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The Effect of Fast and Medium Rhythm Squat Training on Leg Muscle Power in Wushu Sanda Karo Simalem Fighter Athletes in 2024

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Abstract
Kicks are one of the important techniques in wushu sanda sports, where leg muscle strength and power are one of the physical ability conditions in supporting kicks, but in fact the leg muscle power of wushu sanda karo simalem fighter athletes is still not good, which can be seen from the results of the vertical jump test that has been carried out, so that if leg muscle power is not increased it can hinder wushu sanda karo simalem fighter athletes in carrying out attacks, especially when kicking during a fight. The purpose of this study was to determine the effect of fast and medium rhythm squat training on leg muscle power in Wushu Sanda Karo Simalem Fighter Athletes in 2024. This study used an experimental method with a pre-test and post-test design. The sample in this study amounted to 22 athletes of the Sasana Wushu Sanda Karo Simalem Fighter 2024 with sampling using the total sampling technique. The data analysis technique used the t-test calculation, namely the paired t-test. Based on the results of the hypothesis test, the t-test value was obtained (2.59) and the t-table test value was 2.086, so it can be concluded that there is an influence of fast rhythm squad training which is more influential than medium rhythm squad on the leg muscle power of the Sasana Wushu Sanda Karo Simalem Fighter 2024 Athletes.

Keywords: *Fast & Medium Rhythm Squad, Leg Power, Wushu*

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INTRODUCTION

Sports in society are used as a platform to showcase performance in achieving achievements, but in its development, apart from being a platform for achievement, sports are also applied in educational, recreational, and physical fitness activities. This is also explained in Indonesian Law Number 3 of 2005 concerning the national sports system, where in chapter 2 article 4 it is explained that national sports aim to maintain and improve health, fitness, achievements, and human quality, instilling noble moral values and ethics, sportsmanship, discipline, strengthening and fostering national unity and integrity, strengthening national resilience, and elevating the dignity and honor of the nation. In relation to the above objectives, Article 27 of the 1945 Constitution also states that the development and advancement of

competitive sports shall be carried out by empowering sports associations, developing and fostering sports at the national and regional levels, and organizing competitions in a tiered and sustainable manner.

Sports as part of human life is a pursuit of progress that is reinforced in many ways. Sports are important for building character, discipline, excellence, competitive productivity, and a work ethic that is useful in individual sports activities to improve the quality of human resources to achieve desired achievements. The essence of sports is also physical activity, which means playing and competing with oneself or with others, or facing the elements of nature.

Based on the above quotation, it can be concluded that sports are expected to create a healthier society, both physically and mentally, and that sports are also expected to shape better personalities and characters in order to contribute to the development of sports in the country through good achievements. To achieve good and maximum performance, it is necessary to carry out sports coaching, starting with organizing sports clubs, followed by holding competitions in stages and continuously to be used as a benchmark for the success or failure of the sports coaching carried out. Sports coaching and development have become a shared responsibility, starting from the central to regional levels through existing parent organizations in order to achieve maximum performance.

Sports are muscular activities that require energy in athletic activities that demonstrate movement abilities (performance) and maximum abilities. Each sport requires a different level of physical condition. Physical condition is an integral whole of components that cannot be separated, including their maintenance. This means that in order to improve physical condition, all of these components must be developed, even though this may be done here and there according to the circumstances or status required for the athlete's performance.

The physical components of wushu martial arts, according to Solissa Jonas (2015), include endurance, speed, power, agility, coordination, and balance. Physical condition is an aspect that cannot be ignored in the development of competitive sports. This is because physical condition determines an athlete's ability to train, compete, or race.

With the training program in place, it is carried out continuously, measured, and evaluated so that the extent of improvement can be determined and its impact on the athlete's preparation for competition can be assessed. Therefore, athletes must train diligently so that their performance during competitions is optimal. It is impossible for athletes who want to participate in competitions outside their region to have no preparation at all. Therefore, athletes who want to achieve high performance must be disciplined and obey the rules set by the coach,

for the sake of the club or gym itself, as well as the region they represent. In Indonesia, Wushu has seen significant growth, as evidenced by the increasing public interest and the numerous championships held annually. Wushu, as a martial art, is consistently featured in competitions at both national and international levels.

METHOD

The purpose of this study is to determine and find out whether squat training has an effect on increasing leg muscle power in athletes at the Sasana Wushu Sanda Karo Simalem Fighter gym. Therefore, the research method used in this study is the experimental method, where a pre-test will be conducted before the training, followed by a post-test. test at the end. The variables in this study consist of two independent variables, namely fast and moderate squat training, and one dependent variable, namely leg muscle power.

RESULTS AND DISCUSSION

Result

At this stage, researchers presented data from pre-tests and post-tests of two training groups, namely the Fast Rhythm Squat group and the Medium Rhythm Squat group. This data aimed to describe the development of leg muscle strength in Wushu Sanda Karo Simale$m Fighte$r athletes before and after being given a training program during the research period. Measurements were taken using a vertical jump device to determine leg muscle strength quantitatively. The results will show whether there was an improvement in the athletes' performance after being given training treatments with different rhythms.

Statistical description of the pre-test and post-test results for the "Fast-Rhythm Squat" training group, which consisted of 11 Wushu Sanda athletes from the Karo Simalem Fighter gym. After undergoing the Moderate Rhythm Squat training program, there was an improvement in results, although not as significant as in the Fast Squat group. The total post-test score increased to 363, with an average of 33.00. The maximum score of the participants also increased to 40, while the minimum score became 24. The variance of the post-test results was 27.60, and the standard deviation increased slightly to 5.25, indicating that the participants' results were more diverse, but with a trend of improved performance. This improvement indicates positive development in the athletes' leg muscle power, although not as strong as in the Fast Squat group. The average increase from 29.64 to 33.00 indicates that the Moderate

Rhythm Squat exercise continues to contribute significantly to the improvement of leg muscle ability. For more details, see Table 4.1 below and the appendix on page 76.

Statistik	Fast-Paced Squad		Medium-Tempo Squad	
	Pre-Test	Post-Test	Pre-Test	Post-Test
N	11	11	11	11
Sum	326	431	326	363
Average	29,64	39,18	29,64	39,18
Maximum value	38	50	37	40
Minimum value	20	29	20	24
Variance	26,25	35,16	26,05	27,60
Standard deviation	5,12	5,93	5,10	5,25

Tabel 1. Description of Pre-Test and Post-Test Data for Fast- and Moderate-Tempo Squats and Vertical Jump Results Among Athletes at the Karo Simalem Fighter Wushu Sanda Gym in 2024

Based on the data shown in Table 4.1, it can be concluded that Fast Rhythm Squat training has a positive impact on increasing the leg muscle strength of athletes. The increase in the average, maximum, and minimum values in the post-test compared to the pre-test shows that this training is effective in improving the overall performance of athletes. In addition, the increase in variance and standard deviation shows that even though there are differences in the level of progress between individuals, the trend of performance improvement remains dominant. Thus, a fast-paced training program can be recommended as an effective method for developing leg muscle strength in Wushu Sanda athletes.

Based on the data description in Table 4.1 for the Moderate Rhythm Squat group, it can be concluded that there was an increase in the power of the athletes' leg muscles after undergoing the training program. The average pre-test score, which was initially 29.64, increased to 33.00 in the post-test, indicating the effectiveness of the training in improving the athletes' performance. The maximum and minimum values that increased in the post-test also reflected positive developments in most participants. The slight increase in variance and standard deviation indicated reasonable diversity in results in line with the overall improvement in performance.

Diagram Data Pre-Test Dan Post-Test Squat Irama Cepat Dan Sedang Hasil Vertical Jump Atlet Sasana Wushu Sanda Karo Simalem Fighter

All participants experienced an increase in scores after undergoing fast-paced squat training. Most participants who previously had scores in the range of 27–29 on the pre-test managed to improve their performance to the range of 32–34 on the post-test. This shows

significant development in the leg muscle strength of the athletes. This consistent increase in scores proves that the fast-paced squat training method is effective in increasing leg muscle power. Thus, it can be concluded that the application of fast-paced squat training has a positive effect and can be recommended for developing leg muscle strength in wushu sanda athletes. Meanwhile, the distribution of pre-test scores tended to be concentrated at scores of 27 and 34, with the highest number of participants at a score of 27, namely 3 people. After participating in moderate-rhythm squat training, the distribution of scores shifted to higher scores, namely 38 and 45, achieved by 2 and 3 participants, respectively. This shift indicates the development of participants' scores from low to higher values. Although the increase was not too sharp, this change in the pattern of score distribution shows the positive effect of moderate-rhythm squat training on leg muscle strength. For more details, see diagram 4.1 below and the appendix on page 80.

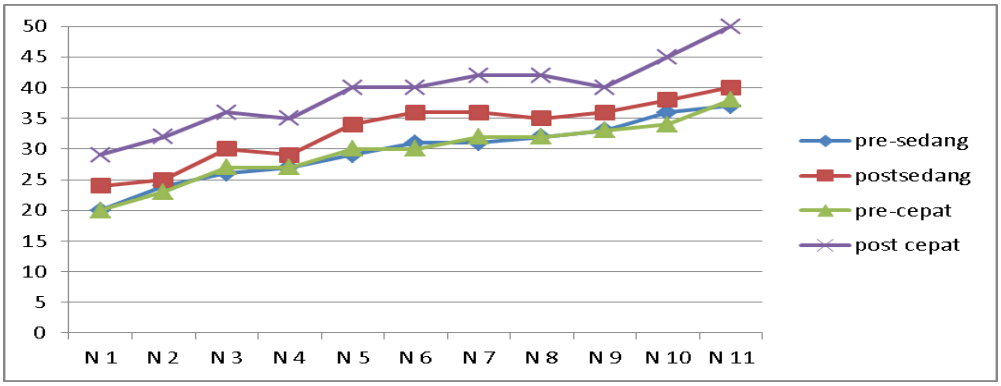


Diagram 4. 1 Diagram Data Pra-Uji dan Pasca-Uji Squat dengan Irama Cepat dan Sedang Hasil Lompat Vertikal Atlet Sasana Wushu Sanda Karo Simalem Fighter Tahun 2024

From the visualization in the diagram, it is clear that all participants experienced an increase in scores after undergoing high-speed squat training. Most participants who previously had scores between 27–29 on the pre-training test managed to improve their performance to a range of 32–34 on the post-training test. This shows a significant increase in the leg muscle strength of the athletes. This consistent increase in scores proves that the high-speed squat training method is effective in increasing leg muscle strength. Therefore, it can be concluded that the application of high-speed squat training has a positive effect and can be recommended for developing leg muscle strength in wushu sanda athletes.

Discussion

This study aims to determine the effect of high-intensity squat training and moderate-intensity squat training on leg muscle strength improvement in athletes at the Sasana Wushu

Sanda Karo Simalem Fighter. Based on the results obtained from pre-tests and post-tests, as well as statistical analyses in the form of normality tests, homogeneity tests, and hypothesis tests, it can be concluded that both training methods have a positive impact on leg muscle strength, albeit with different levels of effectiveness.

In the high-intensity squat training group, there was an increase in the average score from 29.64 to 39.18. The maximum score increased from 38 to 50, while the minimum score also rose from 20 to 29. The variance and standard deviation also increased, indicating an improvement in participant performance, albeit with a slightly wider range of results. This shows that high-intensity squat training not only improves the average score, but also has a significant effect on almost all participants. Hypothesis testing with a paired sample t-test resulted in a t-value of 11.92 with a significance value of 0.000 (<0.05), indicating that the increase was statistically significant.

Meanwhile, in the moderate-intensity squat training group, the average score also increased from 29.64 to 33.00. The maximum score increased from 37 to 40, and the minimum score rose from 20 to 24. The variance and standard deviation increased slightly, which also indicated an improvement in athlete performance, although not as strong as the fast squat group. The paired t-test results for this group yielded a t-value of 6.32 with a significance level of 0.000, which also indicated a statistically significant improvement.

When comparing the two groups based on post-training test results using an independent sample t-test, a t-value of 5.58 with a significance value of 0.000 was obtained. This indicates a significant difference between the two groups, with the fast tempo squat group showing superior results compared to the moderate tempo squat group. The difference in post-test scores of 6.18 points indicates the greater effectiveness of the fast tempo training method in improving the leg muscle strength of athletes.

These results are in line with research conducted by Azhar Fadhil Saudini (2017) in the Indonesia Performance Journal, which shows that six weeks of squat training significantly increased leg muscle strength in futsal athletes. In his study, standing board jump scores increased significantly after programmed squat training. This study reinforces the finding that training patterns involving explosive movements and fast rhythms can significantly increase leg muscle strength.

In addition, the results of this study are also supported by the findings of Shal Farra Radhi Kumala et al. (2023) in the Indonesian Journal of Sports Science and Training, which examined the effects of squat training and maximal training on leg muscle strength. The results of the study showed that squat training significantly increased leg muscle strength, even more

so than other methods. This study emphasizes that intensive load and speed in exercise movements provide optimal stimulation for muscle strength and power development.

Therefore, the results of this study are not only statistically proven but also supported by previous research. Practically, high-speed squat training can be integrated into muscle strength training programs for martial artists such as wushu sanda, who rely on explosive strength in kicking and jumping techniques. Moderate-speed squats still provide benefits, albeit on a more moderate scale, making them more suitable as an adaptation phase or variation in training periodization.

In conclusion, the high-speed squat method can be used as the primary choice for developing lower body strength in athletes at intermediate to advanced fitness levels, while moderate-speed squats are more suitable for beginners or recovery phases. A combination of both can serve as a strategic approach.

CONCLUSION

Based on the results of the study, it can be concluded that high-intensity squat training has a significant effect on increasing the leg muscle strength of athletes at the Sasana Wushu Sanda Karo Simalem Fighter. The average score in the fast-paced squat training group increased from 29.64 to 39.18, while the maximum score increased from 38 to 50 and the minimum score from 20 to 29.

Moderate-paced squat training also showed positive effects in increasing leg muscle strength, although not as much as the fast-paced training group. The pre-test average score increased from 29.64 to 33.00, with the maximum score rising from 37 to 40 and the minimum score from 20 to 24.

When comparing the two training methods, the results showed that fast-paced squats were superior in increasing leg muscle strength compared to moderate-paced squats. The average difference in post-test scores between the two groups was 6.18 points.

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