearance of fatigue or pain in the execution of the exercise.
- The initial and main part of the training unit is worked on.
- The most commonly used method is repeated exercise.
- The dosage of the exercise depends on the type of flexibility and the form of exercise to be used.
- The breaks between the series of exercises are programmed with relaxation exercises. The series of exercises are performed in such a way that they reach several times the maximum limit of the amplitude of movement and lead gradually.
- In the succession of exercises, preference should be given to exercises for active flexibility and exercises for passive flexibility should be applied with the corresponding caution and the time to maintain the position should be the time stipulated for their work.
- Flexibility assessment should be carried out systematically.
- Gradually raise their demands on an individual basis.
- Perform their work bilaterally and in different directions.
- Start on the side of least flexibility for the athlete.
- Establish an adequate relationship between strength and flexibility work.
- Use breath control techniques to reach large amplitudes.

DISCUSSION

When analyzing the results of this research, a comparison was made with respect to the methodology used by different authors also focused on the establishment of flexibility exercises for gymnastics, but from different methods. In the case of González, *et al.,* (2017) exercises were performed from the relay position in sixth leg sideways to the bar, free arm next to the ear, the leg that is away from the bar is lifted to the front, at the same time a complete dorsal flexion is performed, achieving the greatest possible amplitude between the two legs, this movement is performed in two times, it is returned to the initial position and is executed lifting back the opposite leg to the one that returns, dorsal flexion of the trunk is performed trying to bring the thigh closer to the head, The complete exercise is performed in four movements. In the work of Montero *et al.,* (2019) a musical repertoire never worked before was used, focused on strong pulses or accents and rhythmic designs such as polyrhythms, expanding the music - movement relationship in general sense which awakens a motivation in gymnasts, causing an increase in the level of sensitivity, emotions and feelings of each of them, getting to establish a better direct communication with the music and the spectators.

In Seralegui, (2020) an evaluation of two flexibility training techniques, assisted passive method, was presented in Mar del Plata gymnasts, to determine which of the two has better results, both acute and chronic, and in Gálvez, (2021) matrices were instrumented that interrelated several variables that delimited in the future how to model a flexibility training in male artistic gymnastics. A questionnaire was also applied to 13 national and international specialists who fulfilled fundamental inclusion criteria. These have been the studies that have been taken as references for comparison due to their approximation to the object of study.

CONCLUSIONS

The theoretical and referential background studied on the process of flexibility training in artistic gymnastics allowed the elaboration of special exercises with their methodological indications to improve flexibility during training. The special exercises presented correspond to the physical level of the athletes who are the object of this study. They are easy to perform and are also elaborated according to the tests established by the National Technical Commission of Artistic Gymnastics to evaluate flexibility.

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