

# Zig-Zag and Shuttle Run Training on the Results of the Agility of Karateka

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## ABSTRAK

Kelincahan atlet Karate masih rendah. Terbukti saat mengikuti pertandingan tampak kurang lincahnya gerakan atlet saat menghindari serangan lawan. Tujuan dari penelitian ini adalah untuk menganalisis latihan zig-zag dan shuttle run dalam meningkatkan kelincahan pada Karateka. Penelitian ini menggunakan metode quasi eksperimen dengan rancangan pre-test dan post-test design control group. Populasi dalam penelitian ini adalah seluruh atlet Karateka yang terdiri dari 20 orang atlet putra dan 18 orang atlet putri. Adapun sampel yang digunakan adalah sebanyak 20 atlet putra yang masih aktif latihan. Metode pengumpulan data menggunakan observasi, tes dan dokumentasi. Teknik analisis data menggunakan analisis kuantitatif. Hasil penelitian menunjukkan latihan shuttle run memberikan pengaruh yang berarti terhadap peningkatan kelincahan ( $t_{hit}$  sama dengan 60,42 lebih dari  $t_{tab}$  sama dengan 2,26). Latihan zig-zag memberikan pengaruh yang berarti terhadap peningkatan kelincahan ( $t_{hit}$  sama dengan 159,06 lebih dari  $t_{tab}$  sama dengan 2,26). Latihan zig-zag run lebih efektif dalam meningkatkan kelincahan dibandingkan dengan latihan shuttle run ( $t_{hit}$  sama dengan 26,64 lebih dari  $t_{tab}$  sama dengan 2,26). Simpulan dari penelitian ini yaitu latihan dengan metode zig-zag run lebih efektif dalam meningkatkan kelincahan pada Karateka. Implikasi penelitian ini diharapkan dapat meningkatkan unsur kelincahan bagi atlet sehingga prestasi dapat dicapai.

## ABSTRACT

The agility of Karate athletes is still low. It is evident that when participating in the match, the athlete's movements appear to be less agile when avoiding the opponent's attack. The purpose of this study was to analyze zig-zag and shuttle run training in improving agility in Karateka. This study used a quasi-experimen method with a pre-test and post-test design control group. The population in this study were all Karateka athletes consisting of 20 male athletes and 18 female athletes. The sample used was 20 male athletes who were still actively training. Data collection methods used observation, tests and documentation. Data analysis techniques used quantitative analysis. The results showed that shuttle run training had a significant effect on increasing agility ( $t_{hit}$  equal to 60.42 more than  $t_{tab}$  equal to 2.26). Zig-zag exercise gives a significant effect on increasing agility ( $t_{hit}$  equal to 159.06 more than  $t_{tab}$  equal to 2.26). Zig-zag run training is more effective in increasing agility compared to shuttle run training ( $t_{hit}$  equal to 26.64 more than  $t_{tab}$  equal to 2.26). The conclusion of this study is that training with the zig-zag run method is more effective in increasing agility in Karateka. The implication of this research is expected to increase the element of agility for athletes so that achievement can be achieved.

## 1. INTRODUCTION

Karate is the science of self-defense with bare hands or without weapons, which is also one of the great martial arts branches (Elisa et al., 2019; Hudain et al., 2020). This sport does not only teach physical aspects, such as skills in fighting but also places great emphasis on teaching aspects of mental discipline (Przybylski et al., 2021; Sari et al., 2021). Karate contains profound philosophical aspects, so that by studying karate, our mind, soul, and body as a whole will be grown and developed. (Lystad et al., 2020). Karate requires excellent physical condition, which is caused by the high intensity of movement in carrying out each movement technique. One of the physical conditions that must be possessed is (Alp et al., 2020).

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Agility is a very important physical component in the advancement of movement techniques. Agility is the ability to change direction or body position quickly when combined with other movements (Tofikin, 2020; Wahono et al., 2017).

In fact, there is a decline in the physical condition of athletes, one of which is their lack of agility in movement (Cahyono et al., 2022; Yuliana et al., 2022). When viewed from matches and training, the skill of karate athletes at Dojo Ziezoyuki Academy can still be said to be low. It was proven when I followed the match some time ago. Based on direct observation, it appears that the athlete's movements are less agile when avoiding an opponent's attack so that the opponent can easily anticipate a given attack. In this match, agility is needed, namely when carrying out attacks, changing steps, and doing counters to avoid attacks from opponents. If the athlete does not have the skill, it will be difficult to anticipate the opponent's attack. In addition, agility is needed when athletes defend and also avoid sudden attacks because it requires speed in turning and skill in changing direction and body movements.

The solution to improving good physical condition is to carry out agility training. The various forms of agility training are shuttle run, zig-zag run, wind sprint, square sprint, dot drill, tree cone drill, down-the-line drill, grass drill, and starting and stopping run. One exercise that can be applied to improve agility is the zig-zag and shuttle run exercises. Zig-zag training is a form of agility training using stakes (Tofikin, 2020). The activities of carrying out athletes run as fast as possible by turning from one area to another, passing several existing stakes, and not forgetting the principles of zig-zag training, namely running as fast as possible between two boundaries that are approximately 2.4 meters apart to give challenge. This exercise can be done quickly (Fransiska et al., 2021; Ruslan et al., 2021; Tofikin, 2020). Shuttle runs are one of the exercises to improve agility. Shuttle Run is a form of general agility training. This exercise consists of two points, each 4-5 meters apart (Malasari, 2019; Muslihin et al., 2020). This is because if the distance is too far, it is feared that the players or students, after several times running back and forth, will no longer be able to restore their bodies quickly due to fatigue.

The previous findings stated that agility contributes to ability in sports, so athletes who do not have agility will lose their balance, which will become an obstacle to the implementation of an achievement in the sport they are engaged in (Muslihin et al., 2020; Ruslan et al., 2021). There is an influence of zig-zag running agility training on the ability to dribble in soccer games (Ilahi et al., 2021; Kardani et al., 2020). Shuttle-Run and Zig-Zag Run exercises for agility (Fransiska et al., 2021; Malasari, 2019). The application of shuttle-run and zig-zag-run exercises is expected to help improve the agility of athletes. Because of this, many athletes' agility levels are still low. This study aims to analyze the effects of shuttle runs and zigzag training methods on the agility of Karate athletes at Dojo Ziezoyuki Academy. This research is expected to increase the element of agility for athletes so that achievements can be achieved.

## 2. METHOD

This study used a quasi-experimental research method (quasi-experiment). Quasi-experimental research is research that approaches real experiments where it is impossible to control all relevant variables. The design used in this study is the pre-test/post-test group design. In other words, this research design uses data, namely by conducting a pre-test and post-test. The first measurement was carried out through an initial test (pre-test), and the second measurement was carried out through a post-test. The initial test was carried out with the aim of collecting data before being given treatment (training), and the final test was carried out to collect data after being given treatment for 18 meetings.

This research was conducted at Dojo Ziezoyuki Academy, one of the training sites in Singaraja City. The time of this research was conducted from 20th February to 15th March 2023. The population in this study were all Karateka athletes at Dojo Ziezoyuki Academy, consisting of 20 male athletes and 18 female athletes. The samples used in this study were 20 male athletes who were still actively training at Dojo Ziezoyuki Academy, Singaraja City. The data obtained in this study are shuttle-run and zig-zag-run data on increasing the agility of Karate athletes at Dojo Ziezoyuki Academy. Methods of data collection using observation, tests, and documentation. Data analysis techniques using quantitative analysis, and data testing using two methods, namely partial test (partial t) and t-test.

## 3. RESULTS AND DISCUSSION

### Results

This study aims to determine whether there is no significant effect of the treatment (training method) and to determine whether there is a difference in the effectiveness of the two exercises, namely the Shuttle-run and Zig-zag run exercises, so data testing is carried out using two methods, namely the partial (partial t) and t test. The results of data processing are presented in Table 1.

**Table 1.** Results of Data Processing

Variable	t <sub>hit</sub>	T-test		(P)	(α)	Ket.
		T <sub>tab</sub>	df			
Shuttlerun	60,42	2,26	9	0,000	0,05	Sig.
Ziq-zaq	159,06	2,26	9	0,000	0,05	Sig.

The first finding is the effect of shuttle run training on agility. Based on the results of the analysis, it can be seen that the t test in the final test of the agility of Karate Dojo Ziezoyuki Academy athletes using the Shuttle-run exercise has a value of  $t_{hit} = 60.42$  and a value of  $t_{tab} = 2.26$  with  $df = 9$  at a significance level of 5%. The value of  $t_{count} > t_{table}$ , and the Probability (P) value of 0.000 ( $<0.05$ ), it can be concluded that  $H_0$  is rejected and  $H_a$  is accepted, meaning that there is a significant effect on increasing agility. The second finding is the effect of ziq-zaq run training on agility. Based on the results of the analysis, it can be seen that the t test in the final test of the agility of Karate Dojo Ziezoyuki Academy athletes using the Ziq-zaq-run exercise has a value of  $t_{hit} = 159.06$  and a value of  $t_{tab} = 2.26$  with  $df = 9$  at a significance level of 5%.  $t_{count} > t_{table}$ , and a probability (P) value of 0.000 ( $<0.05$ ), it can be concluded that  $H_0$  is rejected and  $H_a$  is accepted, meaning that there is a significant effect on increasing agility. There was a significant difference in the effect of the post test results between the shuttle run training group and the ziq-zaq run exercise on increasing agility  $t_{hit} = 26.64 > t_{tab} = 2.26$ . The average increase in agility is presented in Table 2.

**Table 2.** Average Agility Improvement

GroupExercise	Pre-test	Post-test	Enhancement
Shuttle run	15,53	12,42	3,11
Ziq-zaq	15,32	10,23	5,09

Based on these calculations, the third hypothesis proposed in this study is accepted. If  $t_{count}$  is greater than  $t_{table}$ , then  $H_a$  is accepted and  $H_0$  is rejected. This means that the Ziq-zaq run exercise shows a more significant increase when compared to the Shuttle run exercise.

## Discussion

The first finding is the effect of shuttle run training on agility. Shuttle runs are one of the exercises to improve agility (Abdessalem et al., 2019). Agility is a form of movement that requires a person or player to move quickly, change direction, and be agile. An agile player is a player who moves without losing balance or awareness of his body position (Sutini, 2018; Wahyudi, 2018). Therefore, various exercises are needed to improve agility. Training is a work process that must be carried out systematically, repeatedly, and continuously, and the longer the workload has given, the greater the workload increases (Juntara, 2019; Listiana et al., 2019; Muslihin et al., 2020). Repetitive means that movements that were previously difficult to do become easier, automatic, and reflective in their implementation so as to save more energy.

The second finding is the effect of ziq-zaq run training on agility. This is because the purpose of zig-zag training is to master running skills, avoiding various obstacles, both people and objects. running skills by avoiding various obstacles, both people and objects. The purpose of the zig-zag is divided into two, categories: zig-zag exercises to measure one's agility include practicing running triangles with a predetermined size of triangle lines, practicing running in the shape of a star with a predetermined size of a star-shaped line, and zig-zag exercises to change the direction of movement of the body or body parts, including running practice of figure eight, running following figure eight, and running past the obstacle when running will form a zig-zag line (Malasari, 2019; Tofikin, 2020). Training is a process or period of time that lasts for several years, until the athlete reaches a high standard of performance (Fransiska et al., 2021; Malasari, 2019).

Based on the results of the study, it showed that there was a significant effect on increasing agility from the application of the Ziq-zaq run exercise and the shuttle run exercise. The ziq-zaq run exercise shows a more significant improvement when compared to the shuttle run exercise. This finding is reinforced by the findings of previous research, which stated that agility contributes to ability in sports so that athletes who do not have agility will lose balance, which will become an obstacle to their achievement in the sport they are engaged in. (Muslihin et al., 2020; Ruslan et al., 2021). There is an influence of zig-zag running agility training on the ability to dribble in soccer games (Ilahi et al., 2021; Kardani et al., 2020). Shuttle-Run and Zig-Zag Run exercises for agility (Fransiska et al., 2021; Malasari, 2019). From the discussion, the average value of the pre-test with the shuttle-run and zig-zag training methods has a different average value. However, this value cannot be used as a reference in determining which method is

more effective, because determining which method is more effective between the shuttle-run training method and the zig-zag method in increasing agility, can only be done by looking at the increased value of the two methods.

#### 4. CONCLUSION

Research shows that there is an effect of training using the Shuttle-run training method on increasing the agility of Karateka. There is an effect of training using the Zig-zag training method on increasing the agility of Karateka. Training with the Zig-zag method is more effective in increasing the agility of Karateka at Dojo Ziezoyuki Academy.

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