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Effects of ABC Running and Bodyweight Training combination: A case study on the speed of hurdling athletes

Efectos de la combinación ABC Running y Bodyweight Training: Un estudio de caso sobre la velocidad de los atletas de vallas

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Abstract. The use of exercise in sports must be right on target on the physical component needed. Similarly, hurdling not only utilizes speed, but requires strength to get maximum results. The purpose of the study was to analyze the effects arising from the use of Running ABC exercises combined with Bodyweight Training. The study design used a two-group post-test pre-test of 22 trained male subjects enrolled in the study. The first stage includes initial tests to see initial ability and as a basis for determining the treatment group which is divided into two groups with ordinally paired patterns A-B-B-A for group alignment. Group 1 was given Running ABC exercises, and Group 2 Running ABC exercises were combined with Bodyweight Training. Each group was trained for 16 meetings. The test instrument used is a 50yard sprint over obstacles by measuring the speed of the athlete's travel time. The data analysis technique used was a difference test with IBM SPSS 24 statistics. The results of the study were obtained from data analysis there was a significant difference between group 1 who only used Running ABC exercises with group 2 who used Running ABC exercises combined with Bodyweight Training exercises with a difference value of 0.043<0.05. This means that running abc (agility, balance, and coordination) and body weight training are significant in increasing the running speed of hurdling athletes, but combining body weight training and running abc (agility, balance and coordination) is more effective than training using only one type of physical component exercise. By combining running abc exercises and body weight training, trainers can improve their athletes' overall fitness and technique, effectively improving balance, coordination, and functional strength.
Keyword: Exercise, Bodyweight Training, Running ABC, Hurdles.

Resumen. El uso del ejercicio en el deporte debe ser justo en el objetivo en el componente físico necesario. Del mismo modo, las vallas no solo utilizan la velocidad, sino que requieren fuerza para obtener los máximos resultados. El objetivo del estudio fue analizar los efectos derivados del uso de ejercicios Running ABC combinados con Bodyweight Training. El diseño del estudio utilizó una prueba previa de dos grupos de 22 sujetos masculinos entrenados inscritos en el estudio. La primera etapa incluye pruebas iniciales para ver la capacidad inicial y como base para determinar el grupo de tratamiento, que se divide en dos grupos con patrones ordinalmente pareados A-B-B-A para la alineación del grupo. Al grupo 1 se le administraron ejercicios de Running ABC, y al grupo 2 se le administraron ejercicios de Running ABC se combinaron con entrenamiento de peso corporal. Cada grupo fue entrenado para 16 reuniones. El instrumento de prueba utilizado es un sprint de 50 yardas sobre obstáculos midiendo la velocidad del tiempo de viaje del atleta. La técnica de análisis de datos utilizada fue una prueba de diferencias con estadística IBM SPSS 24. Los resultados del estudio se obtuvieron a partir del análisis de los datos, existió una diferencia significativa entre el grupo 1 que solo utilizó ejercicios de Running ABC con el grupo 2 que utilizó ejercicios de Running ABC combinados con ejercicios de Bodyweight Training con un valor de diferencia de 0,043<0,05. Esto significa que correr abc (agilidad, equilibrio y coordinación) y el entrenamiento con el peso corporal son importantes para aumentar la velocidad de carrera de los atletas con vallas, pero combinar el entrenamiento con el peso corporal y el abc (agilidad, equilibrio y coordinación) es más efectivo que entrenar con un solo tipo de ejercicio físico. Al combinar los ejercicios de running abc y el entrenamiento con peso corporal, los entrenadores pueden mejorar el estado físico y la técnica general de sus atletas, mejorando efectivamente el equilibrio, la coordinación y la fuerza funcional.
Palabras clave: Ejercicio, Entrenamiento con el peso corporal, ABC de la carrera, Obstáculos.

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Introduction

Athletics is one of the most popular sports in the world of sports. Athletics is one of the sports that is always competed in every international Olympics (Houlihan & Zhenga, 2016). In athletics, it consists of several competition numbers, including hurdles. Hurdles race requires the speed of the athlete to run a certain distance by passing several wickets/obstacles (Jones et al., 2021). In the implementation of hurdles, an athlete must have several main physical components such as speed, accuracy, and strength (Kiram et al., 2023). With so many physical components needed that hurdling athletes must do targeted training (Sato et al., 2020).

Some coaches have analyzed and applied various forms of exercise to improve the physical components of their athletes (Alecu & Ionescu-Bondoc, 2018). However, some existing exercises have not been maximized properly (Kraemer & Ratamess, 2004). Some forms of training are done for hurdling such as ABC Running training, Obstacle Step training, sprinting training, strengthening exercises, and many other exercises (Setyantoko et al., 2019). ABC exercises (agility, balance, coordination) can affect several other physical and cognitive aspects such as cardiorespiratory, motor, improved focus and concentration, and communication skills (Vandoni et al., 2024). The problem that often arises in the use of training for hurdling is that it is only focused on one form of physical condition training (Lustig et al., 2009). Coaches only sometimes focus on the

speed of the athlete without considering other physical conditions such as accuracy and strength (Rifki et al., 2023). In addition, other physical conditions needed in the implementation of hurdles are explosive power and balance (Abi Permana et al., 2022).

In the world there have been many types of hurdling training offered by various scientists in the field. Among them are forms of exercises designed by (Rowley et al., 2021) related to obstacle step strategy exercises. The exercise only focuses on the accuracy of steps in passing obstacles without looking at the main goal of hurdles, namely speed, which aims to increase the speed of basic techniques in doing hurdles. However, the form of exercise only focuses on applying the right basic techniques (Arjona & Espinel, 2023), so that it will have little effect on speed. The use of proper training techniques in hurdles must pay attention to speed and strength techniques. One application of strength training has been used by (Patoz et al., 2023) namely the use of dynamic body weight training. For this exercise is widely used by top athletic trainers in the world but the constraints on this exercise have not been scientifically proven in increasing speed. In addition, Many other studies have to do with agility, balance and coordination training (Dwi & Agustan, 2021) and volume of oxygen maximal, but these studies only refer to one physical condition (Ibrahim et al., 2023). Have conducted research combining plyometric training and sled training but only on football athletes (Falces-Prieto et al., 2021). Sled training is a fitness training method that involves the use of a sled or cart that is pulled or pushed to increase the strength, endurance, and speed of the athlete.

From the results of the analysis of several forms of exercise that have been described, there are still many obstacles found in the exercise given. Currently researchers are trying to provide an exercise solution that combines several physical conditions. This is to support previous studies. The form of exercise given is the combination of Running ABC exercises with Bodyweight training. In some previous studies stated that with running abc exercises can increase speed with improvements in basic techniques (Pizà-Mir et al., 2022). While bodyweight training will support the strength and balance of athletes when running through obstacles. Training for hurdlers in athletics that is an interesting novelty here is integrating running abc exercises with body weight training into the training program. With the integration of such exercises can increase the initial strength of the athlete, increase stability and balance, increase speed and reaction, and have a different variant of training than before.

Combining abc (agility, balance, and coordination) training with bodyweight training is a good choice because the two exercises can provide complementary benefits and strengthen different aspects of physical fitness. These two exercises combined will have an impact on the balance between strength and motor skills, improved technique, injury prevention and functional strength development (Welis, 2024).

Therefore, the initial analysis of researchers sought to provide a form of exercise that combines speed, balance and strength so as to produce good explosive power. This explosive power can contribute greatly to the improvement of the ability in the athlete's hurdles. In addition, the purpose of this study can later be used as a reference for all athletic trainers, especially in hurdles. To achieve this goal, it is very important to analyze new forms and models of exercise that can accommodate all the physical conditions needed.

Material and Method

Participant

The subjects of the study were 22 male athletes trained in athletics (aged 17-22 years) selected using puposive sampling techniques. The athletes have been selected and agreed to be analyzed for their basic abilities to be given additional training in the form of running ABC and bodyweight training given to each group. The samples were divided into two groups with a paired ordinal system.

Procedurs

The subjects of the study were analyzed by giving preliminary tests for the determination of the group to be divided into two. Preliminary test results are analyzed and arranged in order of fastest to late. Next is to divide the two groups based on the ordinal paired using the A-B-B-A pattern so that the ability between groups is the same (Waffak et al., 2022). Next is to treat the research subjects with different exercises. The exercise given to group one was Running ABC exercise, while for group two was given Running ABC exercise combined with bodyweight training.

The treatment was given for 16 exercises and at the end a final test was given to compare between the initial ability and the final ability after receiving the treatment. The forms of Running ABC exercises include Angkling, Knee up, Kicking, Heel butkick, Hoping. As for bodyweight training, among others: Squat sumo, Wall squat ishold, Skater squat, Pistol squat, Reverse lunge (Prieto González & Sedlacek, 2021).

Instrument

The test instrument was conducted using a 50yard sprint test with construct validity and reliability of 0.94 (Golle et al., 2015). This instrument aims to measure running speed by measuring the time successfully traveled at a predetermined distance.

Statistical Analysis

Statistical analysis used IBM SPSS statistical 24 software with the use of difference test data analysis techniques to verify differences in technical variables between the two treatment groups. A significant level has been set at Sig $\leq$0.05.

Result

Based on the results of research that has been done, preliminary test result data has been obtained which has been grouped into two groups based on the results of athlete speed whining. In group one was given speed training treatment with Running ABC exercises for 16 exercises. The following results of the initial test and final test with treatment using Running ABC exercises are shown in the following graph I. The selection of demographic samples is key in research so that the exercise program is in accordance with the needs and goals of the group. The selection of demographic samples that are taken into consideration is male hurdles athletes who have participated in several competitions, have the same location and area, and are willing to follow all the training programs given.

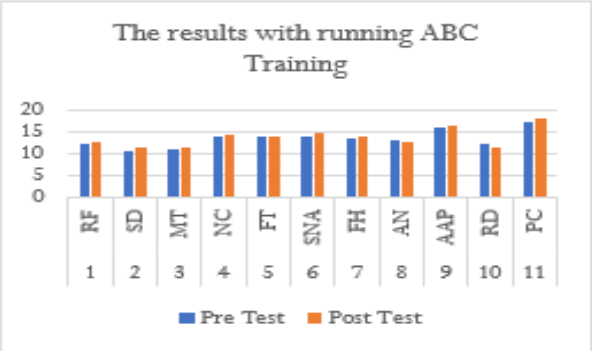

Figure 1. ABC running treatment group test results

As for the results of the initial test and the final test, group two was given a combination of Running ABC exercise treatment with bodyweight training exercises contained in the following graph II:

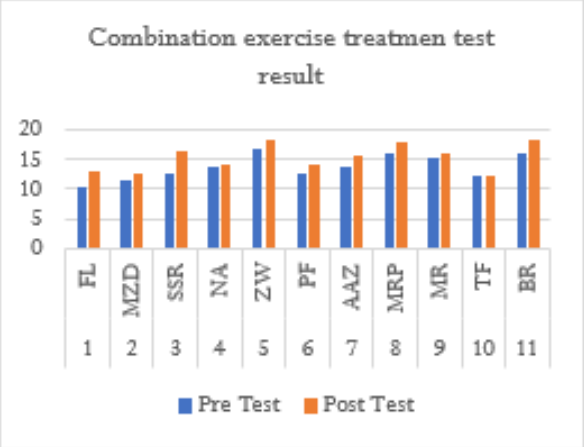

Figure 2. test results group 2 treatment Running ABC combination Bodyweight Training

Based on the results of the tests that have been carried out, significant differences were obtained between the initial test results and the final test after giving treatment in the form of combination exercises. Furthermore, from the results of the data, data analysis was carried out using different tests with results that can be seen in table I as follows:

Table 1.
Results of the Difference Test analysis

Independent Samples Test										
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Result	Equal variances asumed	.763	.393	-2.155	20	.043	-1.28909	.59807	-2.53665	-.04153
	Equal variances not asumed			-2.155	17.757	.045	-1.28909	.59807	-2.54683	-.03135

Based on the results of the analysis using the difference test analysis between the 2 treatment groups, data were obtained that the Sig value was 0.393 > the Sig level was 0.05, which means that the data variance is the same or homogeneous. Furthermore, the Sig (1-tailed) value of 0.043 < Sig. level 0.05 which means that there is a significant difference between the results of the implementation of group 1 and group 2 exercises with overall results it can be stated that training with a combination is much better than training that only focuses on one physical condition in this case is only speed training with abc training (agility, balance, coordination).

Discussion

Starting from several previous studies, a recent study has been conducted that is different from before where this latest study tries to combine two different forms of exercise, namely speed training and strength training consisting of five exercise items each that will be designed in one exercise program. It is also based on various analyses that have been done by previous researchers such as motion analysis (Amara et al., 2019). In addition, what distinguishes this study is that the running number used is a hurdle running number that is known to have more difficulty than other running numbers in athletics.

Based on the data from the research previously described, it can be found that the use of ABC running training methods (Ferrauti et al., 2010) and combination training with bodyweight training (Schaun &; Alberton, 2022) both have a significant influence on increasing the speed and strength of running athletes. Because strength and speed become one element of physical conditions that can affect other physical components (Chan, 2012). The combination of physical conditions of speed and strength will produce a good explosive power (Arianda et al., 2021). This explosive power plays an important role in the process of carrying out the main goal run when making an early star

and when repulsing to pass obstacles. The results of different tests obtained from research with two groups given different treatments obtained results with Sig. 0.393 > Sig. 0.05 levels which means that the data has been homogeneous. From the difference test, the value of Sig. (1-tailed) 0.043 < Sig. 0.05 which means that there is a significant difference between the first treatment group and the second treatment group. This means that treatment with a combination of ABC running exercises with bodyweight training is better than using only ABC running exercises. This supports previous theories that state that ABC running exercises have an influence on speed and also bodyweight training that has an impact on increasing the strength of running athletes.

Training abc (agility, balance and coordination) running based on the results of research also shows that the use of this method can increase speed. This happens because there is an increase in muscle strength so that it can produce greater power (Suárez, 2023). The exercise can also improve endurance and coordination while running so that it can maintain speed consistently (Ardiansyah et al., 2024). With regular and consistent training, athletes can improve flexibility and coordination that contribute to running speed.

Analysis obtained from the treatment of two different types of exercise illustrates that training for running athletes is not enough just with speed training (Marques et al., 2015). But with a combination of speed and strength training will have a better impact (Galiano et al., 2022). To obtain maximum speed, you must pay attention to factors that influence it such as strength, reaction time, and running technique (Gusril et al., 2022). With the development of exercises by combining several major physical conditions that are right will have a good impact on improving the performance of athletes.

A combination bodyweight training program with running ABC (Agility, Balance, Coordination) can have several positive effects on speed including bodyweight exercises, such as squats, lunges, and jumping exercises, can increase leg muscle strength. The sustainability of this exercise can help in releasing more energy while running (García-Flores et al., 2023) thus increasing speed. Agility training helps improve the ability to move quickly and efficiently through changes in direction. This can be helpful in running situations on the track or when passing obstacles, which can affect overall speed. ABC exercises such as skipping, high knees, and ladder drills can improve coordination and running technique (Sortwell et al., 2021). By improving coordination and technique, it can maximize the efficiency of movements and thus increase speed. In addition, some bodyweight exercises, such as squat jumps, can aid in the development of muscle explosiveness. This can contribute to the ability to generate maximum speed when running as well as when passing obstacles (Yuniana et al., 2024).

When combining abc running training and body weight training, you will benefit from two different but complementary types of exercise (Bagheri et al., 2023). With the combination of the two exercises, it can create a comprehensive new exercise program by developing various aspects of physical fitness needed to increase speed (Aban et al., 2023). These include functional strength, balance, coordination, motor response, as well as aerobic and anaerobic capacity. All these factors will work together to improve the ability to move at high speed, efficiency and maximum.

Incorporating interval training, can help improve the capacity and ability of the physical component (Patiño et al., 2023). This can provide the added advantage of increasing speed. It is important to note that to see significant results, consistency in exercise and progressiveness (gradual increase in exercise intensity) are essential. In addition, strength and speed training must be balanced with adequate rest and recovery to prevent injury (Purnomo et al., 2021).

It is highly recommended in future studies to combine various other forms of exercise based on the physical component needed in sports, not only in athletics but can also be done in other sports.

Conclusions

ABC running training has a significant effect on increasing speed in hurdle athletes. Likewise with ABC running exercises combined with bodyweigh training exercises. However, in analysis, ABC running exercises combined with strength training, bodyweight training are more effective and better for increasing the running speed of hurdle athletes.

Conflik of interest

No conflict of interest with any person, company, or institution.

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