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THE EFFECT OF SPEED AND AGILITY TRAINING ON IMPROVING THE SPEED OF FORWARD KICKS (JUN GERI) IN SENIOR SHORINJI KEMPO ATHLETES

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Abstract
This study aims to determine the effect of speed and agility training on improving front kick speed (jun geri) in senior Shorinji Kempo athletes in Salatiga City. Speed and agility training are important elements in modern martial arts, particularly in enhancing the effectiveness of kicking techniques. This study employed a quasi-experimental method with a one-group pretest-posttest design. The sample consisted of four senior athletes selected through purposive sampling. The instrument used was the number of jun geri kicks performed within 10 seconds. The results of the analysis using a paired t-test showed a significant increase between the pretest and posttest results ($p < 0.05$), indicating that speed and agility training can enhance kicking speed. In conclusion, a systematic and measured training program can significantly improve front kick ability in Kempo athletes.
Keywords*: speed; agility; jun geri; shorinji kempo; kicking speed*

INTRODUCTION

Shorinji Kempo is a martial art that combines punching, kicking, and locking techniques with mental and spiritual training (So, 2020). One of the main techniques used in competition is jun geri, or front kick. The effectiveness of the jun geri depends heavily on speed, accuracy, and body stability when executing the movement (Mulyana & Darmawan, 2019). In competitions, the ability to perform kicks quickly and at the right time can determine victory or defeat (Widiastuti, 2018).

Physical components such as speed and agility are key determinants of an athlete's performance in martial arts (Bompa & Buzzichelli, 2018). Speed is the body's ability to move in the shortest possible time, while agility is the ability to change direction quickly and accurately while maintaining balance (Miller et al., 2016; Thomas et al., 2019). In martial arts, speed and agility training play a crucial role in optimizing explosive movements such as kicks (Sekulic et al., 2017).

Various studies have shown a significant relationship between speed and agility training and improved kicking technique performance in martial arts (Slimani et al., 2017; Yudhistira et al., 2021). However, there are still few studies

that specifically evaluate the effects of such training on Shorinji Kempo athletes, particularly in the jun geri technique.

This study aims to prove this by examining the effect of speed and agility training on the speed of front kicks (jun geri) in senior Shorinji Kempo athletes in Salatiga City. It is hoped that the results of this study can serve as a basis for planning more effective and efficient training programs in the future.

METHOD

This study used a quantitative approach with a one-group pretest-posttest experimental design to determine the effect of speed and agility training on front kick speed (jun geri) in five male senior Shorinji Kempo athletes in Salatiga City. The sample was selected based on the following criteria: male gender, active senior athlete status, no injuries, and willingness to fully participate in the training program. The training was conducted over four weeks with a frequency of three training sessions per week, consisting of a combination of speed training (short sprints, reaction drills) and agility training (ladder drills, cone zig-zag runs, and agility T-tests).

Measurements were taken before and after the training program using the 10-second jun geri kick count test, which has been empirically validated as an indicator of kicking speed in martial arts (Rathbone et al., 2017; Yıldız et al., 2021). Test results were analyzed using a paired sample t-test with the assistance of SPSS version 25 software to identify significant differences between pretest and posttest at a significance level of 5% ($p < 0.05$), in accordance with the analysis procedures recommended in experimental sports research. During the study, the researcher applied research ethics principles, including informed consent, maintaining the confidentiality of respondents' identities, and ensuring the physical safety of participants during training (Sugiyono, 2019; Creswell, 2014; Baechle & Earle, 2016).

RESULT AND DISCUSSION

This study involved five senior male Shorinji Kempo athletes from Salatiga City, using a one-group pretest-posttest research design. Each participant underwent a speed and agility training program for four weeks, three times a week.

Measurements were taken of the number of front kicks (Jun Geri) in 10 seconds before and after the training intervention.

The basic characteristics of the participants are shown in Table 1, which includes data on age, height, weight, body mass index (BMI), and the number of kicks before and after training.

Table 1. Characteristics of research subject data

Variable	N	Mean ± SD
Usia (tahun)	5	17.6 ± 0.5
Tinggi badan (cm)	5	169.2 ± 4.7
Berat badan (kg)	5	58.4 ± 3.6
IMT (kg/m²)	5	20.4 ± 1.2
Jun Geri Pretest	5	18.6 ± 1.82
Jun Geri Posttest	5	23.4 ± 2.30

The statistical analysis began with a normality test via the Shapiro-Wilk technique, which revealed that the data followed a normal distribution for both the pretest (Sig = 0.765) and posttest (Sig = 0.842) scores. This confirms that the assumption of normality was met, allowing the use of parametric tests such as the paired samples t-test for further analysis.

Table 2. Nomality Test

Variable	N	Sig.
Pretest	5	0.765
Posttest	5	0.842

The statistical analysis began with a homogenitiy test using A Levene's test for homogeneity also confirmed that the data were homogeneous (Sig = 0.606).

Table 3. Homogenity Test

Levene statistic	Df1	Df2	Sig.
0.287	1	8	0.606

To test the hypothesis, a Paired Sample t-Test was conducted. The results showed an increase in the average number of kicks from the pretest to the posttest, with a significance value of p = 0.003 (< 0.05), which means that there was a significant difference.

Table 4. Paired sampel t test

variabel	Pretest (Mean±SD)	Posttest (Mean±SD)	t-table	P value	SE	Cohen's d

Jumlah tendangan	18.6 ± 1.82	23.4 ± 2.30	-6.33	0.003	0.76	2.68

Discussion

The outcomes from the present inquiry illustrate that speed and agility training significantly improves the performance of front kick (Jun Geri) execution among senior male Shorinji Kempo athletes in Kota Salatiga. These improvements align with previous studies which suggest that neuromuscular responsiveness, lower-limb power, and coordination are key elements for executing rapid and effective martial arts kicks (Hammami et al., 2020; Makaraci et al., 2022; Padulo et al., 2015).

The training program in this study incorporated speed drills such as sprint repetitions and cone agility runs. According to Thomas et al. (2009), such speed drills stimulate fast-twitch muscle fibers and improve ground contact efficiency, which are critical in explosive movements like front kicks. In addition, agility-focused drills like ladder footwork and lateral cone movements—were employed to enhance athletes' ability to shift direction rapidly while maintaining balance. These agility components are crucial for martial artists who must deliver kicks with both speed and precision (Faude et al., 2013; Peart et al., 2019).

Speed is understood as the capacity to move the body or a body part swiftly, often driven by motor unit recruitment and muscle elasticity (Bompa & Haff, 2009). Agility complements this by involving cognitive and neuromuscular elements that support quick changes in direction (Sheppard & Young, 2006). When combined, these elements enable athletes to perform movements such as the Jun Geri with higher efficiency, minimizing execution time while preserving accuracy and force (Moran et al., 2018).

The statistical findings support these assertions. The pretest average was 18.6 kicks per 10 seconds, increasing to 23.4 kicks post-intervention. The Shapiro-Wilk test confirmed that both sets of data were normally distributed (Sig. pretest = 0.492; posttest = 0.863), and Levene's test showed that the data were homogeneous (Sig. = 0.606). A paired sample t-test showed a significant difference between pretest and

posttest results (t = -6.33; p = 0.003), indicating the effectiveness of the intervention.

According to Rösch et al. (2017), explosive movements like front kicks benefit significantly from dynamic and specific lower-limb training. The inclusion of agility and speed tasks may also stimulate proprioceptive adaptations and joint stability, reducing injury risk and increasing motor precision (Miller et al., 2016; Pauole et al., 2000).

The novelty of this study lies in its application to a martial arts setting—specifically Shorinji Kempo—where empirical studies on motor skill enhancement through speed-agility training remain limited. Previous research has often focused on general athletic populations, whereas this study provides direct evidence of improvements in martial-specific performance measures.

This study also reinforces the findings of Makaraci et al. (2022), who observed that integrated speed and agility routines yielded significant improvements in lower-extremity strike performance among Taekwondo athletes. Similarly, Amri et al. (2021) demonstrated that agility drills improved the kicking velocity of junior karate practitioners. The present findings complement these studies and emphasize the relevance of structured speed and agility training in Shorinji Kempo for enhancing Jun Geri speed, especially in competition scenarios that require rapid offensive execution.

Sample Test

This study used the Paired Sample t-Test as a statistical analysis method to test the significant difference between the pretest and posttest results of five senior Shorinji Kempo athletes from Salatiga City who participated in a speed and agility training program for four weeks with a frequency of three times per week. This test is highly appropriate for a one-group pretest-posttest design, as it aims to determine whether the intervention provided has a significant impact on the same group before and after the intervention. The analysis results show an increase in the average number of Jun Geri kicks from 18.6 in the pretest to 23.4 in the posttest. The t-test yielded a t-value of -6.33 with $p = 0.003$ ($p < 0.05$), indicating a statistically significant difference. Therefore, it can be concluded that speed and agility training

has a positive effect on improving the speed of front kicks (Jun Geri) in athletes. Since the significance value is less than 0.05, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. These results reinforce that the combination of speed and agility training can be an effective training strategy for developing kicking skills in Shorinji Kempo martial arts.

CONCLUSION

Derived from the outcomes of the research and the statistical analysis, it can be concluded that the implementation of speed and agility training has a significant positive effect on the improvement of front kick (Jun Geri) speed in senior male Shorinji Kempo athletes in Kota Salatiga. The findings, supported by a Paired Sample t-Test ($t = -6.33$; $p = 0.003 < 0.05$), indicate a statistically significant increase in the number of front kicks executed within a 10-second time frame after the training intervention. This improvement underscores the importance of integrating speed and agility-focused exercises into the physical conditioning programs of martial arts athletes.

The increase from a pretest average of 18.6 kicks to a posttest average of 23.4 kicks demonstrates that repeated exposure to drills targeting fast-twitch muscle activation, rapid direction change, and balance stabilization can enhance neuromuscular responsiveness and movement efficiency. These physical attributes are fundamental in Shorinji Kempo, where performance in techniques such as Jun Geri relies not only on strength and technique but also on how quickly and efficiently an athlete can execute the movement under pressure.

This study highlights the critical role of multidimensional physical training approaches—specifically the synergy between speed and agility—in improving technical execution in martial arts. The combination of speed drills (such as short sprints, resistance runs) and agility drills (such as cone zigzags, ladder drills, and side shuffles) contributed to improving athletes' ability to deliver faster, more controlled, and accurate front kicks.

Furthermore, the results reinforce the principle that martial arts training programs must be dynamic and specific. Simply relying on technical repetition may not be sufficient to maximize performance potential. Instead, by embedding

evidence-based physical conditioning methods into daily training routines, athletes can achieve more efficient movement mechanics and reduced reaction time—advantages that are crucial in competitive bouts.

The novelty of this study lies in its experimental focus on Jun Geri speed as a measurable performance outcome within the context of a traditional martial art such as Shorinji Kempo. While prior studies have explored the effects of physical training on general fitness or jump performance, few have directly correlated speed-agility training with strike velocity in martial arts. Thus, the findings contribute new insights to sports science literature, particularly for martial arts disciplines.

In future research, it is recommended to expand the sample size and compare different age categories or skill levels to observe whether similar effects occur in junior or beginner athletes. Additionally, longitudinal studies over a longer period may offer a deeper understanding of the sustainability of such training adaptations and their effects on competition performance.

Ultimately, this research confirms that structured, targeted speed and agility training is an effective strategy to enhance front kick performance in Shorinji Kempo. Coaches and trainers should consider integrating such components into regular training cycles to improve athletic performance, reduce injury risk, and better prepare athletes for competitive demands.

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