Procedure for teaching the Bullet Thrust technique in a wheelchair

Abstract

The most well-known and practiced adapted sport today, among others, is Athletics, however it is not dealt with in great depth, since there is hardly any literature with information that goes deeper into these issues, despite the fact that in the last ten years the research, especially in wheelchair racing. There is also no particular program for the preparation of wheelchair athletes, so coaches improvise their preparation, making adjustments to the comprehensive programs for the preparation of conventional athletes. The Impulsion of the Bullet in a wheelchair does not escape this reality, a discipline that does not have theoretical and methodological routes for its teaching, so this research had the objective of developing a procedure for teaching the technique of the Impulsion of the wheelchair. bullet in a wheelchair for athletes with disabilities. For this, methods of the theoretical level and the empirical level were used, such as: the survey, the interview, the criteria of users and group techniques, as well as the statistical methods and/or mathematical processing, and steps were determined to arrive at the proposal. As a result, a proposal considered by users as viable, useful, relevant, affordable and accessible to athletes was achieved.

Keywords: athlete, disability, bullet drive, procedure, teaching

Introduction

Adapted Sport is understood as physical-sports activity that is likely to accept modifications to enable the participation of people with physical, mental or sensory disabilities (Fernández and Espejo, 2020). The term most used today, people with disabilities, recognized by the United Nations Convention on the Rights of Persons with Disabilities, its transposition to the world of sport is as follows: disabled athlete, disabled swimmer, disabled athlete, disabled cyclist, or sport for people with disabilities. Athletics is understood as adapted to that set of physical sports activities and rules that include speed, jumps and throwing tests, susceptible to accept modifications to enable the participation of people with physical, mental or sensory disabilities. Among the benefits according to Fernández and Espejo (2020) are:

- ✓ Improve adaptation to effort.
- ✓ Strengthen the power of the undamaged muscle areas.
- ✓ Avoid joint or muscle retractions.
- ✓ Prevention of obesity.
- ✓ Slowing of degenerative diseases.
- ✓ Reduced bone mineral loss.
- ✓ Improve social relationships

Athletics has been on the program of the Paralympic Games since its inception. first edition, held in Rome in 1960. The competitions are aimed at athletes with all types of disabilities (physical, visual or cognitive), both in the male and female categories. The word paralympic is formed by the Greek preposition para and the word olympic. Therefore, Paralympic Games means 'parallel games to the Olympics' and illustrates how

the two movements go together (Paralympics. We have wings, 2021). In the 1988 Olympic Games in Seoul, the Paralympic athletes had their own residential area and used Olympic venues for the competition, specific wheelchairs were designed for Running, Rugby, Tennis and Basketball, this constituted an improvement for physical function, giving gave rise to more active individuals using stable, versatile, strong and lightweight wheelchairs. In addition to the efforts made in terms of care for people with disabilities, applied sciences are beginning to make their contributions to sports for the disabled, among which are Biomechanics, proof of this is the study of athletes who throw seated (Frossard, O 'Riordan and Goodman, 2012).

These works are joined by the efforts of human engineering laboratories dedicated to researching the design of adjustable throwing chairs or benches (Chung, Lin, Toro, Beyene, & García, 2010). However, there is a dearth of literature in the area of throwing chairs appropriate for performance sport with a view to wider use, such as major sporting events (Grindle, Deluigi, Laferrier, & Cooper, 2012). From this follows the care that must be taken when selecting exercises for teaching the Shot Throw, because according to Martínez (2019) the incipient studies related to sports activities adapted on the chair or bench, indicate a clear worsening in the conditions of healthy sports practice and a decrease in the improvement of sports practice. Regarding the classification for the Impulsion of the bullet in a wheelchair, the following classifications are of interest to this research due to the results that the province of Villa Clara has at a national and international level:

- ✓ F55. Has normal function of the arms and hands, as for the trunk, can extend the spine upwards and twist it, but there is no leg function. Tests: Throws, jumps and pentathlon.
- ✓ F56. Has normal arm and hand function, can extend trunk upwards, can twist and move back and forth when sitting, and has some leg function.
- ✓ F57.Meet the minimal eligible impairment criteria for lower extremity muscle strength impairment, lower extremity impairment, lower extremity passive range of motion deficit, or leg length difference, and are not comparable to profiles described above.

These classifications are also assumed, due to the fact that if the legs are properly fixed, the damage is less when training than the classifications with much more limitations (Reina, Vivaracho, García, & Roldan, 2021). In the case of a specific type of weight within the adapted shot put discipline (the ball, for example), the regulations of the Brazilian Athletics Confederation (CBAT, 2017) indicate that the objective of said throw is to place the ball as far as possible from a circle of 2.13 m in diameter and that has a 10 centimeter curved tip in the front area. The type of disability and the degree of involvement must also be taken into account, especially with regard to major disabilities, those that severely limit the person's independent life (Spanish Committee of Representatives of Persons with Disabilities (CERMI) (2018). It is important to highlight that the wheelchair is another of the technical elements that has evolved the most,

differentiating itself by its speciality, either for racing or launching, where fixed wheelchairs are used. However, the literature on the teaching of the Bullet Drive is scarce. In this regard, Cumellas (2010) proposes indications for the adapted shot put at school from the Physical Education environment; Pérez Pino and Rodríguez (2010) make an international panorama, in Cuba and in Havana province; Polo and Brizuela (2006) also address the subject under study but only refer to the optimization of performance in a wheelchair but for racing. So far, there is no particular program for the preparation of these athletes with disabilities, so the coaches improvise the preparation of the pitchers, making adjustments to the comprehensive programs for the preparation of conventional athletes. As can be seen, the bibliography consulted does not specifically address how to teach the Bullet Thrust technique in a wheelchair in athletes with disabilities, all of which allows us to state that there is a lack of theoretical-methodological pathways despite the support of the International Paralympic Committee and functional coaches, athletes, referees and classifiers, necessary for the correct practice of sport and seeking the development of para-sports (Costa Rican Institute of Sport and Recreation, 2020).

It is for all these reasons that this research has the objective of developing a procedure for teaching the technique of the Impulse of the bullet in a wheelchair in athletes with disabilities. The importance of the study lies in the fact that it provides a procedure with methodological steps that serves as a guide to the coaches of athletes with disabilities, for the teaching of the Bullet Impulsion technique in a wheelchair.

Materials and methods

Context, population and sample

The investigation was carried out in the territory of Santa Clara, specifically in the localities where athletes train from the bullet from a wheelchair, as well as in the EIDE ¨Héctor Ruiz Pérez¨ of Villa Clara. The first population was taken as three trainers who in Santa Clara train Bullet Propulsion from a wheelchair plus a trainer from the EIDE ¨Héctor Ruiz Pérez¨ of Villa Clara and a second population made up of the two methodologists who attend Sports for the Disabled in the province of Villa Clara, as well as three specialists from the Faculty of Physical Culture of Villa Clara.

The approach of this study was the dialectical-materialist, since it allowed the use of both the theoretical level methods and the empirical level methods, depending on the nature of the object of study. The theoretical level methods were used: inductive-deductive, analysis and synthesis, and the systemic-structural-functional approach. From the empirical level, the survey, the interview, the criteria of users and group techniques were used, as well as the statistical methods and/or mathematical processing. Survey: it was applied to three coaches who train bullet thrust from a wheelchair in Santa Clara, to gather information on the methodological routes they use to teach the technique with athletes with disabilities. Interview: It was applied to two directors of Athletics in Villa Clara for sports with disabilities, as well as coaches from Santa Clara and a coach from the Comprehensive School of School Sports ¨Héctor Ruiz Pérez¨ for her experience in international competitions as a coach in Namibia. It was applied in order to know their

evaluative criteria on the way in which the Wheelchair Bullet Drive is taught to athletes with disabilities. Recording or audio format was used for recording.

Interactive techniques (workshop): it was carried out to socialize the proposal with the coaches and directors, as well as three specialists from the Faculty of Physical Culture of Villa Clara. User criteria: it was applied to both introducers and receivers, among whom are two members of the Provincial Athletics Commission of Villa Clara and three coaches. They gave their opinion about their satisfaction with the quality, usefulness and feasibility of the proposal. The IADOV Technique was used to evaluate user satisfaction, taking into account the theoretical postulates of Campistrous and Rizo (2006) cited in Fernández and López (2014).

A questionnaire was used that has a total of five questions, three closed and two open, whose relationship is unknown to the subject.

1. Are you satisfied with the result that was obtained related to the steps for teaching the wheelchair shot to athletes with disabilities? Yes___ No__

2. Do you consider that the steps for teaching wheelchair shot put to athletes with disabilities are useful and functional so that coaches can teach in this discipline? Yes___No__

3. Do you like the way the steps for teaching the Wheelchair Shot Put to athletes with disabilities have been designed? Yes____No__

The IADOV technique also contemplates two complementary open-ended questions.

1. What importance do you attach to the proposal?

2. What aspects in your opinion enhance or limit the use of the proposal?

The number resulting from the interrelation of the three closed questions indicates the position of each subject on the satisfaction scale, that is, his or her individual satisfaction. The satisfaction scale used is as follows:

1. Clear satisfaction
2. More satisfied than dissatisfied
3. Not defined
4. More dissatisfied than satisfied
5. Clear dissatisfaction
6. Contradictory

This technique was assumed in this research derived from the IADOV technique, since it also allows obtaining the group satisfaction index (ISG) for which it works with the different levels of satisfaction that are expressed on the numerical scale that ranges between +1 and - 1 in the following way:

Scale	Result
+ 1	Satisfaction Max
0.5	More satisfied than dissatisfied
0	Undefined and contradictory
- 0.5	satisfied
-1	Maximum dissatisfaction

Group satisfaction is calculated by the following formula:

$$ISG=\frac{A\ (+1)+\ B\ (+0.5)\ +\ C\ (0)\ +\ D\ (-5)+\ E\ (-1)}{N}$$

In this formula A, B, C, D, E, represent the number of subjects with individual index and where N represents the total number of subjects in the group.

The group index yields values between + 1 and - 1. Values between - 1 and - 0.5 indicate dissatisfaction; those between - 0.49 and + 0.49 show contradiction and those that fall between 0.5 and 1 indicate that there is satisfaction.

Results and Discussion

Survey results

The answers to question number one of the survey, related to whether they receive guidance from the National Institute of Sports, Physical Education and Recreation (INDER) on how to teach the technique of Throwing the bullet in a wheelchair to athletes with disabilities, the 100% state that they do not receive specific guidance on the teaching of the technique, but they argue that they have received guidance for other aspects related to athletes with disabilities, through seminars. In the case of the answer to question two, related to whether there is any methodological procedure to teach the technique of Throwing the bullet in a wheelchair to athletes with disabilities, they also unanimously state that it is not, arguing that they They teach the technique based on their experiences. In question three, the coach is asked to mark with a cross (x) the source from which they obtain information for the teaching of the technique of Pushing the cleat in a wheelchair to athletes with disabilities, 34% state that literature and 66% from their source of inspiration or experience. However, in previous answers it is clear that specifically they do not have theoretical and methodological routes for teaching the technique to these athletes.

Regarding question four, which inquires about the importance of having methodological steps for teaching the technique of Throwing the bullet in a wheelchair to athletes with disabilities, in its entirety (100%) it is considered very important and they argue that, if they had a procedure with the methodological steps for teaching these athletes, the performance in that discipline would be better. Question five asks about the value that they would give on a scale of one to ten to a group of technical aspects according to their

experience and knowledge as coaches. In this sense, they give the maximum points to the inclination of the trunk and impulsion (final effort) due to the importance it has, as impulsion is the main element and for being the one that takes the longest in teaching-learning. Regarding question six, which inquires about the means they have for the development of the Impulse of the bullet, when marking with an (x) the means they have, 100% say that they have bullets of different weights, 66% state that they have wheelchairs and 66% that they have specialized fixed chairs.

In question seven, the coaches are asked what recommendations they can offer for the development of a better teaching of the Bullet Thrust technique in a wheelchair to athletes with disabilities. In general, they recommend courses, especially based on the teaching of athletes with disabilities in wheelchairs and that studies and research be carried out based on the teaching of the technique.

Results of interviews with methodologists

One of the methodologists of the province of Sports for the Disabled has been in the position since 2013, although he has served as municipal methodologist since 2004 and the other methodologist has been exercising that activity since 2018. Both methodologists manage to specify that for field athletes the classification begins with F and from there are derived those who propel sitting and standing and also highlight that there are many classifications for the Propulsion of the bullet depending on the pathologies.

Both refer that there are no written methodologies for teaching, not only for the Throw of the shot, but for any sport and what is done is to be guided by the Comprehensive Program for the Preparation of the Athlete and make adjustments in this regard in an empirical way.

In the same way, they state that improvement activities are carried out such as workshops, conferences, methodological classes, but since they do not have the bibliography and specialists, this is not entirely effective.

They recommend that studies and research be carried out to implement results of a methodological nature, specific to the types of sport, disability and specialties.

Coach interview results

A coach was interviewed who, due to her international results in the Namibian national team, can provide relevant results. In this regard, she states that she trained athletes with disabilities from F51 to 54.

She confirms that there is no methodology for teaching bullet drive from a wheelchair, so she relied on her experience with conventional athletes. She advises studies and proposals for teaching methodologies to be carried out Procedure used to establish the methodological steps for teaching the technique of the Impulse of the bullet.

The following procedure was followed to establish the methodological steps for teaching the bullet thrust technique:

1- Consultation with the specialized literature on sports for athletes with disabilities in wheelchairs.

2- Analysis of the methodology of teaching the technique of the Impulse of the bullet for conventional athletes.
3- Consultation with Athletics specialists from the Faculty of Physical Culture of Villa Clara.
4- Elaboration of the first proposal of methodological steps for the teaching of the Bullet Impulsion technique.
5- Socialization of the proposal of methodological steps for the teaching of the technique of the Impulse of the bullet with coaches and managers of sports for the disabled.
6- Preparation of the final proposal.

Two workshops were held with Athletics specialists from the Faculty of Physical Culture

First Workshop:

Objective: Assess the proposal with Athletics specialists from the Faculty of Physical Culture of Villa Clara.

Contents to discuss

- ✓ If it has the components of the teaching-learning process.
- ✓ If it is properly structured.
- ✓ If the steps are affordable and accessible.
- ✓ If it is suggestive and enlightening for coaches.
- ✓ If the exercises do not cause problems and aggravate the pathologies

Synthesis of the workshop report.

Once the proposal of methodological steps for the teaching of the Bullet Impulsion technique was presented, they considered that it responds to the objectives for which they were elaborated.

They state that it is suggestive, enlightening and meets the expectations of sports coaches, since it has an adequate structure, is accessible and affordable for athletes, simple to apply and viable, in addition to addressing posture and injury prevention issues.

However, it is suggested that the methodological observations be described more precisely.

Second Workshop:

Objective: Assess the proposal with wheelchair bullet thrust trainers and Disabled Sport methodologists.

Contents to discuss

- ✓ Yes, the proposal solves the current problems related to the teaching of Bullet Propulsion in a wheelchair.
- ✓ If it is affordable and accessible for athletes of that specialty.

Synthesis of the workshop report.

They also consider that the proposal is adequate and was developed through the use of scientific methods.
They state that the proposal solves the current problems related to the teaching of Bullet Propulsion in a wheelchair, it is useful and responds to a practical need.
He suggests that the tasks correspond more to the means available to the coaches of the territory.
Based on the suggestions made in the workshops, the final proposal was formed as shown in table # 1.
Table 1. Methodological steps.

Task	**Phases**	**Activities**	**Methods and means**	**Methodological orientations**
I	Preparation phase and attachment of the implement	-Anchorage of the chair, tied at the waist to these and at the same time the legs so as not to fall or commit a foul. Place the chair in the direction of the drive. -Pass the bullet or ball or other artifact from one hand to the other for weight control. -Propel the bullet upwards with reception in the opposite hand and vice versa. -Teaching the grip and placement of the implement in the clavicular fossa	Throwing chair, balls, small bullets, small medicine balls or other object that allows an adequate imitation.	Fix the chair so that it does not move, as well as the legs of the athlete. The artifacts for the control of the implement must not be very heavy to avoid injuries Explain and demonstrate the grip of the implement according to the age and characteristics of the athlete
II	Final effort or discharge phase	-After a good anchoring of the chair, the shooter grabs the bar fixed to the chair with the hand opposite to the arm to propel the bullet. - Imitation of the discharge or final phase without implement with slight inclination or	Throwing chair, balls, small bullets, small medicine balls or other object that allows	Explain and demonstrate the final effort with the implement according to the age and characteristics of the athlete. Insist on concentrating attention on the output of the implement,

		without backward inclination. -Impulsion of baseballs, softballs or other objects, without leaning the trunk backwards. - Repeat the previous exercise but performing the push with the official implement	an adequate imitation.	extension of the arm and placement of the hand once it is released.
III	Displacement phase in the body's vertical axis	- Pull the bar located on the chair with the opposite arm to the one used to propel the bullet and pull the trunk backwards without an implement -Perform the previous exercise with baseballs, softballs or other objects - Repeat the previous exercise but performing the push with the official implement -Perform the previous exercise but with a rod in front to guide the output of the implement towards the appropriate angle	Throwing chair with the vertical bar, balls, small bullets, small medicine balls or other object that allows an adequate imitation	Make coordinated movements without anticipating and bring the trunk back with the help of pulling the bar and quickly forward taking advantage of the momentum.
IV	Final or discharge phase	- Imitate the final effort without an implement, bending the left arm attached to the bar so that the chest advances and extending the driving arm until the implement is released. -Exercise with light and normal implements, against the wall extending the drive arm	Throwing chair, balls, small bullets, small medicine balls or other object that allows an adequate imitation	Insist that the athlete fully extend the driving arm by turning the wrist outward and push the implement with the fingers

		-Perform the same exercise with a normal implement and a rod in front in search of the appropriate angle, extending the drive arm		

The methodological steps for teaching the Wheelchair Bullet Drive make it possible to guide coaches in the teaching-learning process of this specialty and can be adapted to other classifications, thus improving the conditions of the teaching-learning process for athletes and coaches. . Once the data of the questions to the users have been processed according to the IADOV technique, which yielded an index of 0.98, this allows us to state that there is high satisfaction with the proposal in terms of quality, usefulness and viability.

Conclusions

Based on the difficulties detected and the diagnosis made, a procedure was elaborated with methodological steps consisting of four phases, activities, methods and means, as well as methodological guidelines to teach the technique of teaching the Impulse of the bullet in a wheelchair. for athletes with disabilities.

Athletics users and specialists consider that the methodological steps proposed for teaching wheelchair shot put to disabled athletes are useful, feasible and necessary to improve the results of this athletic discipline.

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