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Article

The effect of resistance and plyometric training methods with concentration on ability mawashi geri men's junior karate athlete dojo tako simalungun district

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ABSTRACT

Karate athletes must master mawashi geri. To maximize athlete performance, Resistance and Plyometric Training Methods must be used. This study examines how resistance and plyometric training affects Mawashi Geri proficiency. Simalungun junior karate practitioner Putera Dojo Tako. A 2x2 factorial experimental design is used in this investigation. The study included 32 Simalungun-based junior karate athletes from Putera Dojo Tako. Grid concentration and mawashi geri kicking proficiency tests were used. Two-way ANOVA and the Tukey test were used to analyze the data. The research shows that resistance and plyometric training improve karate contestants' mawasahi geri kicks. Next, strength training and plyometric training affect karate athletes' mawasahi geri kick performance. At Dojo Tako in Simalungun, male junior karate participants' mawasahi geri kicks varied, especially when performed with attention and passion. Male junior karate athletes at Dojo Tako, Simalungun Regency, who received resistance and low-intensity plyometric training showed variances in mawasahi geri kicking proficiency.

Keywords:

Resistance training,
Plyometric training,
Concentration,
Mawashi geri

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Introduction

Sport plays a vital role in human life, fostering heightened competition among nations and countries. Sport is a structured endeavor aimed at enhancing and refining both physical and spiritual capabilities, as well as fostering interpersonal contact (Alisher, 2023; Endrianto, 2019; Yoda, 2020). The objective of performance sports is to enhance athletic performance and optimize the auxiliary elements of sports. Karate is one of the sports that significantly contributes to success in Indonesia (Ningsih, Mistar, & Rangkuti, 2021; Utami, 2015). This sport is classified as an achievement sport due to its participation in formal tournaments at the national, regional, and even worldwide levels. Karate contests consist of two distinct categories, called KATA and KUMITE, which are organized according to participants' body weight and age (Hutabarat, Sukendro, & Muzzafar, 2021; Ummayum, Umar, Alnedral, & Setiawan, 2023). Based on the evolution of karate laws, the performance standards in the sport of karate encompass enhancing physical fitness, technical proficiency, strategic acumen, and emotional maturity. In coaching, it is essential for a coach to focus on the supporting variables in order to achieve maximum performance (Izet et al., 2023; Marlina et al., 2023; D. P. Susanti, Bahri, & Prayogo, 2023).

Efficient and systematic karate training is essential to ensuring optimal athlete development. Mastery of fundamental karate techniques is crucial for athletes to achieve their full potential. The fundamental skill that must be acquired is the art of doing it accurately, precisely, and methodically (Manolachi et al., 2023; Vesković, Koropanovski, Dopsaj, & Jovanović, 2019). In order to execute a technique, an athlete must optimize its effectiveness by ensuring correct execution and precision while being directed by the intended purpose of the method. The Mawashi Geri technique, specifically in karate, is a highly recognized and frequently employed kick in contests. In addition to its simplicity, it also yields excellent results. Multiple research findings indicate that the utilization of Mawashi Geri as the primary technique in athletic competitions remains uncommon (Hariri & Sadeghi, 2018; López, Díaz, Pérez, & Medina, 2022; Udara & Chandana, 2021). This is primarily due to the limited availability of facilities and infrastructure, resulting in infrequent and less rigorous training sessions. Consequently, some coaches prioritize punching techniques, leading to monotonous and repetitive training routines. As a result, athletes may lack discipline in their commitment to training.

This phenomenon is also encountered at the karate training facility known as the Dojo, specifically the Dojo Tako. Simalungun Regency is a training center that focuses on the development and long-term preparation of exceptional athletes between the ages of 11 and 17. The issue lies in the deficiency of junior karate athletes' Mawashi Geri proficiency. The location is Putera Dojo Tako in Simalungun Regency (Ardilla, 2020). The kicking ability of Mawashi Geri at the Karateka Dojo Tako, Simalungun Regency, should be enhanced by training that incorporates well-structured plyometric and resistance training techniques. The plyometric training method aims to integrate rapid and forceful movements to generate explosive power (Priyoko & Januarto, 2022; Priyono & Yudi, 2019; R. Susanti, Sidik, Hendrayana, & Wibowo, 2021). Conversely, the resistance training method focuses on enhancing muscle strength through exercises that involve exerting force against the body's own resistance (Fisher, Steele, Bruce-Low, & Smith, 2011; Zouita et al., 2023).

In addition to focusing on the specialized training aimed at enhancing the kicking proficiency of Mawashi Geri, it is imperative to also prioritize the athlete's degree of concentration. Numerous studies have shown that using drill techniques and skipping exercises can improve focus (Burlot, Richard, & Joncheray, 2018; McGowan, Pyne, Thompson, & Rattray, 2015; Whelan, Kenny, & Harrison, 2016). Utilizing skipping workouts or drill exercises is not erroneous; nonetheless, as sports progress, it is imperative that the approaches used adapt to align with the latest advancements in the field. The study employed plyometric and resistance methods for investigation. Therefore, it is imperative to employ these two techniques during specialized training sessions specifically aimed at enhancing one's kicking proficiency in Mawashi Geri. This initiative aims to enhance the proficiency of Dojo Tako karate athletes in Simalungun Regency.

Method

Research procedure

This study employs an experimental approach utilizing a two x two treatment by level design, specifically a factorial experiment incorporating two components (Sugiyono, 2016). The treatment was administered over a duration of 4 weeks, with a training frequency of 4 sessions per week in each group. The treatment consisted of a total of 16 sessions, which included 2 additional sessions for conducting pre-tests and post-tests to gather data on the Athlete's Mawashi Geri Concentration and skills. The research was conducted in Dojo Tako, located in Simalungun Regency, North Sumatra Province. Dojo Tako is actively engaged in training activities at the PP (Pancasila Youth) Hall in Simalungun Regency.

Research population and sample

The study population consisted of 65 individuals who were all athletes from Dojo Tako in Simalunngun Regency. The research employed a matching sample technique, wherein people from both the control and experimental groups were matched. The research sample comprised 32

individuals, including 16 participants in the high concentration score group and 16 participants in the low concentration score group. The sample of 32 individuals was stratified using matching techniques into four treatment groups. Two groups underwent Resistance approach training, categorized as high and low concentration, while the other two groups underwent plyometric method approaches, also categorized as high and low concentration.

Data collection

Data collection refers to the process of gathering and recording information or data for analysis and interpretation. This study employs a testing apparatus designed to assess the proficiency of Mawashi Geri. The conducted tests consisted of an initial concentration test performed prior to the athlete undergoing treatment using resistance training methods and plyometric training methods. This was followed by a final post-test conducted after the athlete got the training. The utilized test instruments included grid concentration tests and mawashi geri kicking skill assessments.

Data analysis

A data analysis was conducted to examine the research hypotheses, specifically the first hypothesis which posits that the resistance training approach and plyometric training have an impact on the mawasahi geri kick ability of male junior karate athletes from Dojo Tako, Simalungun Regency. 2) Second point. The second hypothesis posits that there exists a correlation between the Resistance technique and plyometric training, specifically in relation to the impact on the Mawasahi Geri kicking ability of male junior karate athletes at Dojo Tako, Simalungun Regency. Utilizing resistance training and plyometric methods. 4) The influence of the Mawashi Geri ability in male junior athletes at Dojo Tako, Simalungun Regency, varies depending on their level of focus and the training style used, either Resistance training or Plyometry style.

Table 1. 2x2 factorial research design

Concentration (B)	**Practice**	
	Resistance Training Method (A1)	**Plyometric Training Method (A2)**
High (B1)	A1 B1	A2 B1
Low (B2)	A1 B2	A2 B2
	Mawashi Geri Ability Results	

The research used a data analysis technique known as two-way analysis of variance (ANOVA) (Hermawan, Bambang, T., 2020). The data from this research was analyzed using a two-way ANOVA calculation, using the 2x2 factorial design. The significance level chosen for the analysis was $\alpha = 0.05$. The research hypothesis was tested using the two-way analysis of variance (ANOVA) technique. Subsequently, an additional examination was conducted utilizing the Tukey Test. The purpose of employing the two-way ANOVA technique is to ascertain the distinct influence of the independent variables on the experimental outcomes (main effect) and to identify the interaction effect.

Results and Discussion

The primary factors examined in this research are the impact of resistance training and plyometric training on the proficiency of the mawasahi geri kick in junior karate athletes at Dojo Tako, Simalungun district. Additionally, the study investigates the combined effect of training approach and training concentration on the same kick ability in these athletes. The data analysis calculations are displayed in the subsequent table.

According to the data presented in table 2, the calculation results of the first hypothesis indicate that the impact of resistance training and plyometric training on the mawasahi geri kick ability of karate athletes is significant. The Fcount value of 4.98 is greater than the Ftable value of 4.20,

indicating that the training approach, specifically the resistance method and plyometric training, has a noticeable effect on the ability results. The male junior karate participants from Dojo Tako in Simalungun district are practicing the mawasahi geri kick. The findings from the initial hypothesis testing revealed that male junior karate athletes at Dojo Tako, Simalungun district, who underwent resistance training, demonstrated improved mawasahi geri kick ability compared to junior karate athletes who did not receive such training. I am the offspring of Dojo Tako, hailing from Simalungun Regency. I belong to the faction that specializes in Plyometric training. Put simply, the planned research hypothesis has been conclusively validated. Based on these findings, it can be concluded that resistance training is more efficacious in enhancing the mawasahi geri kicking skill of male junior karate players at Dojo Tako, Simalungun district compared to plyometric training.

Table 2. Two Way Anova Results on Mawasahi kicking ability results data Geri, junior karate athlete for the son of Dojo Tako, Simalungun district

Sources of Variance	JK	Db	RJK	F count	F-tabel alpha=0,05	Inform
Practice Method Approach (A)	17	1	16,53	4,98	4,20	Sig
Concentration (B)	57,78	1	57,78	9,93	4,20	Sig
AB Interaction	30	1	30,03	6,60	4,20	Sig
Deep Mistakes	233,38	28	8,33	-	-	
Total	337,72	31		-		

As previously indicated in theoretical research, ability refers to an individual's cognitive and physical capability to perform specific tasks and duties. Mawashi Geri, on the other hand, is a type of side kick in which the kicking motion follows a curved trajectory resembling an arc, originating from the outer side and moving towards the inner side, with the target positioned either in front or to the side. Mawashi Geri kicks employ the posterior part of the foot to strike targets such as the face, neck, and back. The effectiveness of Mawashi Geri relies on the proficiency of each athlete in mastering the skills, particularly the strength and quality of their leg muscles (Przybylski, Janiak, Szewczyk, Wieliński, & Domaszewska, 2021; Zago et al., 2015). Effective kicking necessitates strong leg muscles, explosive strength, and precise technique. Utilizing resistance and plyometric training methods can enhance kicking performance. Instructions for executing the resistance and plyometric training strategy involve sequentially performing a set of exercises. Coaches can systematically organize training programs, beginning with simple movements that athletes can easily comprehend, so facilitating their understanding of the training exercises provided. In the resistance and plyometric training technique, the training movements are performed in alternating intervals with periods of rest (de Villarreal, Requena, Izquierdo, & Gonzalez-Badillo, 2013; MacDonald, Lamont, & Garner, 2012). This allows for the optimal mastery of each exercise. Furthermore. The trainer will experience enhanced ease in elucidating the executed moves .

Table 2 also shows the calculation of the second hypothesis of the effect of the interaction between the Resistance method and plyometric training with Concentration on the results of the mawasahi geri kick ability of karate athletes, showing that Fcount = 9.93 > Ftable = 4.20. It was concluded that there was an interaction between the resistance method and plyometric training with concentration on the results of the Mawasahi Geri kicking ability of the male junior karate athletes of Dojo Tako, Simalungun Regency. The results related to testing the interaction hypothesis, proved that there was an interaction between the training approach and the concentration of the male junior athletes of Dojo Tako Regency. simalungun in its influence on the results of Mawashi Geri's abilities, or in other words, that the proposed research hypothesis has been significantly tested. The group of members with high concentration who trained with resistance training obtained higher Mawashi Geri ability results when compared to the plyometric training group. In the group with the low concentration category who trained with resistance and plyometric exercises, the difference was slight when compared with the group of members with the same concentration category.

Table 3. Results of Advanced Stage ANOVA with Tukey's Test

Comparison Group	Qh	Qt (= 0.05)	Information
(A1B1) and (A2B1) Resistance Training with High Concentration (A1B1) and Plyometric Training with High Concentration (A2B1)	8,44	4,04	Significant
(A1B2) and (A2B2) Low Concentration Resistance Training (A1B2) and Low Concentration Plyometric Training (A2B2)	4,25	4,04	Signifikan

Put simply, there is a notable disparity among this particular classification of plyometric training. Hence, it may be inferred that there is a synergistic impact between the training methodology and focus on the outcomes of the Mawashi Geri technique. The results of Mawashi Geri's skills are influenced by both the training strategy and focus. In other words, the impact of the training approach on the abilities of Mawashi Geri depends on concentration. Concentration refers to the capacity to direct one's attention towards a task by utilizing both internal and external inputs (Gustian, 2016; Iñigo Mujika, 2017; Nusufi, 2016). The internal stimulus in question refers to disruptions in both sensory and cognitive functions.

The Figure 1 depicts the results of Advanced Stage ANOVA calculations with Tukey's Test, with group comparison Resistance Training with High Concentration (A1B1) and Plyometric Training with High Concentration (A2B1), Low Concentration Resistance Training (A1B2) and Low Concentration Plyometric Training (A2B2) as follows:

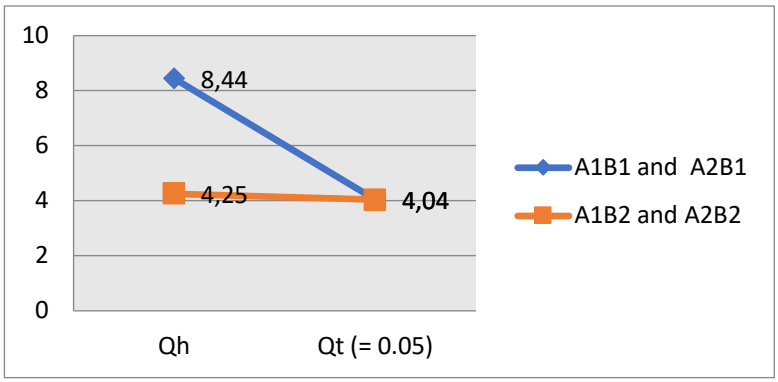

Figure 1. Results of Advanced Stage ANOVA with Tukey's Test

According to the findings in table 3 and figure1, the Tukey test results for the third hypothesis indicate a significant difference in the impact of resistance methods and plyometric training at high concentration on the mawasahi geri kicking ability of male junior karate athletes at Dojo Tako, Simalungun district. The average score of the Mawasahi Geri kick ability results of male junior karate athletes at Dojo Tako, Simalungun Regency, group A1B1 is 50.62, while for group A2B1 it is 47.25. The value of (Qh = 8.44 > Qt = 4.04) indicates a significant difference between the two groups. It is evident that the resistance training technique (A1B1) in the high concentration group is superior than the plyometric training strategy (A2B1). The findings from testing the third hypothesis indicate that within the high concentration group, the Resistance training method yields superior results in kicking ability compared to Plyometric training. The individual is a male junior karate athlete from the Dojo Tako in the Simalungun district. Put simply, the study hypothesis that was proposed has been confirmed. Within the realm of intense focus, there was a notable impact on enhancing the mawasahi geri kicking proficiency of male junior karate competitors at Dojo Tako, located in the Simalungun district. Concentration refers to the state in which an individual is fully attentive to the form of a

specific object. In sports, concentration plays a crucial role. When an athlete loses or is disrupted in their concentration during training, it can be challenging. It is worth noting that the more one practices concentration, the better they become at maintaining high levels of focus.

Training in the high concentration category leads to an increase in resistance. This training approach utilizes high intensity and follows a consistent and systematic method to develop automatic movement patterns (Przybylski, et al., 2021; Silva, Nassis, & Rebelo, 2015). It necessitates a high level of concentration to minimize the risk of injury, as it focuses on the training material. This method involves training male junior athletes from Dojo Tako, Simalungun Regency to concentrate on the prepared training material. The coach's direct judgment of their mistakes greatly motivates the pupils to engage in the training. Once the proper Mawashi Geri method has been mastered, athletes can perform other exercises with confidence, as they are already familiar with the precise form of Mawashi Geri. The coach only needs to tailor the exercises to enhance the athletes' Mawashi Geri abilities to the fullest extent (Ihsan, 2020; Simanjuntak, 2019).

Additionally, the fourth research hypothesis posits that there are disparities in the outcomes of mawasahi geri kicking proficiency among male junior karate athletes at Dojo Tako, Simalungun Regency, who were subjected to resistance techniques and low-intensity plyometric training. Agreed. The superiority of the mawasahi geri kick ability results of male junior karate athletes at Dojo Tako, Simalungun Regency, can be observed from the average score. In group A2B2, the average score is 46.50, which is higher and has a considerable influence compared to A1B2, where the average score is 46 (Qh = 4.25 > Qt = 4.04). It can be inferred that in the low concentration category, the plyometric training approach (A2B2) has a greater and statistically significant impact on the mawasahi geri kick ability of male junior karate athletes at Dojo Tako, Simalungun district, compared to the resistance training approach (A1B2).

In the realm of diminished concentration, the efficacy of Mawashi Geri's capabilities is impacted. Concentration refers to the capacity to direct one's attention towards a specific objective and consistently strive to perform optimally (Priyono & Yudi, 2019; Simanjuntak, 2019). Plyometric training is known to enhance muscle explosive strength and quick response, making it an effective method for improving performance in the low concentration category. Plyometric exercises, such as hops and skips, consist of rapid muscle contractions followed by eccentric contractions, which contribute to the development of balance and body control necessary for executing the Mawashi Geri technique. Furthermore, plyometrics enhance the velocity of muscle contraction, a crucial factor for executing rapid and forceful kicks. Plyometrics primarily focuses on developing speed and explosive power, while resistance training also contributes to muscle strength.

Junior karate athletes at Putera Dojo Tako, located in Simalungun Regency, show less enthusiasm when participating in Resistance exercises in the low concentration category. As a result, they often perform movements incorrectly and their abilities in executing Mawashi Geri are not optimal. This can be attributed to the coach's approach of subjecting the athletes to intense and repetitive training situations, requiring them to translate instructions into action. Not all exercises aimed at enhancing leg muscular power specifically target kicking skill. Concentration refers to the capacity to direct one's attention towards tasks by utilizing both internal and external stimuli (Nusufi, 2016; Randall, Oswald, & Beier, 2014). The internal stimulus in question refers to disruptions in both sensory and mental processes. These problems can be characterized as weariness, anxiety, or other conditions that arise from the athlete's internal state. External stimulation refers to interference originating from sources outside the athlete, such as opposing crowds or officials. This interference can manifest in several forms, including negative or positive reactions like jeers or applause. Similarly, in the realm of sports, when an athlete directs their attention towards a specific sort of training and competition, it leads to the development of habits. These habits, in turn, enhance the athlete's decision-making abilities in both competitive and training environments. Empirical evidence suggests that athletes with diminished focus often choose the plyometric training methodology, according to the prescribed sequence of movements (Ihsan, 2020; Oktavian, Sugiyanto, & Syaifullah, 2022).

The study determined that both resistance training and plyometric training had the potential to enhance the mawasahi geri kicking skill of male junior karate competitors at Dojo Tako, located in the Simalungun district. Nevertheless, when comparing the impact of different training approaches on the improvement of Mawashi Geri's kicking ability, it is evident that weight training yields a more substantial rise than plyometric training. This will serve as a comprehensive guide and calculation for coaches, athletes, parents, and the community. It aims to optimize energy utilization and enhance muscle mass and tissue activity through systematic training. The ultimate goal is to develop a habitual execution of Mawashi Geri kicks by following a structured approach (Hariri & Sadeghi, 2018; Ihsan, 2020; Udara & Chandana, 2021).

In addition, engaging in Mawashi Geri training with resistance can lead to significant boredom. Therefore, it requires intense focus and concentration. Training is a structured and ongoing activity, which necessitates a constant source of motivation and drive to attain the desired objective. It is worth noting that in this study, the male junior athletes of Dojo Tako Simalungun Regency are particularly focused on achieving success, resulting in higher levels of concentration compared to athletes from other Dojos. Meanwhile, plyometric training is characterized by athletes being focused on performing motions, but often overlooking the primary objective of developing leg muscular power (Goodwin & Jeffreys, 2016; Hammami, Gaamouri, Shephard, & Chelly, 2019; Silva, et al., 2015). Coaches, athletes, parents, and the public must be familiar with the merits and disadvantages of each resistance training and plyometric training method, according to these studies. Understanding the strengths and shortcomings of each training strategy allows for a thorough analysis of the specific demands of each individual. In addition, it is important to take into account the individual's baseline condition as these two types of training will have distinct effects on the athlete's anatomy, physiology, and psychology (Inigo Mujika, Halson, Burke, Balagué, & Farrow, 2018; Sin, Ifdil, & Amalianita, 2021).To conduct a more comprehensive analysis of this issue, future researchers should take into account several constraints in this study, including the sample size and the gender distribution of the participants. The objective is to ensure that the obtained findings are practical and beneficial.

Conclusion

Statistical calculations on the collected data indicate that Resistance and plyometric training improve male junior karate competitors' mawasahi geri kicks at Dojo Tako, Simalungun district, according to statistical analysis. Weight training improves Mawashi Geri's kicking more than plyometric training. This guidance and calculation will help coaches, athletes, parents, and the community optimize energy use and muscle mass and tissue activity through methodical training. Mawashi Geri kicks should become habitual through methodical practice. Resistance-based Mawashi Geri training can also be boring. Thus, it demands tremendous concentration. Training is a continuous process that requires motivation and ambition to succeed. In this study, male junior athletes from Dojo Tako Simalungun Regency prioritize achievement, resulting in higher focus than athletes from other dojos. In plyometric training, athletes focus on movements rather than leg muscular power. These findings imply that coaches, players, parents, and the public should understand the pros and cons of resistance and plyometric training. Understanding the pros and cons of each training technique helps analyze each person's needs. The athlete's anatomy, physiology, and psychology will differ between these two training methods, thus it's crucial to consider their starting point.

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