

# The Impact of Workout Training Program towards Physical Performance of Athletes

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# The Impact of Workout Training Program towards Physical Performance of Athletes

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**Abstract:** All over the world, many trainers and physical education teachers do not pay attention to the importance of assessing the physical capacities of athletes and its consequence on the physical performance of athletes. Of these, the primary purpose of this study is to examine the impact of the workout training program on physical performance of athletes through  $VO_2\text{max}$  and the muscle power of the lower limbs in various sports disciplines. This study designed using a quantitative approach and involved as much as 56 athletes from seven special sport disciplines such as Beach volleyball, Pencak silat, cycling, climbing, girl rugby, roller skating, and Taekwondo. The respondent selected using random sampling technique with playground test (1) beep test to assess  $VO_2\text{max}$ ; (2) vertical bounce to assess the muscle power. The data analyzed using descriptive and inferential statistics. The results of the sprint test found that 31 athletes are low category, 3 athletes are high level; 16 is the ideal category; 6 athletes are classified as a very low category. For the vertical jump test, the result showed that 6 athletes are excellent category, 26 athletes are medium level, 10 classified as good level, and 13 athletes are low level. In addition, the results of this study also found that there is a significantly different value of  $VO_2\text{max}$  between Cycling, Volleyball, Climbing and Roller skating with Pencak silat. Further, the value of  $VO_2\text{max}$  has significantly different between Taekwondo and Female Rugby with Water polo and also Cycling and Roller skating. In conclusion, the sports athlete needs a good physical performance such as cardiorespiratory endurance ( $VO_2\text{max}$ ) and muscle power.

**Keywords:** Workout training program, physical performance,  $VO_2\text{max}$ , muscle power

## Introduction

In the scientific field, cardiorespiratory endurance has long been recognized as one of the fundamental elements of physical performance [1]. In other words, the cardiorespiratory system can maintain a prolonged effort. Thus, cardiorespiratory endurance is a determining factor, in many sports like football, basketball, handball, rugby, athletic, volleyball, Pencak silat and others. From a physiological point of view, this type of effort mainly involves the aerobic process of providing ATP. Several researchers have studied the subject, who relate inter-individual variances in the aerobic endurance performance [2]. This work, therefore, made it possible to subdivide cardiorespiratory endurance into three main variables: the  $VO_2\text{max}$ , the lactate threshold (LT) of the English lactate threshold, and the labor economy or race economy (RE) of the English running economy [3].

The  $VO_2\text{max}$  is the best-known element for cardiorespiratory endurance. It is defined as the highest rate of oxygen the body can consume and use [4]. In other words, it is the total oxygen that an individual can utilize during high-intensity physical exercise. Thus, the more the intensity of the activity will increase, the more the heart rates and the use of oxygen will be important for the sportsman. At a given moment, the athlete's oxygen consumption no longer increases, levels off and stabilizes despite the increase in the workload. The athlete thus reaches his maximum volume of oxygen. For several years, physical trainers of several power sports have understood the importance of training in bodybuilding, especially in rugby, karate, athletic and others [5]-[6]. Indeed, many sports involve athletes with impressive body mass. Different athletes, faced with their consumption of  $VO_2\text{max}$ . First of all, by looking at some studies setting out the profile of the footballer, it has been reported that the maximum volume of oxygen for elite football players in average values is between 56 and 69 ml/kg/min [7].

The performance of an athlete depends on several factors which combine to facilitate the very rapid gain of a competitor; each athlete needs physical capacities which are in good condition to expect a high-level performance. Bodybuilding has five main contraction regimes or groups that fall into two groups: the static contraction group and the dynamic contraction group. The isometric regime is included in the static contraction group and the other four in the dynamic contraction regime. An athlete needs the regime of dynamic contractions without any consideration in that discipline [8].

In general, to help the athlete to have a high performance, the trainers need to combine the training as strength training improves musculoskeletal strength, muscle mass, bone mass, and the thickness of connective tissue [9]. Therefore, training can reach high performance. We must take into account many elements such as strength,  $VO_2\text{max}$ , speed, resistance, endurance, elasticity, toning of muscles. Note that a significant part of the improvement in the ability

to lift loads is due to an increase in the ability to coordinate other muscle groups involved in the movement, such as the body's stabilizing muscles [10].

Strength is the most athletes' capacity; without it, there is no movement. The training result in adaptation is known as neurological adaptations. These adaptations generally concern the contractile system, which can be expressed in an increase in force or more in power [11]. Neurological adaptation thus depends on several factors, including the initial position, the speed of stretching, the speed of shortening, the initial eccentric phase, the types of muscle fibres, the number of motor units activated at the same time, the region of the muscle cross-section, the frequency [12].

Pulses and available substrates for the muscle used [13]. During weight training, the adaptations that may occur result in several effects. Some studies explain that anabolic effects. That is to say, the increase in the synthesis of the protein and the degradation ratio of this protein, generally occur after a muscular contraction associated with training [14]. Other research explains that muscle hypertrophy is one of the effects of strength training, where a connection between the cross-section of the muscle and the potential for force development occurs [15]. The author adds that a muscle can lift on average 6 kg per cm<sup>2</sup> of section. If part of the muscle increases, its strength also increases. It would be interesting to grasp the components involved in these types of training.

Indonesia is a large country, and whose competitive sport takes a long time, physical education is taught almost in the country. Still, a question arises is that the trainers and physical educators do the test of the physical capacities of the athletes during their training or learning? Until now the rate of athletes who manage to have a high-level performance is not sufficient reason why a study on the physical capacities of athletes will be conducted to kindly know if athletes meet the conditions that allow them to acquire a high-level performance. This research focuses on several physical tests like VO<sub>2</sub>max, strength for different discipline: cycling, Pencak silat, Beach volleyball, female rugby, roller skating, martial art Taekwondo, climbing, and water polo. This research is significant because it will show the current status of Indonesia athlete. Secondly, it will help trainers and physical education to know the strengths and weakness of their daily activities to their athletes

## Methodology

This research is designed using a quantitative approach. A total of 56 athletes from seven special activity disciplines like Beach volleyball, Pencak silat, cycling, climbing, female rugby, Taekwondo, roller skating, and water polo have participated in this study and collected by using the random sampling technique. The data collection involved the playground test such as Beep test to assess VO<sub>2</sub>max and vertical jump to check the muscle power of athletes. The data analyzed by assisting statistical software, namely SPSS-23.

### Procedure of Beep test

This test involves continuous running between two lines 12.5 m apart in time to recorded beeps. For this reason, the test is also often called the 'beep' or 'bleep' test. ... After about one minute, a sound indicates an increase in speed, and the beeps will be closer together. It continues each minute: (1) place markers 20 meters apart, (2) position yourself, or athletes, at one of the markers, (3) press the start button of the Beep Fitness Test app, (4) run 20 meters to the opposite marker, getting there before the next beep sounds, (5) wait there until the beep sounds before running back to the other marker. The test is made up of 23 levels, where each level lasts approximated one minute. Each level comprises of a series of 20m shuttles where the starting speed is 8.5km/hr and increases by 0.5km/hr at each level. On the tape, a single beep indicates the end of a shuttle and 3 beeps indicates the start of the next level.

### Procedure vertical jump

Two types of jumps were evaluated: - the squat jump (SJ) with a start flexed at 90 ° and hands on the hips. - the countermovement jump (CMJ) with starting knees extended, bending up to 90 °, extension knees followed by jumping, all with hands-on-hips. Three to four attempts for each type of jump were made by asking the athlete to jump as high as possible. The best essay at the SJ and then at the CMJ was selected. The athlete had a minute of rest between each trial. The vertical jump result will be compared to the following standards: 45 to 55 cm categorized as a medium, 55 to 65 cm is good, and 65+ is excellent

## Results

The results of the interview with 30 physical education teachers in elementary schools are presented in Figure 1. The results will then be compared by standard measurements of researchers like Ruffier and others to stratify or know the level of capacities that the Indonesian athletes have on the qualities of the strength of the lower limbs and the cardiorespiratory endurance VO<sub>2</sub>max. The VO<sub>2</sub>max will be compared on the American of Heart Association (AHA) VO<sub>2</sub>max standards. Below is presented the Ruffier' vertical jump indicator to assess the low limbs' power.

**Table1.** The result of the normality testing for VO<sup>2</sup>max using One-Sample Kolmogorov-Smirnov Test

		A	B	C	D	E	F	G	I
N		7	7	7	7	7	7	7	7
Normal Parameters <sup>a,b</sup>	Mean	34.2771	38.4729	37.3971	40.5571	40.8143	39.4186	35.0886	48.6000
	Std. Deviation	4.33206	2.86165	3.59882	5.46074	2.24828	4.77606	4.50277	6.88791
Most Extreme Differences	Absolute	0.277	0.295	0.202	0.166	0.277	0.147	0.286	0.153
	Positive	0.188	0.295	0.150	0.137	0.277	0.147	0.197	0.153
	Negative	-0.277	-0.232	-0.202	-0.166	-0.152	-0.126	-0.286	-0.133
Test Statistic		0.277	0.295	0.202	0.166	0.277	0.147	0.286	0.153
Asymp. Sig. (2-tailed)		0.112 <sup>c</sup>	0.066 <sup>c</sup>	0.200 <sup>c,d</sup>	0.200 <sup>c,d</sup>	0.113 <sup>c</sup>	0.200 <sup>c,d</sup>	0.087 <sup>c</sup>	0.200 <sup>c,d</sup>

Table 1 displays the results of the normality of VO<sup>2</sup>max data by using One-Sample Kolmogorov-Smirnov Test. It designed to test the distribution of data by comparing your data point with the same mean and standard deviation of your sample. If the test is NOT significant, then the data is normal, or when value significant value above 0.05, it indicated that the data is normally distributed.

Table 2 displays the results of the sprint test found that 31 athletes are low category, 3 athletes are high level; 16 is the ideal category; 6 athletes are classified as a very low category. On the seven prototypes of sports activities branches that we took at random to consider cardiorespiratory VO<sup>2</sup>max and the muscular power of the lower limbs, we can see that the nature of the game is a function of the enhancement of the physical performance. For the vertical jump test, the result showed that 6 athletes are excellent category, 26 athletes are medium level, 10 classified as good level, and 13 athletes are low level. In other words, the physical education teachers and the coach's trainers need to improve their training program to allow their athletes to reach the fastest a good performance

### Climbing

The effects determined on mountaineering have shown that athletes in the Yogyakarta region preserve a moderate stage on the vertical jump. In the hand of VO<sup>2</sup>max, it holds a low category. It is the effect of a very susceptible muscular power. Usually, a mountain climbing athletes, they have a very high cardiorespiratory, and the muscular energy.

### Cycling

Athletes in the Yogyakarta vicinity who cycle, the outcomes have proven that the depth used for the duration of training is not effective, now not solely on the intensity aspect but on the other hand the coaching load does no longer meet the need for athlete what makes that at some point of the competitions one receives can of an athlete who comes in the area of Yogyakarta which gains the victory. It is a query for reviewing the coaching that these athletes do to discount an actual score. Coaches must do an investigation to carry a menu that will benefit their athlete. The assessment tests like the pretest and posttest are tons higher influenced to know the weakest and strongest factors of the athlete while cardiorespiratory and low limbs muscle power are the great capacity for cyclist. We cannot expect to win while the training is not suitable for the carrier.

**Table 2.** The result of the Sprint and Vertical Jump test

Discipline	Subjects	VO2Max	Decision/ VO2max Test	Vertical Jump Test cm	Decision/ Vertical Jump Test
Cycling	7	27.75	Very low	36	Low
		31.22	Very low	38	Low
		37.28	Low	52	Medium
		38.60	Low	50	Medium
		30.53	Very low	59	Good
		37.94	Low	66	Excellent
		36.62	Low	43	Low



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Volleyball	7	38.92	Low	74	Excellent
		36.62	Low	77	Excellent
		33.94	Low	52	Medium
		43.43	Good	68	Excellent
		38.60	Low	70	Excellent
		38.9	Low	75	Excellent
Climbing	7	38.9	Low	56	Good
		35.28	Low	64	Good
		35.28	Low	49	Medium
		38.60	Low	56	Good
		38.92	Low	45	Medium
		40.5	Low	47	Medium
Taekwondo	7	41.8	Low	48	Medium
		31.4	Very Low	41	Low
		48.11	Good	65	Good
		43.12	Good	54	Medium
		30.87	Very Low	60	Good
		40.87	Low	49	Medium
Female Rugby	7	37.28	Low	45	Medium
		43.75	Good	55	Good
		39.9	Low	45	Medium
		44.9	Good	40	Low
		39.6	Good	48	Medium
		41.8	Good	38	Low
Roller skating	7	39.6	Good	37	Low
		39.6	Good	40	Low
		38.2	Good	55	Medium
		42	Good	37	Low
		47.50	Good	69	Excellent
		40.23	Low	45	Medium
Water Polo	7	34.61	Low	46	Medium
		33.94	Low	59	Good
		42.80	Low	49	Medium
		36.95	Low	44	Low
		39.90	Low	63	Good
		40.55	Low	58	Good
Pencak silat	7	34.61	Low	50	Medium
		34.28	Low	55	Medium
		36.95	Low	51	Medium
		36.62	Low	52	Medium
		36.62	Low	46	Medium
		25.99	Very low	56	Good
	7	44.5	Good	47	Medium
		38.9	Low	38	Low
		47.7	Good	46	Medium
		44.5	Good	46	Medium
		50.8	Very good	45	Medium
		59.5	Very good	44	Low
	7	54.3	Very good	66	Excellent

### Pencak Silat Indonesian Martial Art

The effects of Pencak silat showed the good value in the hand of cardiorespiratory. Pencak silat, a very recognized self-discipline of Indonesian origin, is an awful lot more favourable for improving the physical characteristics of an athlete. The pieces of training of this discipline are entire, and therefore they desire very well the significant development of the VO2max and the muscular power of the lower limbs.

### Volleyball

Volleyball is a game that helps seriously change your body. With volleyball, the participant refines his silhouette, gains muscle and tone, his thighs and his abdominals are reinforced in specific thanks to the acceleration phases. Indeed, the advantages of volleyball on the physical and mental are undeniable. On the one hand, it permits you to: Stimulate your cardiovascular and respiratory capacities as properly as your endurance. Improve speed, agility and reflexes. The nature of the sport of volleyball favors an athlete of any discipline to kindly improve speed and muscle strength as an end result of his multidirectional reactions.

## Female Rugby

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 Knowing that the cardiorespiratory endurance or VO2max, speed and the muscular power of the lower limbs are among the most important qualities that a rugby player must have, the results of research have proved that for women's rugby in Indonesia their training was highly good because all participants have a good cardiorespiratory even though in the side of lower limbs muscle power it still an need to improve. You cannot hope to defeat a rugby match or championship if the physical conditions are still weak since rugby requires full body. Rugby players need to have different levels of strength, cardiorespiratory endurance or VO2max, power, endurance, speed and agility. For example, a player must develop a good general base in terms of strength, stability, mobility and resistance on which he will rely to increase his qualities of speed and power.

## Taekwondo

Taekwondo includes higher kicking than karate. It puts a heavier emphasis on kicks and makes use of palms as a backup. Because karate uses many extra hand attacks, legs regularly stay grounded. Taekwondo, on the different hand, uses a distinct leg stance because the body wishes to be geared up to perform fast kicks. In this research, the result showed that Taekwondo was a good discipline to improve cardiorespiratory or VO2max. Its nature allows also developing lower limbs muscle power.

## 10 Water Polo

Water polo is now popular in many countries around the world, notably Europe (particularly in Croatia, France, Germany, Greece, Hungary, Italy, Malta, Montenegro, the Netherlands, Romania, Russia, Serbia and Spain), Australia, Brazil, Canada and the United States. Increased Endurance- Water polo players can swim upwards of 5 kilometres in a game. Weight Loss- Players can burn up to 700 calories per hour of play. Improved Cardiovascular Health. Improved Strength. From the result above showed that the training of Indonesia athletes was not effective. That's why the VO2max still low, but also their muscle power is classified in the low category. This study will help trainers and physical education teachers from Indonesia to do the pretest and posttest of athlete' physical fitness to join the high performance.

## Roller skating

The deep analysis showed that all the roller skating have a low VO2max, and their lower limbs muscle power was also not in the good category. In contrast, many studies have shown that roller skating provides a complete aerobic workout and involves all of the body's muscles, especially the heart. Roller skating is equivalent to jogging in terms of health benefits and caloric consumption, reduction of body fat, and leg strength development. Both indoor and outdoor roller skating are great ways to burn calories. Skating is a cardiovascular activity. It gets the heart working harder, it works up a sweat, and if you skate regularly and follow a healthy diet, you'll soon see the fat melt away. Skating to lose weight is an effective method of getting healthy. Roller-skating is a great way to improve heart health, strengthen muscles, and burn calories. It works muscles in the legs, glutes, and core, burns about 600 calories an hour, and causes 50% less stress to the joints than running. It even improves flexibility and endurance. In general, for every coach trainer or physical education teacher, he needs to follow all the stages of training like pretest and posttest to assess the athlete' progress (See Table 3).

**Table 3.** The result of the VO<sup>2</sup>max test for different sport disciplines

		Paired Differences					t	df	Sig. (2-tailed)
		16 Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	A - B	-4.19571	4.76848	1.80231	-8.60582	.21439	-2.328	6	0.059
Pair 2	A - C	-3.12000	4.97389	1.87995	-7.72008	1.48008	-1.660	6	0.148
Pair 3	A - D	-6.28000	8.33055	3.14865	-13.98448	1.42448	-1.995	6	0.093
Pair 4	A - E	-6.53714	5.74332	2.17077	-11.84883	-1.22546	-3.011	6	0.024

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Pair 5	A - F	-5.14143	8.91944	3.37123	-13.39053	3.10768	-1.525	6	0.178
Pair 6	G - A	.81143	7.46406	2.82115	-6.09167	7.71453	0.288	6	0.783
Pair 7	A - I	-14.32286	6.26113	2.36648	-20.11344	-8.53228	-6.052	6	0.001
Pair 8	B - C	1.07571	4.42099	1.67098	-3.01302	5.16445	0.644	6	0.544
Pair 9	B - D	-2.08429	4.80520	1.81620	-6.52836	2.35978	-1.148	6	0.295
Pair 10	B - E	-2.34143	3.95418	1.49454	-5.99844	1.31558	-1.567	6	0.168
Pair 11	B - F	-.94571	5.67655	2.14553	-6.19565	4.30422	-0.441	6	0.675
Pair 12	B - G	3.38429	4.90605	1.85431	-1.15306	7.92163	1.825	6	0.118
Pair 13	B - I	-10.12714	7.29457	2.75709	-16.87349	-3.38079	-3.673	6	0.010
Pair 14	C - D	-3.16000	7.14320	2.69987	-9.76636	3.44636	-1.170	6	0.286
Pair 15	C - E	-3.41714	5.26468	1.98986	-8.28616	1.45187	-1.717	6	0.137
Pair 16	C - F	-2.02143	6.91629	2.61411	-8.41793	4.37508	-0.773	6	0.469
Pair 17	C - G	2.30857	3.75530	1.41937	-1.16450	5.78164	1.626	6	0.155
Pair 18	C - I	-11.20286	6.79854	2.56961	-17.49046	-4.91525	-4.360	6	0.005
Pair 19	D - E	-.25714	5.53631	2.09253	-5.37738	4.86309	-0.123	6	0.906
Pair 20	D - F	1.13857	4.80230	1.81510	-3.30282	5.57996	0.627	6	0.554
Pair 21	D - G	5.46857	5.65673	2.13804	.23696	10.70018	2.558	6	0.043
Pair 22	D - I	-8.04286	9.24361	3.49376	-16.59177	.50606	-2.302	6	0.061
Pair 23	E - F	1.39571	3.94683	1.49176	-2.25450	5.04593	0.936	6	0.386
Pair 24	E - G	5.72571	4.92622	1.86194	1.16972	10.28171	3.075	6	0.022
Pair 25	E - I	-7.78571	7.80565	2.95026	-15.00473	-.56670	-2.639	6	0.039
Pair 26	F - G	4.33000	5.62143	2.12470	-.86896	9.52896	2.038	6	0.088
Pair 27	F - I	-9.18143	8.97592	3.39258	-17.48277	-.88009	-2.706	6	0.035
Pair 28	G - I	-13.51143	9.30249	3.51601	-22.11479	-4.90806	-3.843	6	0.009

Note: Cycling(A), Volleyball (B), Climbing (C), Taekwondo(D), Female Rugby (E), Roller skating (F), Water polo(G), Pencak silat (I)

The deep analysis of this table has suggested that the training done at Pencak silat seems beautiful and very beneficial on the VO<sub>2</sub>max of athletes. The nature of a sport is a function of performance. The results show a significant difference in VO<sub>2</sub>max in Pencak silat athletes compared to others. In short, the Pencak silat a particular discipline of Indonesian origin can be used to improve the physical capacities of other sports disciplines.

Table 4 shows the average VO<sub>2</sub>max of the different disciples, and we notice a high average among athletes of Pencak silat (48.6) and rugby (40.81) which makes or confirms that the training done in these disciplines is more or less favourable to improve physical capacities athletes.

**Table 4.** The result of descriptive statistics by using the One-Sample Statistics

Std. Deviation	Std. Error Mean
4.33206	1.63737
2.86165	1.08160
3.59882	1.36023
5.46074	2.06397
2.24828	.84977

4.77606	1.80518
4.50277	1.70189
6.88791	2.60339

## 34 Discussion

The result of this study showed that the assessment of cardiorespiratory endurance ( $VO_2\text{max}$ ) among 56 selected athletes indicates a total of 31 athletes are low category, 3 athletes are high level; 16 is ideal category, 6 athletes are classified as a very low category. For the vertical jump test, the result showed that 6 athletes are excellent category, 26 athletes are medium level, 10 is classified as good level, and 13 athletes are low level. In general, among male and female, the  $VO_2\text{max}$  varies between 27.75 and 59.5 ml/kg/min. It means that the athletes who perform very well in endurance activities seem to have the best  $VO_2\text{max}$ .

A similar study found that there is a significant correlation between  $VO_2\text{max}$  and physical performance [16]. Thus, some authors stated that the four highest-ranked teams in the 1<sup>st</sup> Hungarian football division also ranked in the same order at the level of  $VO_2\text{max}$  [17]. This hypothesis is also supported by the results of other authors who demonstrates a significant difference in  $VO_2\text{max}$  between the leading team and those ranked lower in the Norwegian elite division championship. Since football is considered an endurance sport, the  $VO_2\text{max}$  seems to be the priority among specialists in physical preparation for football. However, it should be noted that other factors must be taken into account [18].

To improve the athlete physical performance, whatever the type of sport. One must think, among other things, of the technical, tactical and psychological elements. In addition, one research explains that during a race event, the runner with the good  $VO_2\text{max}$  also has good performance [19]. It is therefore important to understand that the  $VO_2\text{max}$  is necessary as the most important element, in the context of events of "natural activity" such as running [20]. This study reaffirms the idea of the presence of several other determining factors during an activity as complex as football, rugby and other disciplines. It is in this same perspective that we will also try to analyze the second element of endurance and performance [21]. Cardiorespiratory, the lactate threshold (LT) and see to what level the increase in the lactate acid concentration in the footballer and rugby can play on his performance [22].

Plyometric involve excessive intensity eccentric contraction without delay after an effective concentric. The jump peak is typically recorded as a distance score. It can be affected by the perspective of knee bending, effective use of hands, co-ordination etc. Hence, to minimize these factors, the students have been given three attempts to perform the check, and the average of the scores had been recorded for evaluation motive contraction. A vertical bounce in basketball additionally includes fast & repeated muscle contraction & stretching [23].

Vertical bounce measurements are used exceptionally in athletics to measure performance. The most frequent sports is measured by the subject and music events, basketball, football, volleyball, rugby, Beach volleyball, athletic, martial art, roller skating, cycling, skier etc. the vertical jump aims to assess lower limbs muscles power [24]. Many studies tested the outcomes of multidimensional training on vertical bounce height and  $VO_2\text{max}$  that are the important element on the athlete performance [25]. It was once additionally aimed at deciding the effect of the pre-training status, gender and pubertal age on the difference in vertical jump post plyometric education.

Jumping capacity has been regarded as critical for successful overall performance in many sports. It depends on the sport, the significance of jumping potential can be affected by way of the course of the jump. Consider the tactical nature of jumping activities in team sports activities like basketball, football (soccer) and volleyball, a vertical jump top is regularly regarded to be fundamental performance outcome. For example, a higher soar height completed throughout a jump in basketball produces greater beneficial circumstance for photographs and rebounds. In volleyball, the achievement of an increased jump peak affords a clear gain in the assault and block actions. Also, numerous researches have shown an advantageous association between jumping potential and different motor abilities. The countermovement leap (CMJ) and drop bounce (DJ) is dependable and valid for the evaluation of leaping overall performance. At this point, it is worth noting that both duties represent distinctive muscle motion patterns The CMJ is labelled as gradual SSC movements and DJ as speedy due to shorter contraction time and a smaller vary of action when in contrast to CMJ.

Plyometric workout routines extensively believed in contributing positive neuromuscular diversifications to excessive eccentric forces and corresponding enhancements in vertical leaping capability. This education strategy is superb due to make bigger fibre force and contraction speed. The critical mechanism explaining the consequences of plyometric workouts is related to a specific muscle performance in the stretch-shortening cycle (SSC). This sequence of concentric (shortening) contraction preceded through the severe eccentric motion (stretch) extended pressure and speed in contrast to concentric action by myself. The impact of the SSC is due to the storage and utilization of the elastic energy, the stretch reflex and tendon reflex. A standard plyometric education consists of jumps in place, standing jumps, a couple of hops and jumps, bounds and drops jumps. Jumps in place contain leaping and touchdown in the identical spot. Standing jumps like vertical jumps over boundaries are carried out with the maximal effort. Multiple hops and jumps involve repeated movements. Bounds are carried out in a horizontal direction. Drop jumps consist of jumping off a box, a two-legged landing, and bounce upward or to some other box at once after landing.



## Conclusion

In conclusion, the physical performance of an athlete is crucial to take part in sporting events such as championships. Thus, the athlete needs to have good body health qualities, including physical health like strength, muscle speed, muscle power, cardiovascular endurance measured by  $\dot{V}O_2\text{max}$ , agility, the potential to withstand fatigue. In conjunction with the findings above, we identified that there are some sport disciplines have a low effect on body performance. Thus, the sports athlete needs a good physical performance such as cardiorespiratory endurance ( $\dot{V}O_2\text{max}$ ) and muscle power

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