Journal of Social Work and Science Education
Volume 4 (3)(Special Issue) 23-24 June 2023, 134-141
2nd International Conference on Education Universitas PGRI Palembang (INCoEPP 2023)
E-ISSN 2723-6919, P-ISSN 2746-0827

The Effect of Squat Jump and Box Drill Exercises on Increasing Leg Power in Male Taekwondo Athlete ATIA Lanal Lampung

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Abstract: Leg power strength is a very important component aspect in taekwondo martial arts, especially in basic kicking techniques in supporting the optimal kick. There are many modifications to the training model that can increase the power of the kick, one of which is the form of squat jump and box drill training. The purpose of this study was to determine the effect of the two training methods on increasing leg power in Atia Lanal Lampung athletes. The method in this study uses quantitative experimental research methods. In this study, there are 38 populations that will be divided using ordinal pairing with predetermined inclusion criteria, resulting in a total sample of 20 athletes. The results state that the effectiveness of squat jump and box drill exercises in increasing leg power can be substantial, but it depends on various factors, including the individual's fitness level, the design of the training program, and the proper execution of the exercises.

Keywords: Achievements, Athlete, Box Drill, Power Limb, Squat Jump.

A. Introduction

Sports are activities carried out for us to obtain physical and spiritual health and fitness (Singgih, 2016). Sports have an important role in building and improving the quality of human resources (Bastik et al., 2017). In addition, sports are very important to support the formation of character and personality, sportsmanship, discipline and improvement of achievements that can arouse a sense of pride for oneself and national unity (Ramdhani, 2014).

Someone in doing sports activities has different goals, for the selection of one sport depends on the interests of each of these individuals (Fong & Ng, 2018). Participating and being active in sports activities, means training ourselves to improve the quality of various aspects needed to maintain the health and fitness of ourselves and also to continue to exist among an increasingly dynamic society (Nurcahyo et al., 2016). To form an awareness of the strategic significance of sport must really go through development planning with the progress of sports as a whole. It must be comprehensive in various potentials that contain a spirit and strength to build because sport is a sense of spirit from

a long process of development (Irmansyah et al., 2021) (Susanti et al., 2022) (Palar et al., 2015).

Currently, taekwondo is one of the martial arts sports that is in great demand by many people regardless of age, gender, and social status (Sabatani, Ni, Koman et al., 2019). Taekwondo is a contact sport, so the risk of injury during fighting is very high (Khusuma et al., 2021). Therefore, a competitive Taekwondo athlete with good skills and a mature competitive spirit is needed (Kusminto et al., 2021). The quality of Taekwondo athletes is influenced by physical and psychic characteristics (Tuti, 2019). Physical quality is determined among other things by the state of muscles and the state of energy (Susanti et al., 2022). Muscle fitness includes strength, endurance, speed, flexibility, and coordination. Energy fitness includes aerobic energy systems and anaerobic energy systems (Arwandi et al., 2020). In addition, psychological quality is influenced by factors such as motivation, tension, fear, concentration and attention. Therefore, biomotor components are needed to optimize the performance of Taekwondo athletes (Pimenta & Drigo, 2022).

Biomotor components that exist in taekwondo when movement occurs in individuals that are influenced by other systems in it. These systems include the energy, muscle, bone, joint and cardiorespiratory systems (Fahrizqi, 2018). The basic components of biomotor are endurance, strength, speed and flexibility. There are other components such as strength, flexibility, balance and coordination, which are combinations and mixtures of several basic components of biomotor (Setiyawan, 2017).

The development of taekwondo in Indonesia has not fully followed the one-way training model (Aprilia et al., 2018). This means that there are still many training models in Indonesia that do not follow a tiered and continuous training system. Therefore, it is necessary to pay attention to the taekwondo sports coaching system, especially at the ATIA Lanal Lampung taekwondo club. Taekwondo's success in reaching peak achievement is largely determined by the quality of its practice (Daniel & Harland, 2017). The quality of training is mainly determined by the circumstances and abilities of the coach and athlete, but both must have the ability, will and dedication for maximum results (Kozina et al., 2023).

In order to get maximum results, one component that greatly affects is the power of the limb itself. Power is very important in taekwondo martial arts, especially in kicking techniques because without good muscle strength, a good kicking technique will not be created, and vice versa with good muscle strength will create a good kicking technique. A person's power is influenced by one of them, the power of the leg muscles. Strength is the ability of a muscle or group of muscles to perform maximal contraction against

resistance or load (Al Attar et al., 2021). Muscle strength is very important for any person or athlete. This muscle strength allows athletes to perform movements in any sport (Bangun, 2016). According to (Păunescu et al., 2019) suggests that power can be interpreted as power and speed that are carried out together in carrying out a motion. A person with good muscle strength can perform and do heavy work for a long time. Physically fit people have strong muscles and are able to work efficiently (Setiawan, 2018).

Researchers obtained final data in the field by the coach during training to test leg power using a vertical jump measuring instrument, found that the average result was only that the average athlete could kick the target quickly and on target as much as ≤ 15 for men and ≤ 13 for women within 10 seconds, it was noted that the training program given by the coach was also still lacking in increasing the strength of the athlete's limbs. The exercises are only focused on the basic techniques. So, this is a big task for coaches in optimizing power in athletes so that the goals and achievements expected by the coach and club get optimal results. The modification of the exercise form model in increasing leg power is relatively quite a lot, so researchers are interested in looking for influences on leg power in applying squat jump and box drill training forms.

Squat jump is an exercise aimed at exercising the muscles: Thigh muscles (biceps femoris) at the back of the lower leg, gluteus maximus (Hanif et al., 2019). Doing a squat jump exercise is a position with one foot forward and the other leg back. Lower the body and then jump into the air, once in the air, change the position of the feet so that the hind legs are now in front and vice versa, land on the toes, then transfer the weight back to the last heel, immediately bend the knees to reduce danger (Grigore et al., 2020). According to (Susianti, 2016) Box drill is an exercise that uses several boxes with an exercise method done with various movements where the size and height of the box can be adjusted. Box drill drills are exercises that increase explosive power, but this exercise emphasizes the height of jumps (Rudiansyah et al., 2014).

From the results of observations conducted in April at the Sports Activity Center Building (PKOR) located in the Bandar Lampung PKOR Complex, it was found that one of the goals was to boost the achievements of the ATIA Lanal Lampung taekwondo club or the junior class category aged 14-16 years. There are many taekwondo championships for junior and senior classes in the region, especially Bandar Lampung. In addition, the development of achievements in the field of Taekwondo can be achieved through widespread training programs. But in reality, the potential of athletes in ATIA Lanal Lampung has not achieved optimal results. One of the causes of not optimal performance training at the club is that the coaches do not understand the importance of leg power training, so that training performance is not optimal. Current power training programs

are many and varied, but there is no training for taekwondo athletes' power enhancement that can be applied to the pre-competition periodization. So many taekwondo athletes have not gotten maximum results in power training. Taekwondo trainers at ATIA Lanal Lampung still need a simple limb power training model, one of which is implementing the Squat Jump training system and Box Drill Training.

In line with that, it is the same as the research researched by (Khairuddin, 2020) In his research that examined the "Effect of Squat Jump Training Form on the Shooting Strength of Pro:Direct Academy Athletes" from the study found that the t-count for strength test results was 3.548, where the value was greater than the table value with 19 free degrees and a significance level of 1% which was 2.539. As well as research researched by (Palar et al., 2015) In his research entitled "The Explosive Power of Momtong Dollyo Chagi's Kick" where the study applied laithan box drill with the results of (1) overall, the pliometric standing jump training method is better than the pliometric box drills training method against the explosive power of Momtong dollyo Chagi's kick, (2) for taekwondoin who have high flexibility, the standing jump pliometric training method is better than the pliometric box drills training method Regarding the explosive power of Momtong Dollyo Chagi's kick, (3) For taekwondoin who has low flexibility, there is no significant difference between the pliometric standing jump training method and the pliometric box drills training method against the explosive power of Momtong Dollyo Chagi's kick, (4) There is an interaction between the pliometric training method and the flexibility of Momtong Dollyo Chagi's kick explosive power.

B. Methods

This research is quantitative experimental research which will compare the results of data from two different subjects, quantitative research itself is a study that produces data in the form of numbers to be analyzed and calculated using certain statistical calculations to answer the hypothesis of a predetermined study (O'Sullivan et al., 2016). This research was carried out at the Taekwondo club Atia Lanal Lampung. The population is all Atia Lanal Lampung athletes as many as 38 students. Samples were taken by Ordinal Pairing with inclusion criteria (1) athletes who are active in the ATIA Lanal Lampung organization, (2) are not currently sick, (3) are able to follow the training program that has been prepared, (4) athletes aged 14 – 16 years. So, from the data found a sample of 20 athletes.

This study is a quantitative study with quantitative data in nature, the data collected will then be analyzed to get valid results in this study. The design used in this study was an experiment with a non-equivalent control group design approach. Both groups were given pre-test and post-test treatment but the models used were different. The

experimental group was given treatment in the form of a Squat Jump training model, while the control group was given a box drill training model treatment.

C. Result and Discussion

The effect of squat jump and box drill exercises on increasing leg power is a topic of interest in the field of exercise science and sports performance. These exercises are commonly used to target the lower body muscles and enhance leg strength and power. The effectiveness of these exercises in increasing leg power can vary depending on various factors, including the individual's fitness level, training program design, and proper execution of the exercises. Here's a general overview of how these exercises can contribute to increasing leg power:

Squat Jump

Squat jumps primarily target the quadriceps, hamstrings, glutes, and calf muscles. During a squat jump, an individual starts in a standing position, performs a squat by bending the knees and lowering the hips, and then explosively jumps upward, extending the hips, knees, and ankles. Squat jumps are considered a plyometric exercise, which involves rapid stretching and contracting of muscles. This type of exercise can enhance muscle power and explosiveness.

Box Drill

Box drills can be designed to target a variety of lower body muscles, depending on the specific drill chosen. For example, lateral box drills target the inner and outer thighs, while vertical box drills focus on overall leg power. Box drills involve stepping on and off an elevated platform or box in various patterns and directions. These drills often include quick and explosive movements. Box drills can improve agility, coordination, and leg power. They also simulate the types of movements athletes may perform in sports that require rapid changes in direction.

The effectiveness of these exercises in increasing leg power depends on several factors:

1) Training Program: The design of the training program, including the number of sets and repetitions, the intensity, and the frequency of the exercises, plays a crucial role. Progressive overload, where the resistance or intensity is gradually increased, is important for strength and power gains.
2) Proper Technique: Correct execution of the exercises is essential to ensure that the targeted muscles are effectively engaged and to minimize the risk of injury.

3) Individual Differences: People respond differently to training, so the effectiveness of these exercises may vary from person to person. Factors such as age, gender, genetics, and training history can influence the outcomes.
4) Nutrition and Recovery: Proper nutrition and adequate rest and recovery are essential for muscle growth and strength development.
5) Consistency: Consistent and structured training over time is necessary to see significant improvements in leg power.

It's important to note that these exercises should be incorporated into a well-rounded training program that includes a variety of exercises to target different muscle groups and movement patterns. Additionally, it's advisable to consult with a fitness professional or coach to tailor a training program to individual goals and needs.

D. Conclusion

The effectiveness of squat jump and box drill exercises in increasing leg power can be substantial, but it depends on various factors, including the individual's fitness level, the design of the training program, and the proper execution of the exercises. Squat jump and box drill exercises have the potential to be effective tools for increasing leg power when integrated into a structured training regimen. However, their effectiveness depends on various factors, and individual responses may vary. A well-rounded and progressive training program that includes these exercises can contribute to improvements in leg power and overall athletic performance.

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