



THE EFFECT OF SAQ (SPEED, AGILITY, QUICKNESS) TRAINING ON HANDBALL PLAYER PERFORMANCE

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Abstract

This study aims to analyze the effect of SAQ (Speed, Agility, Quickness) training on the performance of handball players in the Handball Student Activity Unit (UKM) at STKIP Pasundan Cimahi, particularly in improving speed, agility, and reaction time. The research employed an experimental method with a One Group Pretest-Posttest design, involving 10 participants selected through purposive sampling. The instrument used was the Illinois Agility Test. Data analysis was conducted using the Paired Sample t-Test to compare pretest and posttest results, preceded by a Shapiro-Wilk normality test. If the data were not normally distributed, the Wilcoxon test was used as an alternative. Based on the results, it can be concluded that SAQ (Speed, Agility, Quickness) training had a significant effect on improving the performance of the handball players. This was evidenced by an improvement in the average test scores, from 24.90 seconds in the pretest to 19.764 seconds in the posttest, indicating enhanced performance, as lower scores in the Illinois Agility Test reflect faster times and better ability. Furthermore, the statistical test results showed a significant difference between the two sets of scores ($p = 0.000$). The majority of participants experienced performance improvement after undergoing SAQ training, proving the effectiveness of this training method in developing speed, agility, and quickness in handball players.

Keywords: SAQ training (Speed, Agility, Quickness), handball player performance

INTRODUCTION

Handball is a relatively new sport in Indonesia. While it has been popular since 2007, it has yet to receive widespread public attention, including among physical education teachers. This is evident in the lack of training and the limited availability of handball content in the physical education curriculum (Mukti, 2020). As a team sport with high physical intensity and short durations involving movements such as sprinting, jumping, pushing, and throwing (Dello, 2015), handball demands physical fitness and technical mastery to achieve optimal performance.

Winarni (2014) emphasized that physical fitness plays a crucial role in higher education because it supports the intellectual, emotional, and physical qualities of students

as future leaders. Speed, Agility, and Quickness (SAQ) training aligns with this goal, as it not only develops physical aspects such as speed and agility but also contributes to reducing stress levels and maintaining overall health. Therefore, integrating SAQ training into physical activities at universities can be part of an effort to strengthen the physical education curriculum, which focuses on character building, increasing endurance, and improving mental balance in students.

Handball player performance is influenced by several key factors, such as mastery of basic techniques, excellent physical condition, and psychological stability. Permadi (2021) states that to achieve optimal performance, an athlete must possess solid technical skills, adequate physical fitness, and good mental balance. Therefore, a systematically designed training program tailored to the athlete's needs is crucial to support overall performance improvement.

One training method proven effective in developing speed, agility, and rapid response is Speed, Agility, and Quickness (SAQ) training (Akhmad & Hasibuan, 2020). This training is dynamic and explosive, making it highly suitable for supporting athletes' performance improvement in match conditions that require quick reactions and sudden changes of direction (Hasanah, Adi, & Suwiwa, 2020). However, at STKIP Pasundan Cimahi, handball players' performance improvement remains relatively low. This is due to suboptimal training effectiveness and a lack of variety in training methods. The training used tends to be monotonous and does not fully implement an appropriate scientific approach. However, as Wahyono et al. (2023) noted, successful performance improvement is highly dependent on training intensity and methods that are appropriate to the athlete's needs.

Research by Sinulingga (2023) on plyometric training indicates that methods such as standing jumps have the most significant impact on increasing explosive strength. These findings provide a positive indication that explosive training elements, as implemented in the SAQ method, also have the potential to significantly contribute to improving the performance of handball athletes. Therefore, systematically designed SAQ training can help improve physical abilities such as quick reactions, acceleration, and muscle strength, all of which are crucial for achieving optimal performance in handball.

Meanwhile, a study conducted by Paramitha (2021) on eSports athletes showed that they maintained a relatively high level of physical activity, even though the sporting activity did not involve intense physical movement. This demonstrates that physical fitness still plays a crucial role in supporting performance, even in non-traditional sports. This condition aligns with the demands of handball, which requires physical components such

as speed, agility, and quick reactions. Therefore, the implementation of SAQ training is highly relevant because it directly targets the improvement of motor skills that support game performance, such as sprinting, quick changes of direction, and responding to match dynamics.

In addition to physical and technical factors, psychological and motivational aspects also play a significant role in player performance. Research by Permadi and Fernando (2021) indicates that motivation, self-confidence, and team atmosphere significantly influence the success of an athlete's performance. Therefore, a comprehensive training approach is needed, one of which can be achieved by systematically integrating the SAQ method into the training program.

Performance can be understood as a measure of an individual's ability to effectively complete an activity in accordance with established goals. In sports, performance refers to an athlete's capacity and performance, both individually and within a team context, during a match or competition (Harsono, 2015). Performance assessment is based not only on the quantity of results achieved but also on the quality of those results. Even in education, student performance is often measured through academic evaluations, such as exams and assignment assessments. Active and participatory learning methods have been shown to positively impact student learning outcomes (Freeman et al., 2019). This emphasizes that performance reflects the effectiveness and efficiency of work achievement, which contributes to both individual and organizational success.

In handball, optimal performance is influenced by a combination of physical conditions such as flexibility, strength, speed, and endurance—with technical skills and game strategy integrated (Basiran et al., 2020). Handball is played by two teams of seven players each, and takes place on a standard 40 x 20 meter field, with penalty zones delimited by semicircular lines with a radius of six meters (IHF).

To achieve peak performance, training is a key element that must be implemented systematically and continuously. Training is a planned and repetitive process aimed at improving an athlete's physical fitness, technical skills, playing strategies, and mental readiness (Sukadiyanto, 2002). The primary goal of a training program is to help athletes achieve peak performance over the long term. Training activities include various physical activities aimed at improving the body's physiological functions and developing motor skills according to the needs of a particular sport (Tegartia, 2009). Gradual and consistent training plays a crucial role in honing athletes' physical and psychological abilities, preparing them for competitive competition, and maintaining a fit and healthy body (Bompa, 2000).

One training method that has received considerable attention in developing athlete performance is SAQ training, which is designed to improve three essential motor skills: speed, agility, and quickness. These three aspects are crucial in various sports, especially those that require rapid movements, sudden changes of direction, and instant reactions to stimuli. Speed is the body's ability to cover a certain distance in the shortest possible time, encompassing both individual and entire body movements (Palevi et al., 2019). In handball, running speed and hand movement when throwing the ball significantly impact a player's performance. Agility is the ability to quickly change direction without losing balance, involving coordination, balance, and body control to respond to game situations precisely and efficiently (Yuliawan & Irma, 2023). Quickness is the body's rapid reaction to movement after receiving a stimulus, whether visual, auditory, or tactile, related to the ability to initiate movement instantly and with short accelerations (Yuliawan & Irma, 2023).

SAQ training is performed progressively with increasing load and movement complexity, aiming to optimize the development of basic motor skills. Amar and Wardoyo (2017) stated that this method can help athletes integrate motor skills into the movement patterns of their respective sports. Various studies have shown that SAQ training is effective in improving dynamic balance, reaction time, and physical performance in athletes (Kumar, 2019). Amany Ibrahim and Gehad Nabia even confirmed that SAQ training can significantly reduce agility response times, thereby improving athlete performance in various sports. Furthermore, SAQ also trains complex skills in responding to external stimuli such as deceleration, change of direction, and reacceleration, which are crucial for athletes to adapt quickly and accurately to dynamic match situations (Sharma & Dhapola, 2015).

Research findings from Bujang (2018) indicate that physical components such as leg power, coordination, and reaction speed are crucial in handball. In handball, player performance is determined not only by technical skills but also by physical strength and confidence when making quick decisions, such as throwing, dribbling, or defending against an opponent's attack. Overall, SAQ training provides dual benefits: improving physical abilities and cognitive aspects related to reaction speed and quick decision-making on the field. Therefore, SAQ is considered a highly effective training method for improving athlete performance, particularly in sports that require fast and responsive movements like handball. Seeing this phenomenon and the conditions at STKIP Pasundan Cimahi, this study will examine the effect of SAQ training on improving the performance of handball

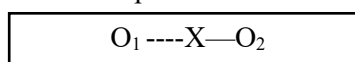
players, in order to provide an alternative, more effective and scientifically based training method to improve athletes' performance in the future.

METHODS

The research used a descriptive quantitative method with an experimental approach. The design used was a One Group Pretest-Posttest Design, meaning one group without a control group was measured before and after the SAQ (Speed, Agility, and Quickness) training treatment.

The design can be described as follows:

Figure 1 One Grup Pretest Post Test Design



Scheme:

- O1 = Pretest
- X = SAQ training treatment
- O2 = Posttest

The study population consisted of 10 members of the STKIP Pasundan Handball Student Activity Unit (UKM Handball), and the sample was drawn using a purposive sampling technique based on participant activity during training. The research instrument, the Illinois Agility Test, was used to measure player performance before and after training, with data recorded on a special test form.

The research procedure included a preparation phase, including determining the focus, research variables, tools and schedule, as well as coordination with the coach and sample selection. The implementation phase lasted six weeks, with SAQ training twice per week and performance measured using an on-field agility test according to a predetermined schedule. After training, a post-implementation phase was conducted, which involved performance testing using the same test as in the initial phase.

The pretest and posttest data were then analyzed using a paired sample t-test to determine whether there were significant differences in player performance before and after SAQ training. Prior to the t-test analysis, data normality was tested using the Shapiro-Wilk test. If the data were normally distributed, the analysis proceeded with a t-test; otherwise, the non-parametric Wilcoxon Signed Rank Test was used. The decision of the analysis results is based on the p-value with a significance level of 0.05; if the p-value is less than 0.05, SAQ training is considered to have a significant effect on improving handball player performance, and if it is more than or equal to 0.05, there is no significant effect.

RESULT AND DISCUSSION

This study was conducted to determine the effect of SAQ (speed, agility, quickness) training on the performance of handball players. This study was conducted from April 30 to May 14, 2025, and had 10 respondents. The following table shows a general overview of the initial abilities of the players before being given treatment using SAQ (speed, agility, quickness) training. Based on the results of descriptive statistics on the pre-test given to 10 handball players, the average value obtained was 24.90 with a median value of 24.200 and a mode of 22.87. The following is the frequency distribution of the pre-test values:

Table 1. Pre-test Interval Class of Handball Player Performance Level

Category	Range Score	Frequency	Percentage (%)
High	< 23,01	1	10%
Medium	23,01 – 26,81	7	70%
Low	> 26,81	2	20%
Total	—	10	100%

Based on the pre-test score categorization table and diagram, it was found that of the 10 handball players in the study sample, 1 (10%) fell into the high category with a score below 23.01. The majority of participants, 7 (70%), fell into the medium category with scores ranging from 23.01 to 26.81. Meanwhile, 2 (20%) fell into the low category with scores above 26.81. This distribution indicates that the majority of players had moderate initial performance before being given SAQ (Speed, Agility, Quickness) training. Only a few players had very good or very low initial performance, so the SAQ training program is expected to be more effective in improving the performance of the majority of players in the medium category.

After the SAQ (speed, agility, quickness) training, the handball players' performance was tested. Based on the descriptive statistics results of the post-test conducted on 10 handball players, the average (mean) was 19.76, the median was 19.320, and the mode was 18.77. The descriptive results of the test results are as follows:

Table 2. Post Test Interval Class of Handball Player Performance Level

Category	Range Score	Frequency	Percentage (%)
High	< 18,67	2	20%
Medium	18,67 – 20,86	8	80%
Low	> 20,86	0	100%

Based on the results of the post-test score grouping, of the 10 handball players sampled in the study, two (20%) were in the high category with scores below 18.67. The majority of players, eight (80%), were in the medium category with scores ranging from

18.67 to 20.86. No participants fell into the low category (scores above 20.86). These results indicate that after being given SAQ (Speed, Agility, Quickness) training, there were no longer any low-performing players. The majority of participants demonstrated moderate performance, with a small number reaching the high category. This distribution reflects that SAQ training has a positive impact on improving and equalizing player performance, while simultaneously reducing the gap in physical ability among them.

Prerequisite testing (or assumption testing) is crucial in statistical analysis because it ensures that the data being analyzed meets certain assumptions that underlie the validity of the statistical method used. Normality testing uses the Shapiro-Wilk test, as shown in the following table:

Table 3. Normality Test

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre Test	.239	10	.110	.884	10	.144
Post test	.241	10	.104	.860	10	.076

a. Lilliefors Significance Correction

Based on the results of the Shapiro-Wilk normality test used because the number of samples is less than 30 ($n = 10$), the significance value (Sig.) obtained for the pre-test data is 0.144 and for the post-test data is 0.076. Both significance values are greater than 0.05, so it can be concluded that the pre-test and post-test data are normally distributed. In this test, the hypothesis that the variance of the variables is the same will be tested. To accept or reject the hypothesis by comparing the significance value of more than 0.05. The results of the homogeneity test can be seen in the table below:

Table 4. Homogeneity Test

Test of Homogeneity of Variances					
		Levene			
		Statistic	df1	df2	Sig.
Pre test	Based on Mean	4.672	1	18	.064
	Based on Median	1.718	1	18	.206
	Based on Median and with adjusted df	1.718	1	14.957	.210
	Based on trimmed mean	4.310	1	18	.072

Based on the results of the homogeneity test using the Levene Test, the significance value obtained based on the mean was 0.064, based on the median was 0.206, based on the median with adjusted df was 0.210, and based on the trimmed mean was 0.072. All significance values were greater than 0.05, which means there was no significant difference in variance between the groups, or in other words, the data had homogeneous variance. To determine whether there was an effect of SAQ (speed, agility, quickness) training on the

performance of handball players, a t-test was conducted. The t-test can be seen in the following table:

Table 5. Hypothesis Test

Paired Samples Test	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1 Pre Test - Post test	5.14300	2.06624	.65340	3.66490	6.62110	7.871	9	.000	

Based on the results of the paired t-test, the average difference (mean difference) between the pre-test and post-test was 5.143 with a standard deviation of 2.066 and a standard error of 0.653. The calculated t-value was 7.871 with degrees of freedom (df) = 9, and a significance value (Sig. 2-tailed) of 0.000. Because the significance value is smaller than 0.05 ($p < 0.05$), it can be concluded that there is a significant difference between the pre-test and post-test values. This means that there is a significant influence of SAQ (Speed, Agility, Quickness) training on improving the performance of handball players. The higher average pre-test value compared to the post-test indicates that SAQ training successfully increases the speed and agility of players, which in certain measurements results in more efficient time or better performance values..

This study aimed to determine the effect of SAQ (speed, agility, quickness) training on handball player performance. Before SAQ training, handball players' performance was in the moderate category (70%), with an average pretest score of 16.92. After training, the average posttest score increased to 21.41, with the majority of participants remaining in the moderate category (90%) and the remainder in the high category (10%). No participants fell into the low category on the posttest, indicating an improvement in player performance after SAQ training.

A paired t-test revealed a significant difference between pretest and posttest scores ($t = -8.059$; $p = 0.000 < 0.05$). This indicates that SAQ training has a positive and significant effect on improving handball player performance. The findings in this study regarding the significant effect of SAQ (Speed, Agility, Quickness) training on handball player performance are supported by several similar studies. Despite the different sporting contexts, the essence of the physical performance improvements studied remains similar, particularly in terms of speed, agility, and quick reactions, which are core components of handball performance.

Among these is research by Yuliawan & Septriasari (2023). Their study found that SAQ training significantly improved 60-meter sprint speed. The statistical test results

showed a p-value <0.05 and a high t-test, indicating a significant improvement in speed. Although conducted on sprinters, these results demonstrate that SAQ training is effective in improving basic speed skills, which are also important elements in handball, such as fast breaks and rapid positional changes.

Research by Amar, Subarkah, & Wardoyo (2015) also supports the researchers' findings. This study focused on female badminton doubles athletes at PB Djarum and showed that SAQ training significantly improved players' agility. The t-test results showed a significant difference before and after treatment. This increased agility contributes greatly in sports such as badminton, and is also relevant in handball, especially when making sudden changes of direction to outwit an opponent or close down space in attack..

This research is further supported by research by Fauzan et al. (2023). In a study conducted on 10-year-old children practicing futsal, they found that SAQ training significantly increased dribbling speed. This was demonstrated by a significance value of 0.01 in the 20-meter sprint test with a ball and 0.000 in the slalom test with the ball, both of which were below the 0.05 significance level. These findings indicate that SAQ training is also effective in improving coordination, speed, and ball control, aspects that are also crucial in handball, where players must be able to dribble and react quickly to game situations.

Furthermore, research by Lestari et al. (2021), involving athletes from the Widiagility Club, found that SAQ training significantly increased zigzag running speed, a key indicator of agility. The t-test results showed a calculated t-value of 214.21, significantly exceeding the t-table value of 2.04, indicating a very strong effect of SAQ training on agility. Zigzag speed is a fundamental movement in handball, especially when performing defensive or offensive maneuvers in one-on-one situations.

Findings from Badaru's (2022) research reinforce that muscle strength (particularly arm muscles) plays a crucial role in sports involving throwing, such as handball. In handball, players often make fast and powerful throws to score points or defend against attacks. SAQ (Speed, Agility, Quickness) training encompasses elements of power and quick reactions, which can involve exercises to improve arm and leg strength and coordination between body parts. Although SAQ is better known in the context of increasing speed and agility, the strength component of SAQ training can have a direct impact on the quality and power of handball throws, as evidenced by the push-up exercise in the petanque study. This is in line with Pelana's (2019) research, which showed that upper body strength and mobility contribute significantly to shooting performance. These findings align with the focus of SAQ (Speed, Agility, Quickness) training, which

emphasizes improving speed, agility, and explosive strength. In the context of handball, these components are crucial for supporting player performance during rapid movements, changes of direction, and shots on goal. Therefore, SAQ training has the potential to positively impact handball player performance by improving similar physical abilities.

Based on research by Sobarna (2022), which discusses improving sports performance from a scientific and technological perspective at the Cimahi City Sports Committee (KONI), improving sports performance must be based on scientific studies and the application of relevant and cutting-edge technology. This aligns with the importance of implementing science-based training methods, such as SAQ (Speed, Agility, Quickness) training, which aims to improve athletes' speed, agility, and dexterity. Therefore, research on the effect of SAQ training on handball player performance represents a direct implementation of scientific and technological concepts in an effort to improve sports performance, particularly within the Cimahi City Sports Committee (KONI). Collaboration between academics, coaches, and policymakers, as described in the study, significantly supports the successful implementation of this training method in improving athlete performance.

Research conducted by Supriadi (2023) on the physical fitness of futsal athletes during match preparation in Cimahi showed that speed is a crucial aspect that requires attention in training programs. The results of the study found that the average physical fitness level of male athletes was 73% (sufficient), while female athletes reached 63% (poor). Factors such as genetics, training, age, and daily activity influence an athlete's physical fitness. Therefore, a structured and systematic fitness training program is essential to optimize the dominant aspects of physical fitness in preparation for competition. In line with these findings, research on the effect of SAQ (Speed, Agility, and Quickness) training on handball player performance is highly relevant. SAQ training, which focuses on improving speed, agility, and dexterity, can be an effective method for improving handball athlete performance, particularly in preparation for competition. Therefore, the application of SAQ training represents a practical implementation of the concept of improving physical fitness, which has proven important in the fitness research of futsal athletes in Cimahi.

CONCLUSION

Based on the research results, it can be concluded that SAQ (Speed, Agility, Quickness) training has a significant effect on improving the performance of handball players. This is indicated by an increase in the average test results from the pretest of 24.90 to 19.764 seconds in the posttest, which indicates an increase in performance, considering

that lower scores in the Illinois Agility Test indicate faster times and better abilities, and the results of statistical tests that show a significant difference between the two results ($p = 0.000$). The majority of participants experienced an increase in performance after participating in SAQ training, which proves the effectiveness of this training in developing the speed, agility, and dexterity of handball players.

REFERENCES

- Akhmad, H., & Hasibuan, A. (2020). *Pengaruh latihan SAQ terhadap peningkatan kelincahan dan kecepatan atlet bola basket*. *Jurnal Ilmu Keolahragaan*, 9(2), 112–119.
- Amar, M., & Wardoyo, H. (2017). *Latihan SAQ dalam meningkatkan performa atletik*. *Jurnal Pelatihan Olahraga*, 4(1), 55–62.
- Badaru, B., Rachmat Kasmad, M., Juhanis, J., & Anwar, N. I. (2021). Effect of accuracy and muscle strength training on the result of shooting throws in petanque. *Jurnal Maenpo: Jurnal Pendidikan Jasmani Kesehatan Dan Rekreasi*, 11(1), 56.
- Basiran, A., Hidayat, M. N., & Sugiarto, S. (2020). *Analisis kebutuhan kondisi fisik pemain bola tangan*. *Jurnal Olahraga Prestasi*, 16(1), 25–33.
- Bujang, M., Maya, N. D. T., & Velyan, M. Y. (2018). *Effect of leg power, arm power, eyes and foot coordination and self confidence on back attack smash in volleyball*. In 2nd International Conference on Sports Sciences and Health (2nd ICSSH).
- Supriadi, D., Friskawati, G. F., & Karisman, V. A. (2023). Physical fitness of futsal athletes in competition preparation. *International Journal of Human Movement and Sports Sciences*, 11(1), 71-76.
- Bompa, T. O. (2000). *Total training for young champions*. Champaign, IL: Human Kinetics.
- Dello, E. J. (2015). *Analisis kebutuhan fisik dalam permainan bola tangan*. *Jurnal Pendidikan Jasmani*, 6(2), 40–46.
- Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2019). *Active learning increases student performance in science, engineering, and mathematics*. *Proceedings of the National Academy of Sciences*, 111(23), 8410–8415.
- Harsono. (2015). *Coaching dan aspek-aspek psikologis dalam olahraga*. Jakarta: PT RajaGrafindo Persada.
- Hasanah, U., Adi, I. K., & Suwiwa, I. M. (2020). *Pengaruh metode SAQ terhadap peningkatan kelincahan dan kecepatan atlet futsal*. *Jurnal Ilmu Keolahragaan*

- Undiksha, 8(2), 93–100. International Handball Federation (IHF). *Official rules of the game of handball*. <https://www.ihf.info>
- Kumar, R. (2019). *Effect of SAQ training on agility and performance of athletes*. International Journal of Physical Education, Sports and Health, 6(3), 58–61.
- Mukti, M. A. (2020). *Pengenalan olahraga bola tangan di sekolah menengah pertama*. Jurnal Pendidikan Jasmani Indonesia, 4(1), 12–18.
- Palevi, A. D., Yuda, T., & Gunawan, A. (2019). *Latihan SAQ untuk meningkatkan kecepatan reaksi dan daya tahan atlet*. Jurnal Sport Science, 3(1), 45–50.
- Paramitha, S. T., Hasan, M. F., Iلسya, M. N. F., Anggraeni, L., & Ramadhan, M. G. (2021). Level of physical activity of Indonesian esport athletes in the piala Presiden esport 2019. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*, 7(1), 71-83.
- Pelana, R., Irfansyah, A. R., & Setiakarnawijaya, Y. (2019). Study of Correlation Between Power of The Arm Muscle and Rom (Range of Motion) of Shoulder With The Results of 9 Meters Distance Shooting in Petanque Athlete Faculty of Sport Science State University of Jakarta, Indonesia. *European Journal of Physical Education and Sport Science*.
- Permadi, R. (2021). *Faktor-faktor yang mempengaruhi performa atlet*. Jurnal Ilmiah Pendidikan Jasmani, 9(2), 34–42.
- Permadi, R., & Fernando, R. (2021). *Pengaruh motivasi dan suasana tim terhadap performa atlet bola tangan*. Jurnal Keolahragaan dan Kesehatan, 13(1), 21–30.
- Sharma, M., & Dhapola, M. (2015). *SAQ training: An approach to improve athletic performance*. International Journal of Applied Research, 1(12), 830–833.
- Sinulingga, A., Pasaribu, A. M. N., Bangun, S. Y., Ningrum, D. T. M., & Mahyudi, Y. V. (2023). Plyometric exercise and speed on the power of sabit kick in pencak silat. *International Journal of Human Movement and Sports Sciences*, 11(3), 591-597.
- Sobarna, A., Rizal, R. M., Hambali, S., Asmara, H., & Sunarsi, D. (2022). Peningkatan Prestasi Olahraga Ditinjau Dari Konsep Ilmiah Dan Teknologi Di Koni Kota Cimahi. *Jurnal Penelitian dan Pengabdian Kepada Masyarakat UNSIQ*, 9(2), 173-176.
- Sukadiyanto. (2002). *Pengantar teori dan metodologi melatih*. Yogyakarta: Andi Offset.
- Tegartia, N. (2009). *Dasar-dasar latihan fisik untuk prestasi maksimal*. Jakarta: Gramedia Widiasarana Indonesia.
- Wahyono, T., Hidayat, R., & Yuliani, R. (2023). *Efektivitas metode latihan dalam meningkatkan performa atlet*. Jurnal Kepelatihan Olahraga, 11(1), 71–79.

Winarni, S. (2004). Perlukah Pendidikan Jasmani diPerguruan Tinggi?(Sebuah Strategi Adopsi & Kesetiaan Beraktivitas Jasmani dan Olahraga). *Jurnal Pendidikan Jasmani Indonesia*, 1(1).

Yuliawan, R., & Irma, I. (2023). *Peran latihan SAQ dalam meningkatkan agility dan quickness pada olahraga beregu*. *Jurnal Keolahragaan Nusantara*, 5(2), 122–129.