

Kicking ability for the Eolgol Yoep Chagi Taekwondo Poomsae in terms of quality of physical condition, self-confidence, and comparison of leg muscle explosive power and core stability

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Abstract:

The purpose of this study was to determine the kicking ability for the eolgol yoep chagi taekwondo particularly in Poomsae (form competitions) in terms of quality of physical condition, self-confidence, and comparison of leg muscle explosive power and core stability of taekwondo athletes at the State University of Jakarta. In this study, there were 30 taekwondo athletes, specifically 15 males, and 15 females. The method involved survey research using a comparative design. Data analysis techniques used in this study included descriptive analysis and inferential analysis; descriptive analysis is used to describe the mean and standard deviation of the results of this study while inferential analysis using a t-test (paired sample test) with a significant degree of $\alpha=0.05$ with overall data analysis performed using software SPSS version 20.0. The results of this study describe the kicking ability for the eolgol yoep chagi taekwondo poomsae in terms of the quality of physical condition and self-confidence. In both categories, this was shown by the average value of each variable, and there was a difference between the explosiveness of the limb muscles and the main balance in taekwondo athletes from The State University of Jakarta (males and females). This study only involved some qualities of physical condition and confidence, and we compare the explosiveness of the limb muscles and the main balance in taekwondo athletes in terms of Poomsae, but further research will be conducted involving all components of the quality of the physical, psychological condition, and social to improve the performance of taekwondo athletes, especially in terms of Poomsae.

Key Words: quality of physical condition, self-confidence, power of leg muscles, core stability

Introduction

The physical and psychological condition of taekwondo athletes is one of the main factors for performance. According to Nugroho et al. (2021) the quality of the physical condition is the foundation for developing the techniques, tactics, strategies, and mentality of an athlete. Another study said that (Jariono et al., 2020) the quality of good physical condition is determined by continuous exercise factors and supported by the qualifications of professional coaches in developing athlete performance in stages without causing negative effects. This is in line with what was presented by Bridge et al. (2014), who suggested that the physical and physiological profile of athletes is a supporting factor in determining the quality of athletic performance in a match. Shin et al. (2016) suggested that if an athlete has a good physical condition quality, then they could perform better. Fachrezzy et al. (2021) said that the quality of the physical condition is the dominant basic factor in determining the maximum physical condition so that an athlete can obtain a performance that does not easily result in tiredness when receiving the next training load. Singh et al. (2017) proposed that good quality is required to provide programmatic and tiered training loads so that an athlete can perform better.

Thus, an athlete who wants to perform well needs to display good physical condition and confidence. The quality components of physical condition consist of endurance, strength, balance, agility, and speed. According to Chung & Johnson (2019), an athlete who wants good performance, needs to be exposed to competitions with other athletes both in official taekwondo matches and new competitions with game and competition rules. Hyuk (2013) suggested that the quality of a qualified athlete's physical condition can show the aesthetic value in the match. According to Campos et al. (2012) to improve the quality of the physical condition, the need for energy must be considered so that an athlete does not experience significant fatigue.

Confidence is a psychological state during the performance of athletes as indicated by ability, effort, optimism, independence, stamina, ability to adjust, manage fatigue, and have mental and physical abilities (Aristiani, 2016); (Achmad, 2018; Arsyad et al., 2018; Hernado et al., 2017; Nur & Hidayah, 2017; Plisk, 2003; Taber et al., 2016; Vanhatalo et al., 2011), and power is one of the physical components that allow one's ability to cope with loads at high contraction speeds as quickly as possible effectively and efficiently (Bompa & Buzzichelli, 2019). Then, core stability is a person's ability to control movement and position at the centre of the body by maintaining balance both in the pelvic and trunk position (Aytar et al., 2012); (Aytar et al., 2012; Dan et al., 2016; Firdauz & Setijono, Hari., 2017; Primary, 2019). Taekwondo is a martial art that originated in Korea that consists of hitting, kicking and hindrance (Shin et al., 2016). (Arabaci et al., 2010) with agility, reaction time, and speed as the physical components that determine the quality of the physical condition in taekwondo sports. Pieter (2009) suggested that taekwondo is more dominant with kicks.

Taekwondo is a martial art style that originated in Korea over 2000 years ago. Amongst martial arts is a style known as Taekwondo, recognized for its emphasis on kicking technique sand barehand and feet freestyle fighting (Ishac & Eager, 2021). Taekwondo demonstrations are impressive performances of athleticism and artistry and consist of basic Taekwondo skills, such as traditional forms and patterns (called "Poomsae"), choreographed self-defense sequences, and board breaking (Lee et al., 2020). Taekwondo fighters require sufficient postural stability to better maintain tactical superiority over an opponent (Rosker & Vodigar, 2020). Taekwondo (TKD) training is generally based on movement, displacement, jumping, and kicks an punches in bags, pad and racket (Hammami et al., 2021)

Basically, taekwondo requires physical and psychological conditioning. taekwondo is now more advanced and popular, and three things can be learned in taekwondo, namely Taekwondo (poomsae) martial arts, fights in taekwondo martial arts (kyorugi), and techniques for breaking hard objects with kicks and punches (kyukpa). Currently, the most frequent taekwondo championships are held in various regions in both districts, and provincial and national championships include kyorugi (fight) categories and poomsae (form), but in some taekwondo championship events, they have started to hold ky up (solving) category matches.

To display the quality of an athlete's physical and psychological conditioning, there is a need for interaction between coaches and athletes and adequate infrastructure. Ahmadi et al. (2021) suggested that the interaction between individuals is one of the important factors in establishing lead relationships between individuals and group. Looking at the problems raised by Ahmadi, researchers have assumed that in sports, especially in sports that require good quality physical and psychological conditioning, a person or group needs reciprocal interaction during the exercise process.

Based on the phenomenon of these facts, we studied scientific data to analyse the kicking ability in terms of the colgol yoep chagi taekwondo Poomsae number regarding quality of physical conditioning, self-confidence, and comparison of leg muscle explosive power and core stability during taekwondo.

Materials & methods

The methods used in this study and a comparative design were used to compare the variables of limb muscle explosiveness and primary stability. Data collection techniques via tests and measurements and questionnaires were used to measure the athletes' confidence. We measured the explosiveness of the limbs using a leg dynamometer, and for balance, we used a simple tool that involved athletes standing on 1 foot and maintaining balance for 1 min. For the confidence questionnaire, the athletes provided questionnaire responses via negative and positive statements for indicators of self-confidence and a positive attitude, and we utilized the advantages and sub-indicators of confidence of ability and effort, optimism, independence, determination, ability to adjust, having and utilizing attractiveness, and having the mental and physical capacity.

The sample for this study included 30 poomsae taekwondo (15 males and 15 females). The method used in this study was a survey with a comparative design. Data analysis techniques in this study included descriptive analysis and inferential analysis, and descriptive analysis was used to describe the confidence and quality of physical conditioning, whereas inferential analysis involved t-test to compare limb muscle explosiveness and primary stability at a significance level of $\alpha=0.05$. All data analysis was performed using SPSS 20.0.

Results

1. Descriptive analysis

The purpose of descriptive analysis of research data is to illustrate the discrimination of power differences, core stability, and confidence of taekwondo athletes from average grades, standard deviations, minimum values, maximum values, range of values, and the total number of acquisitions from measurement test results of each variable. A recap of the descriptive analysis of our data from each variable is shown in the following histogram.

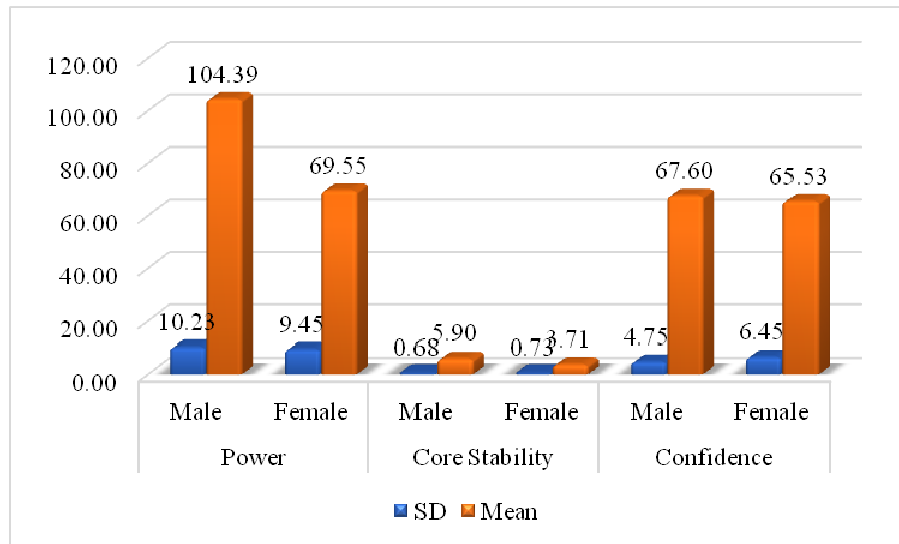


Fig. 1. Histogram of standard deviations and means for power, core stability and confidence in our sample

As shown in Figure 1 of the descriptive analysis for power, core stability, and confidence of the taekwondo athletes from Universitas Negeri Jakarta (15 men and 15 women), there were differences in each variable. This is evidenced by the average power, core stability and confidence values of 34.84, 2.19 and 2.07, respectively. The quality of physical and psychological conditioning of taekwondo athletes correlates with the gender and the needs of the athletes. Then, the normality test was conducted. The results of the normality test are shown by the following prerequisite tests.

2. Prerequisite test

Normality tests were used as a prerequisite for hypothesis testing. The normality test using the *Kolmogorov-Smirnov Z* (KS-Z) test at a significance level of $\alpha=0.05$ are shown in the following histogram.

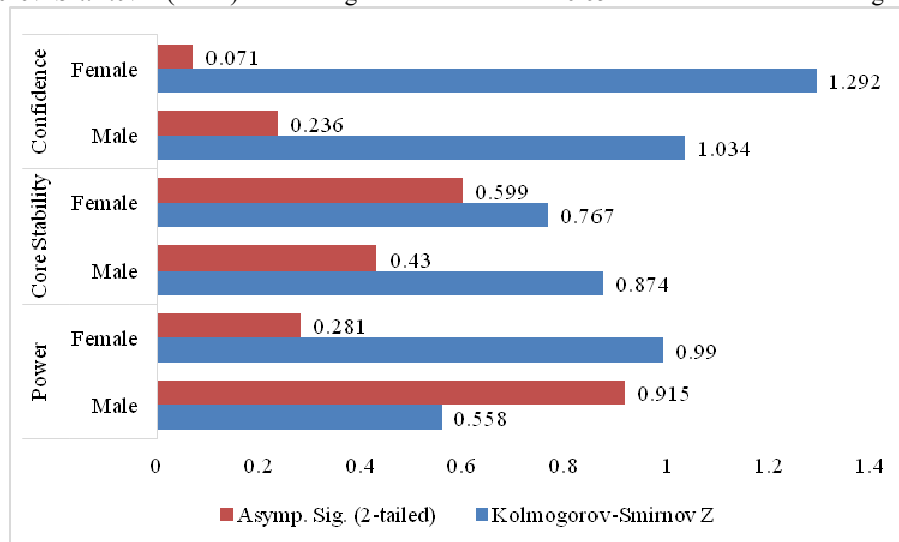


Fig. 2. Histogram of normality tests of power, core stability and confidence

Based on the results of the normality test, the test values of power normality, core stability and confidence for the *Kolmogorov-Smirnov Z* (KS-Z) test for the entire data group were all greater than the value of $\alpha = 0.05$. Thus, the sample in this study was a normally distributed population. After the normality test, further hypothetical testing was conducted.

3. Hypothesis test

The hypothesis test in this study was performed to analyse the differences in the ability to kick eoigol yeop chagi for taekwondo in poomsae event based on the quality of physical conditioning, confidence, and comparison of limb muscle explosiveness and primary balance in taekwondo athletes from Jakarta State University, as shown in the following histogram.

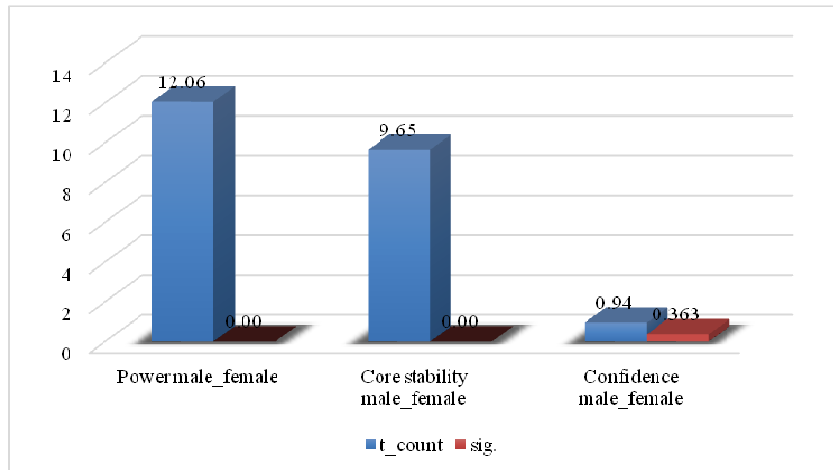


Fig. 3. Histogram of paired t-test for power, core stability and confidence

Based on analysis of the paired samples test (t-test) data for power, core stability and confidence shown in Figure 3 above, we found values of t_{count} of 12.05, 9.65 and 0.94, respectively, and a $t_{\text{table}} (29 (10);0.05)$ of 1.699. The uniqueness of this study was that there was no significant difference between male and female athletes because the t_{count} was smaller when compared to the t_{table} of 1.699. Based on these results, the paired samples tests (t-test) between power data and significant core stability (H_0 was rejected), confirming H_1 , whereas for athlete confidence, there was no meaningful difference between male and female. Thus, there was a significant influence of power and core stability on the taekwondo athletes from Universitas Negeri Jakarta for Poomsae number. This means that the coefficient can be generalized or can be applied to the overall population of taekwondo athletes from The State University of Jakarta, where a sample of 30 people was used.

Discussion

The results of this study showed that the quality of physical conditioning, confidence and the comparison of limb explosiveness and balance were the main determinants in the performance of taekwondo athletes, especially in terms of Poomsae numbers of taekwondo athletes from Universitas Negeri Jakarta. This was supported by our descriptive analysis results and inferential analysis results. Interestingly, in terms of confidence between male and female taekwondo athletes, there was no significant difference, as evidenced by the results of the analysis of the data and our observations as well as that of the taekwondo coaches. The confidence of every athlete both during training and during matches becomes the determining factor for athletes when achieving victory. Therefore, athlete confidence is one indicator of psychological factors that support athlete success. If the athlete has a good confidence and is supported by a good quality physical condition, then, they can win every match. Similarly, if the athlete does not have good confidence and is not supported by a good quality physical condition, then, they will not win every match. The results of this study are supported by a prior study (Matsushigue et al., 2009) the results of that study suggested that for Taekwondo, there are physiological responses according to match analysis. C. A. Bridge et al. (2013) described physical and physiological profiles of Taekwondo athletes as supporting factors for athlete achievement. Estevan et al. (2013) suggested that there is an effect of stance position on kick performance in taekwondo. Additionally, others (Altarriba-Bartes et al., 2014) have described the epidemiology of injuries in elite taekwondo athletes during two olympic periods in cross-sectional retrospective studies. Another study described (Muslima & Himam, 2018) the role of coaches in coaching athletes for achievements in professional taekwondo organizations. Another study described (Kurniawan & Gusrianty, 2019) a support system for taekwondo Poomsae athletic selection decisions using an analytic hierachy process method. Another study (Hyuk, 2013) described the aesthetic values of the taekwondo Poomsae game. Another study (Chung & Johnson, 2019) described taekwondo poomsae competitor perceptions of official and new competitions in poomsae, the field of play and competition rules. Another study (Aksoy, 2019) studied the effects of 10 weeks of whole body vibration training on the strength, flexibility and agility of taekwondo athletes. Finally (Fachrezzy et al., 2021) (Aksoy, 2019) other studies have analysed the physical fitness of poomsae taekwondo athletes in terms of agility, balance and endurance. Previous research suggests that martial arts practice may be associated with enhanced psychological and physical wellbeing. Studies have been conducted by several researchers that have analysed the kicking ability during eolgol yoep chagi taekwondo Poomsae as determined from the quality of physical conditioning, confidence and comparison of limb muscle explosiveness with primary balance. The results are consistent with the following study conducted by Kim et al. (2020) "Exploring the Motives of College Taekwondo Poomsae Athletes for Participating in the Poomsae Competitions", (Lin, 2020) "Effect of Taekwondo Poomsae Training on Weight Loss of Obese Children", and (Tayshete et al., 2020) "Comparison of Effect of Proprioceptive Training and Core Muscle Strengthening on the Balance Ability of Adolescent Taekwondo Athletes". Thus, the ability to kick eolgol yoep

chagi taekwondo in poomsae was reviewed from standpoint of quality of physical conditioning, confidence and comparison of limb muscle explosiveness with the main balance as solutions to be applied in exercise to particularly improve the quality of physical conditioning, confidence, and limb muscle explosiveness and balance more effectively and efficiently. We found no significant difference between male and female taekwondo athletes as evidenced by our analysis and observations as well as those of taekwondo trainers. The confidence of every athlete both during training and during games becomes the determining factor of athletes achieving victory. Therefore, athlete confidence is one indicator of psychological factors that support athletes' successes.

Conclusions

We analysed that the kicking ability during eolgol yoep chagi taekwondo poomsae in terms of quality of physical conditioning, self-confidence and comparison of leg muscle explosive power and core stability during taekwondo, but further research will be conducted involving all components of the quality of physical and psychological conditions to improve the performance of taekwondo athletes especially in terms of Poomsae numbers.

Conflicts of interest In this study, there were no conflicts of interest.

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