Contribution of Power Floating Muscle and Power Floating Arm Muscle on Smash Ability

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Abstract— The purpose of this study was to study the contribution of limb muscle explosions and muscle explosive power to smash abilities of PB Semerup Junior badminton club athletes in Kerinci Regency, Jambi Province. This type of research is correlational. The population in this study were all PB Semerup Junior badminton club athletes in Kerinci Regency, Jambi Province, which supported 24 athletes. The sampling technique uses purposive sampling. Thus the sample in this study tested 18 male athletes. Data collection techniques are: 1) Explosion of limb muscles are tested with vertical jumps, 2) Explosive strength of the arm muscles is tested with two hand medicine balls, 3) Power of the smash is tested using a badminton court with money boxes that have been printed on the field. Data were analyzed correctly at the field. The results of data analysis obtained are as follows: 1) Explosive strength of leg muscles contributes significantly to the smash ability of PB Semerup Junior badminton club athletes in Kerinci Regency Jambi Province by 37.82%, 2) Explosive muscle strength of the arm contributes significantly to smash ability PB Semerup Junior badminton club athletes in Kerinci Regency Jambi Province amounted to 35.64%, 3) Explosive strength of leg muscles and explosive strength of leg muscles together contributed significantly to smash ability of PB Semerup Junior badminton club athletes in Kerinci Regency, Jambi Province, 41, 34%.

Keywords—Leg muscle explosive power, arm explosive muscle power, smash ability

I. INTRODUCTION

Badminton is one of the achievement sports that are fostered a lot, badminton is a popular sport among children, adolescents, and even parents are very fond of this sport. Lately, many badminton schools or clubs have been established in every district, region and city with the aim of finding new seeds of talented players to show achievements at both the national and international levels.

This badminton game is individualized that can be done individually by way of one on one or two people against two people. This game required tools in the form of a racket as a weapon to turn off the opponent's game or end the game to get numbers. Moreover, accompanied by a jump, the smash will be harder and faster because the body's swing when doing a bigger smash is issued so that the fall of the shuttlecock is harder and faster. According [3] "Smash is a key hit to turn off the shuttlecock on the side of the opponent, this blow is a finishing blow that shuttlecock is very difficult to return".

Based on the results of interviews with Club PB badminton coach Semerup Junior often took part in badminton training, but his achievements were not maximal, including in 2015 following the Regent Cup match between students, out of 7 student representatives no one could win, in 2015 following a level competition subdistrict of 10 students, only 2 people who won, in 2016 took part in the Anniversary match of Kerinci Regency, out of 9 students only one person won, in 2017 took part in a badminton match between junior high school students in Kerinci Regency, out of 10 only one student won the championship. It is thought that many factors influence the performance of PB Semerup Junior Club Badminton athletes in Kerinci
dominant physical condition where the movements in the smash are explosive power blocks, namely the explosive power of the leg muscles

3. Arm muscle explosive power

According [2] explosive power is "the ability of a muscle or a group of muscles to overcome load resistance at high speed in an intact motion". Based on some of the opinions and explanations above, it can be concluded that the explosive power of the arm muscles is the ability of the arm muscles to direct force quickly in a short time to provide the best momentum for the object in a fully explosive movement to achieve the desired goal. The explosive power of the arm muscle in this study is the ability of the muscles to exert maximum force to make a smash, so the punch is hard and deadly.

II. RESEARCH METHODOLOGY

This type of research is correlational. The population in this study were all athletes of the PB Semurup Junior Badminton Club in Kerinci Regency, Jambi Province, totaling 24 athletes. The sampling technique uses purposive sampling. Thus the sample in this study amounted to 18 male athletes. Data collection techniques are: 1) Leg muscle explosive power was tested with a vertical jump, 2) Arm muscle explosive power was tested with two hand medicine ball put, 3) The ability to smash was tested using a badminton court with boxes ¬ values that have been printed in the field. Data were analyzed with product moment correlation and multiple correlation with a significant level α = 0.05.

III. RESULTS

1. Leg muscle explosion power

From 18 athletes, 1 person (5.56%) athletes have arm muscle explosive power with very good classification, 4 people (22.22%) athletes who have good leg muscle explosive power, 8 people (44.44%) athletes have leg muscle explosive power with a moderate classification, and 4 people (22.22%) athletes have leg muscle explosive power with less classification. For more detailed histogram distribution frequency data on the explosive power of the athlete's leg muscles can be seen in Figure 1.

![Histogram of Leg Muscle Power](image-url)
2. Arm Muscle Power Explosion

Of the 18 athletes, none of the athletes had arm muscle explosive power with very good and good classification, 4 people (22.22%) athletes had arm muscle explosive power with moderate classification, 11 people (61.11%) athletes had power explosive arm muscle with less classification and 3 people (16.67%) athletes who have arm muscle explosive power with very little classification. For more details can be seen in Figure 2.

![Figure 2. Histogram of Arm Muscle Explosion](image)

3. Smash ability

From 18 athletes, 1 person (5.56%) athletes who have a smash ability with a very good classification, 4 people (22.22%) athletes who have a smash ability with a good classification, 7 people (38.89%) athletes have a smash ability with moderate classification, 6 people (33.33%) athletes had the ability to smash with less classification and none of the athletes had the ability to smash with very little classification. For more details on the frequency distribution histogram of the athlete's smash ability can be seen in Figure 3.

![Figure 3. Data Histogram of Smash Ability](image)

IV. DISCUSSION

1. There is a significant relationship between leg muscle explosiveness and the ability to smash the badminton club athletes PB Semurup Junior, Kerinci Regency, Jambi Province.

Based on the results of the correlation analysis between the leg muscle explosive power to the smash ability, it was obtained a count of 0.615 > rtable 0.468. To test the significant correlation coefficient between the leg muscle explosive power and the smash ability, a t test was performed. Based on the results of the t test obtained t count = 3.110 > t table 1.744 with. Thus it can be concluded that there is a significant (significant) relationship between leg muscle explosive power to the smash ability of PB Semurup Junior Badminton club athletes in Kerinci Regency, Jambi Province, and leg muscle explosive power contributing 37.82% to the smash ability.

Based on the results of the above study, it is clear that the leg muscle explosive power is related and contributes considerably to the smash ability of PB Semurup Junior badminton club athletes in Kerinci Regency, Jambi Province. Therefore, it is necessary to pay attention to the badminton club coach PB Semurup Junior, Kerinci Regency, Jambi Province to be able to increase the athlete's leg muscle explosive power, including providing leg muscle explosive power training with or without weights.

2. There is a contribution of arm muscle explosive power to the smash ability of PB Semurup Junior badminton club athletes in Kerinci Regency, Jambi Province.

Based on the results of the correlation analysis between arm muscle explosive power to the ability to smash rcounts obtained 0.597 > rtable 0.468 and t arithmetic = 2.987 > t table 1.746 with and contributed to the smash ability of = 35.64%. This means that the contribution of arm muscle explosive power to the smash ability of PB Semurup Junior Badminton Club athletes in Kerinci Regency, Jambi Province is 35.64%. This means that the more explosive power of one's arm muscles, the better the smash ability.

According to Watson in [6] stated the explosive power is; "concerning the strength and speed of muscle contraction that is dynamic and explosive and involves the expenditure of maximum muscle strength in the shortest possible time". According to Bompa in [1] defines, "Explosive power as a product of two abilities, namely strength (strength) and speed (speed) to perform maximum force in a fast time".

The explosive power of the arm muscles is one of the basic components of physical condition which is very important in badminton, especially when doing smashes, both short and far smashes. If a player has no power good arm muscle burst when doing a smash, of course, the shuttlecock that is hit isn't strong and is easy for the opponent to return. Smash in badminton is a sharp downward punch at a hard speed. Smash referred to in this study is smash done with all his strength so that the opponent cannot be returned.

From the description above, it is clear that for someone to be able to do a good smash then the physical condition element of arm muscle explosive power is very much needed. Because the ability of physical conditions, arm muscle explosive power is one aspect that will greatly affect the ability to smash, meaning when doing a smash that is supported by physical conditions. One of them is the explosive power of arm muscles.

Based on the results of the above study, it is clear that the arm muscle explosive power contributes quite significantly to the smash ability of PB Semurup Junior Badminton club athletes in Kerinci Regency, Jambi Province. This means that the better the arm muscle explosive power, the better the player's smash ability. Therefore, it is important to pay
attention to the badminton club coach PB Semurup Junior, Kerinci Regency, Jambi Province to be able to increase the explosive power of the athlete's arm muscles.

In this way, to get good arm muscle explosive power, training is needed that can increase arm muscle explosive power, such as throwing and catching balls with medicine balls individually and in pairs,

3. There is a contribution of leg muscle explosive power and arm muscle explosive power together to the smash ability of badminton club athletes PB Semurup Junior Kerinci Regency of Jambi Province

Based on the results of the calculation of multiple correlations obtained $r_{count} = 0.643 > r_{table} 0.468$ and $F_{count} = 5.29 > F_{table} 3.68$. Thus it can be concluded that there is a significant (significant) relationship between leg muscle explosive power and arm muscle explosive power together with the smash ability of badminton club athletes PB Semurup Junior Kerinci Regency and contribute to the smash ability of = 41.34%.

According [4] "Smash is a quick blow, directed down firmly and sharply to return the short ball that has been hit up". According [2] "Smash is a key blow to turn off the opponent's game".

Based on the above quote, it is clear that smash is a major blow to victory. To get a good smash ability certainly requires good physical condition, such as leg muscle explosive power and arm muscle explosive power. Athletes who have good leg muscle explosive power can certainly make higher jumps, so that they can direct the shuttlecock to the intended target area and the shuttlecock that is hit is unrelated on the net. The explosive power of the arm muscles has a function so that a strong and hard punch is created so that the ball cannot be returned if the opponent's party is well and can create points.

Based on the results of the study above, it is clear that the leg muscle explosive power and the inert muscle explosive power contribute significantly to the smash ability of PB Semurup badminton club athletes in Kerinci Regency, Jambi Province. Therefore, the two factors mentioned above need to be trained and need to be considered, both from the coach and from the athlete itself. Thus efforts that can be made to improve the ability to smash need to be increased training in leg muscle explosive power and arm muscle explosive power in a programmed and continuous manner.

V. CONCLUSION

Based on the research results described in the previous chapter the conclusions can be concluded as follows:

1. Leg muscle explosive power contributed significantly to the smash ability of PB Semerup Junior badminton club athletes in Kerinci Regency, Jambi Province by 37.82%.
2. Arm muscle explosive power contributed significantly to the smash ability of PB Semerup Junior badminton club athletes in Kerinci Regency, Jambi Province by 35.64%.
3. Leg muscle explosive power and arm muscle explosive power together contributed significantly to the smash ability of PB Semerup Junior badminton club athletes in Kerinci Regency, Jambi Province by 41.34%.

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