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Implementation of Resistance Training to Improve the Speed of Crescent Kicks in Pencak Silat Athletes

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Abstract

Speed is a crucial physical component in pencak silat, particularly in executing the sickle kick technique, which plays an important role in scoring effectiveness during matches. However, school-age pencak silat athletes often demonstrate limited kick speed due to insufficient specific strength and neuromuscular development. Therefore, training methods that integrate strength development with technical movement specificity are needed to optimize performance. This study aims to analyze the effect of resistance training integrated with the sickle kick technique on increasing the speed of the sickle kick of school-age pencak silat athletes. The study used a quantitative approach with an experimental method through a one-group pretest–posttest design. The subjects consisted of 10 school-age pencak silat athletes who participated in extracurricular pencak silat activities at Muhammadiyah 6 Junior High School Bandung, with a total sampling technique. The treatment was resistance training using a resistance band which was carried out for 14 meetings with a frequency of three times per week. Measurement of the sickle kick speed was carried out by counting the number of kicks executed correctly within 10 seconds towards paching during the pretest and posttest. Data were analyzed using descriptive statistics, normality tests, and paired samples t-tests at a significance level of 0.05. The results showed an increase in the average value of the sickle kick speed from 15.60 in the pretest to 18.80 in the posttest. The paired samples t-test showed a significance value of 0.000 ($p < 0.05$), indicating that resistance training significantly increased the speed of the sickle kick in school-age pencak silat athletes. This finding confirms that resistance training based on specific movement techniques is effective in developing the performance of school-age pencak silat athletes.

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INTRODUCTION

High-performance sports require the implementation of planned, systematic, and scientifically based training programs to optimize athlete performance. In martial arts like pencak silat, achievement is determined not only by mastery of techniques and tactics but also by the quality of physical condition that supports the effectiveness of those techniques.

The integration between physical and technical conditions is a crucial factor in supporting the success of athletes in competitive match situations (Bafirman & Wahyuri, 2019; Bompa & Buzzichelli, 2019).

Pencak silat is an Indonesian martial art that has developed into a competitive sport at both the national and international levels. In the sparring category, striking techniques are a key element in scoring points, one of which is the crescent kick.

The crescent kick has a curved trajectory, striking the instep, and is often used to attack an opponent's vital body parts. The effectiveness of this technique is greatly influenced by speed, as a fast kick is more difficult for an opponent to anticipate, block, or catch (Prasetiawan et al., 2025).

However, in practice, pencak silat athletes, particularly school-age athletes, still experience limited speed in executing crescent kicks. This condition makes attacks less effective and increases the risk of counterattacks from opponents.

The speed of the sickle kick is influenced by several components of physical condition, especially the strength and power of the leg muscles, neuromuscular coordination, and the efficiency of movement patterns (McGuigan et al., 2021).

Therefore, a training method is needed that not only increases muscle strength in general, but is also able to transfer specific training adaptations to the sickle kick technique.

One training method widely used in sports development is resistance training using resistance bands. Resistance bands provide elastic resistance that allows for functional increases in muscle strength and speed without altering movement patterns.

This elastic characteristic makes resistance bands effective in increasing neuromuscular activation, accelerating muscle contractions, and maintaining the match between training and match technique movements (Akhbar & Imansyah, 2023; Rohaeti & Soleh, 2024).

Several previous studies also reported that resistance band training had a significant effect on increasing the speed of the sickle kicks of pencak silat athletes (Togala & Basman, 2024; Waskito & Yusradinafi, 2021).

However, most previous research still focuses on specific club or college level athletes, with varying training designs and subject characteristics.

Furthermore, empirical studies emphasizing the direct integration of resistance training and crescent kick techniques, particularly in school-age pencak silat athletes as a fundamental phase of long-term development, are still relatively limited. However, implementing training based on the principles of specificity and movement transfer at this age stage is crucial for developing sustainable technical quality and physical condition (Mulyana et al., 2024).

This study specifically investigates the integration of resistance band training with crescent kick technique movements in school-age pencak silat athletes (12–16 years), a population that has received limited empirical attention in previous studies. Unlike prior research that primarily focused on general resistance training or older athletes, this study emphasizes movement specificity and training transfer during the fundamental development phase.

Based on these conditions, this study aims to analyze the effect of resistance training integrated with sickle kick technique movements on increasing the speed of sickle kicks in school-age pencak silat athletes.

With a pretest–posttest experimental approach, this research is expected to provide empirical evidence regarding the effectiveness of resistance training based on technical movement specificity, as well as being a practical reference for trainers in designing pencak silat training programs that are more effective, efficient, and in accordance with the demands of the competition.

METHOD

This study used a quantitative approach with an experimental method through a one-group pretest–posttest design. The research subjects consisted of 10 school-age pencak silat athletes aged between 12 and 16 years who were actively participating in extracurricular pencak silat activities at Muhammadiyah 6 Junior High School, Bandung. The entire population was sampled using a total sampling technique due to the relatively limited number of subjects (Creswell & Creswell, 2018; Thomas et al., 2022).

The treatment consisted of resistance training using resistance bands integrated with the sickle kick technique. The training program was implemented over 14 sessions, three times per week. Resistance bands were attached to the athletes' legs and used throughout the sickle kick technique, according to the planned training program.

The speed of the sickle kick was measured using a pencak silat sickle kick speed test by counting the number of kicks executed correctly within 10 seconds towards the pacing direction. Measurements were conducted during the pretest and posttest using equipment such as a pacing, stopwatch, whistle, and score sheet. The criteria for assessing sickle kick speed refer to the classification proposed by (Lubis & Wardoyo, 2014).

The data obtained were analyzed using descriptive statistics to determine the minimum, maximum, average and standard deviation values using SPSS 25 (Fadluloh et al., 2024). Next, a normality test was performed as a prerequisite for analysis, followed by a paired samples t-test to determine the difference in sickle kick speed before and after the training treatment. All statistical tests were conducted at a significance level of 0.05.

RESULTS AND DISCUSSION

Table 1. Descriptive Test

	N	Min	Max	Mean	Standard Deviation
Pretest	10	14	18	15.60	1,265
Post Test	10	17	20	18.80	.919

The results of the descriptive analysis show that in the initial test (pretest), the athlete's sickle kick speed had an average value of 15.60, with a minimum value of 14 and a maximum value of 18. After being given training treatmentresistance training, there was an increase in the final test (posttest), with an average value of 18.80, a minimum value of 17, and a maximum value of 20. The increase in the average value and the shift in the minimum and maximum values indicate an improvement in the speed of the athlete's sickle kick after following the training program.

Normality tests using Kolmogorov–Smirnov and Shapiro–Wilk show that the datapretestAndposttestnormally distributed ($p > 0.05$), so it meets the requirements for parametric statistical analysis.

The results of the paired samples t-test showed a significance value (Sig. 2-tailed) of 0.000. This significance value is less than 0.05, which indicates a significant increase in sickle kick speed after the athletes participated in resistance training.

The results of the study showed that the application of resistance training was able to increase the speed of the sickle kick of pencak silat athletes. This improvement confirms that training with elastic resistance can provide positive adaptations to the specific movement abilities required in pencak silat, especially in attack techniques that require speed, timing, and good movement coordination.

This finding is in line with modern training principles which emphasize the development of specific physical conditions according to the technical needs of the sport (Bompa & Buzzichelli, 2019). The increase in sickle kick speed can be explained by the neuromuscular adaptations that occur as a result of resistance training. Resistance band training involves dynamic contraction of the leg and pelvic muscles, thereby increasing muscle efficiency and accelerating the transmission of nerve impulses that produce movement.

This adaptation plays an important role in increasing the speed of movement in explosive activities, including kicks in pencak silat (Bafirman & Wahyuri, 2019; Mcguigan et al., 2021). Additionally, resistance training has the advantage of maintaining movement patterns that mimic the actual crescsent kick technique. This principle of specificity allows athletes to train strength and speed simultaneously without altering the fundamental mechanics of the kick. (Lubis & Wardoyo, 2014) emphasized that training that is close to competition technique movements will provide more optimal training transfer to improve athlete performance.

The results of this study also support the findings of previous studies which stated that resistance band training is effective in increasing the speed of the sickle kick. Several studies have shown that training with elastic resistance can improve the quality of pencak silat athletes' attacks by increasing speed and movement response (Akhbar & Imansyah, 2023; Rohaeti & Soleh, 2024; Waskito & Yusradinafi, 2021).

The consistency of these results shows that resistance training is a relevant and applicable training method in developing pencak silat performance. Thus, the increase in the speed of the sickle kick obtained in this study strengthens the empirical evidence that resistance training can be used as an alternative effective training method in the pencak silat athlete development program.

Implementing this training in a structured

and continuous manner is expected to increase the effectiveness of athletes' attacks in facing competitive match situations.

CONCLUSION

Implementation of the exerciseresistance trainingIt can increase the speed of pencak silat athletes' crescent kicks and provide positive adaptations to their specific movement abilities. Training patterns that mimic kicking techniques support the transfer of performance to competition situations.Resistance trainingcan be used as an effective and applicable training method in developing pencak silat performance. This training helps athletes produce faster and more efficient kicks. Therefore, the results of this study can be used as a reference in developing pencak silat training programs.

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