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PHYSICAL PERFORMANCE INDICATORS OF FEMALE PENCAK SILAT ATHLETES

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Abstract
Condition is a major determinant in achieving success in the sport of pencak silat, which demands the integration of complex energetic and biomotor abilities. This study aims to identify and analyze the physical performance profiles of female pencak silat athletes under the auspices of the Indonesian Pencak Silat Association (IPSI) in Kutai Kartanegara Regency. Using a quantitative descriptive design, this study involved 21 female athletes selected through a descriptive quantitative technique. purposive sampling. The measurement instruments include the VO_2Max test for aerobic capacity, sit-ups And elbow plank for abdominal muscle endurance and stability core, V Sit and Reach for flexibility, as well as push-ups for arm muscle endurance. Data analysis was conducted using descriptive statistical techniques in the form of frequency distribution and percentages. The results showed significant variation between fitness components. In terms of aerobic capacity, the majority of athletes (66.66%) were in the very low category. Conversely, performance in the dynamic abdominal muscle endurance (sit-ups) and flexibility components showed positive results, with 80.94% and 76.18% of athletes, respectively, in the good to very good category. Arm muscle strength (push-ups) was also considered adequate, with 66.66% of athletes achieving at least the good category. However, in terms of stability core (elbow plank), the majority of athletes (52.38%) are still in the moderate category. It was concluded that although the athletes' mechanical components and flexibility have developed well, cardiorespiratory capacity (VO_2Max) and core muscle static endurance remain fundamental weaknesses. This finding implies the need for a reorientation of exercise programs based on sports science which focuses on improving the aerobic energy system and stability core without neglecting the maintenance of other physical components to achieve optimal competition performance.
Keywords: *Physical Performance; Pencak Silat VO_2Max; Sport Science; Kutai Kartanegara.*

INTRODUCTION

Pencak silat is a traditional Indonesian martial art that has developed into a competitive sport and is competed in at both the national and international levels (Saputro & Siswantoyo, 2018) . In the context of competitive sports, pencak silat requires athletes to possess complex and specific physical abilities in accordance with the characteristics of the competition. (Nugroho et al., 2025) . Pencak silat athletes are required to be able to perform explosive, fast, and precise movements, as well as maintain optimal performance throughout the duration of the match. (et al., 2024) . Therefore, physical condition is one of the main factors that determines

the success of athletes in achieving achievements. (Yang et al., 2024) . Physical performance in pencak silat encompasses various components of physical fitness, such as strength, explosive power, speed, endurance, agility, balance, and coordination (Hambali et al., 2020) . These components work in an integrated manner to support the implementation of techniques and tactics in dynamic match situations. Attacking, defending, and rapid movement transitions demand adequate physical capacity, both from the anaerobic and aerobic energy systems (Ruddock et al., 2021) . Thus, the physical performance of pencak silat athletes is multidimensional and needs to be evaluated comprehensively through measurable indicators.

Along with the development of sports science, athlete development is required to adopt a sports science- based approach . This approach emphasizes the importance of using objective data in the planning, implementation, and evaluation of training programs (Kraemer & Ratamess, 2004) . Performance monitoring and evaluation systems based on tests and measurements are fundamental to modern physical conditioning development (Schoenfeld et al., 2021) . Measuring athletes' physical performance indicators is an important part of increasing the effectiveness of training and minimizing the risk of injury. (Rebelo et al., 2023) . Strength, explosive power, endurance, and agility are the main determinants of performance in martial arts. (Suchomel et al., 2016) and (GEVEN, 2013) . Specifically, the physiological characteristics and physical needs of pencak silat athletes require good anaerobic capacity, reaction speed, and leg power (Bustamante-Sánchez et al., 2026) . However, in practice, pencak silat training in various regions still faces limited empirical data regarding athletes' physical condition profiles. Several national studies have shown that the physical condition profiles of pencak silat athletes in the regions are still diverse and have not been systematically documented (Wahid et al., 2024) . This results in training programs often being developed based on the subjective experiences of coaches without the support of comprehensive quantitative data.

Kutai Kartanegara Regency is one of the regions with potential for developing pencak silat. Despite ongoing performance development efforts, there has been no

scientific study specifically mapping the physical performance indicators of pencak silat athletes in the region. However, according to Periodization: Theory and Methodology of Training (Roberts et al., 2023) , effective training planning must be based on the results of an objective and measurable assessment of the athlete's physical condition. The absence of standardized data on athletes' physical performance has the potential to hinder the achievement of optimal performance. (Exel & Dabnichki, 2024) . National studies also confirm that evaluating the physical condition of pencak silat athletes is the basis for developing specific training programs for the sport (Romadhona & Candra, 2024) . Without a comprehensive understanding of an athlete's physical profile, coaches will have difficulty prioritizing physical components that need to be developed and continuously monitoring progress.

Based on these issues, research on the Physical Performance Indicators of Pencak Silat Athletes in Kutai Kartanegara is highly urgent. This research is crucial for providing empirical data regarding the physical performance characteristics of pencak silat athletes at the regional level. The results are expected to serve as a basis for developing more targeted and specific physical training programs tailored to the demands of competitions. (Weakley et al., nd) . The primary objective of this study is to identify and analyze physical performance indicators of pencak silat athletes in Kutai Kartanegara Regency. Specifically, this study aims to describe the athletes' physical performance profiles based on physical fitness components relevant to the characteristics of pencak silat. Through identifying these indicators, it is hoped that a comprehensive picture of the athletes' physical condition can be obtained as a basis for decision-making in performance development. This research is expected to contribute to both theoretical and practical aspects. Theoretically, this research enriches sports science studies, particularly regarding the physical performance of pencak silat athletes, a traditional Indonesian martial art. Practically, the research findings can be used by coaches and trainers as a basis for developing more effective, measurable, and data-driven physical training programs.

With the availability of information on the physical performance indicators of pencak silat athletes in Kutai Kartanegara, it is hoped that the athlete

development process can be carried out more systematically and effectively. This research is also expected to support the implementation of a sports science approach in regional sports development, thereby contributing to the sustainable improvement of pencak silat achievements at the regional and national levels.

METHOD

This study employed a quantitative descriptive design. This design was chosen because it aligns with the research objective, which is to systematically and measurably describe the performance indicators of pencak silat athletes (Scharrer & Ramasubramanian, 2021) . Quantitative descriptive research aims to provide a factual and accurate picture of a particular phenomenon through statistically analyzed numerical data (Creswell & Crecwell, 2014) . A quantitative approach allows researchers to obtain objective data that can be processed using descriptive statistics, resulting in measurable and scientifically accountable information. (Scharrer & Ramasubramanian, 2021) .

The research was conducted at the Indonesian Pencak Silat Association (IPSI) in Kutai Kartanegara Regency. This location was chosen because it is the official training center for pencak silat athletes in the region. The study was conducted in December, considering that athletes were in their regular training period, facilitating data collection and minimizing disruption to the training program.

The study population was all female pencak silat athletes in Kutai Kartanegara Regency who actively participated in training activities at IPSI. The sample was determined based on inclusion criteria, namely female athletes who were officially registered, actively training, and willing to be respondents (Mathisen et al., 2022) . The technique used was purposive sampling, which is the deliberate selection of samples based on certain characteristics relevant to the research objectives (Sugiyono, n.d.) . This technique was chosen because the researcher needed respondents with specific criteria so that the data obtained truly represent the performance profile of female pencak silat athletes.

Data collection was conducted using physical condition test instruments commonly used in martial arts, including flexibility tests, abdominal muscle strength, hand muscle strength, agility, and endurance (Hernandez-Martinez et al.,

2025) . The use of physical tests as indicators of athlete performance is based on the principle that strength, endurance, and agility are key components in achieving sports performance (Triplett et al., 2015) . Furthermore, in the context of pencak silat, several national studies have shown that physical condition components such as VO_2max, leg power, and agility are important determinants of athlete performance (Wahid et al., 2024) . The measurement instruments were developed based on standard physical condition tests commonly used in pencak silat coaching and sports research. (Wardoyo & Ali, 2022) . The measurement process was carried out using the same procedure for each respondent to maintain the validity and reliability of the data.

The collected data were analyzed using descriptive statistical techniques in the form of average values, percentages, and frequency distributions (Drury et al., 2023) . Descriptive statistics aim to describe the characteristics of the data without making broad generalizations (Field, 2013) . The results of the analysis were then interpreted to provide an actual picture of the performance indicators of female pencak silat athletes in Kutai Kartanegara Regency. Thus, this study is expected to provide data-based information that can be used by IPSI coaches and administrators in developing more targeted physical training programs based on scientific evaluation.

RESULT AND DISCUSSION

The results of each test will be analyzed based on the processing performed. A distribution of scores for each test will be obtained. Below are some test results for each component of physical condition for the female pencak silat athletes from Kutai Kartanegara.

Test Results for Female Pencak Silat Athletes from IPSI Kukar

The data presented shows the distribution of aerobic capacity levels (VO_2Max) in the 10–19 year age group with a sample size of 21 people. The measurement results show that the majority of respondents (66.66%) are in the “very low” category (<35.0 ml/kg/min), while 23.80% are in the “low” category (35.0–39.9 ml/kg/min). Only a small portion, namely 9.52%, reached the

"moderate" category (40.5–45.1 ml/kg/min). There were no respondents who fell into the "good", "very good", or "superior" categories .

Table 1 VO2Max Level Test of Female Pencak Silat Athletes of IPSI Kukar

VO2Max Range 10-19 years old	Criteria	Frequency	Presentation
<35.0	Very low	14	66.66%
35.0-39.9	Low	5	23.80%
40.5-45.1	Currently	2	9.52%
45.2-50.9	Good	0	0%
51.0-55.9	Very good	0	0%
Amount		21	100%

the Abdominal Muscle Endurance Test of IPSI Kukar's Female Pencak Silat Athletes

Sit-up test data from 21 female pencak silat athletes from the Kutai Kartanegara Indonesian Martial Arts Association (IPSI) showed a relatively good distribution of abdominal muscle endurance. Nine athletes (42.85%) were in the very good category (>41 repetitions), indicating that nearly half of the sample had optimal abdominal muscle capacity to support body stability and performance in competitions. Furthermore, eight athletes (38.09%) were in the good category (30–40 repetitions), indicating that the majority of athletes (80.94%) had adequate to superior abdominal muscle endurance. On the other hand, three athletes (14.28%) were in the moderate category (21–29 repetitions) and one athlete (4.76%) was in the poor category (10–20 repetitions). No athletes were in the very poor category (<10 repetitions), thus it can be concluded that all samples had sufficient basic abilities.

Table 2 Abdominal Muscle Endurance Test of Female Pencak Silat Athletes of IPSI Kukar

Sit Up Norms	Criteria	Frequency	Presentation
>41	Very good	9	42.85%
30-40	Good	8	38.09%
21-29	Currently	3	14.28%
10-20	Not enough	1	4.76%
<10	Very less	0	0%
Amount		21	

Test Results for IPSI Female Pencak Silat Athletes

The V Sit and Reach test data from 21 female pencak silat athletes from the Kutai Kartanegara IPSI provides an overview of the level of body flexibility, particularly leg and waist muscle flexibility. Five athletes (23.80%) were in the very good category (>29 cm), indicating optimal flexibility to support kicking movements and defensive techniques. The majority of athletes, namely 11 (52.38%), were in the good category (23–28 cm), so that more than half of the sample had adequate flexibility according to the demands of pencak silat. However, there were two athletes (9.52%) in the moderate category (18–22 cm) and three athletes (14.28%) in the poor category (12–17 cm). This condition indicates that there are groups of athletes who still need to improve their flexibility to perform explosive movements with optimal reach. No athletes were in the very poor category (<11 cm), so that all samples had sufficient basic flexibility capabilities.

Table 3 Flexibility Test Results of IPSI Female Pencak Silat Athletes

Norma V Sit and Reach	Criteria	Frequency	Presentation
>29	Very good	5	23.80%
23-28	Good	11	52.38%
18-22	Currently	2	9.52%
12-17	Not enough	3	14.28%
<11	Very less	0	0%
Amount		21	100%

the Abdominal Muscle Endurance Test of IPSI Kukar's Female Pencak Silat Athletes

Elbow plank test data from 21 female pencak silat athletes from the Kutai Kartanegara Indonesian Martial Arts Association (IPSI) provides an overview of core endurance, a key component of physical fitness. Eight athletes (38.09%) were in the good category (120–240 seconds), while the majority, 11 athletes (52.38%), were in the moderate category (60–120 seconds). This indicates that most athletes have the ability to maintain abdominal muscle contractions for a sufficient duration, but have not yet reached optimal levels. Furthermore, two athletes (9.52%) were in the poor category (30–60 seconds), indicating significant weaknesses in core stability that can affect balance and movement effectiveness during competition. No athletes were in the excellent (>240 seconds) or superior (>360 seconds)

categories, thus concluding that overall abdominal muscle endurance still needs improvement.

Table 4 Results of the Abdominal Muscle Endurance Test of IPSI Kukar Female Pencak Silat Athletes

Norma Elbow Plank (second)	Criteria	Frequency	Presentation
>360	Superior	0	0
240 – 360	Very good	0	0
120 – 240	Good	8	38.09%
60 – 120	Currently	11	52.38%
30-60	Not enough	2	9.52%
15-30	Very less	0	0
<15	Very good	0	0
Amount		21	100%

the Arm Muscle Endurance Test of IPSI's Female Pencak Silat Athletes

Push-up test data from 21 female pencak silat athletes from the Kutai Kartanegara Indonesian Pencak Silat Association (IPSI) provides an overview of arm muscle strength as an important component of physical fitness in pencak silat. Eight athletes (38.09%) were in the excellent category (>35 repetitions), indicating optimal arm muscle strength capacity to support punching, blocking, and defense techniques. Furthermore, six athletes (28.57%) were in the good category (25–35 repetitions), so the majority of athletes (66.66%) had adequate to superior arm muscle strength. On the other hand, there were 3 athletes (14.28%) in the moderate category (15–24 repetitions) and 4 athletes (16.66%) in the poor category (6–14 repetitions). No athletes were in the very poor category (<5 repetitions), so it can be concluded that all participants had sufficient basic arm muscle strength capabilities.

Table 5 Results of the Arm Muscle Endurance Test of IPSI Female Pencak Silat Athletes

Push Up Norms	Criteria	Frequency	Presentation
>35	Very good	8	38.09%
25-35	Good	6	28.57%
15-24	Currently	3	14.28%
6-14	Not enough	4	16.66%
<5	Very less	0	0
Amount		21	

Discussion

Research on the physical condition of female pencak silat athletes from the Kutai Kartanegara Indonesian Martial Arts Association (IPSI) provides a comprehensive overview of the physical fitness profile of the study sample. Based on the results of the VO_2Max test, the majority of athletes were in the very low (66.66%) and low (23.80%) categories, indicating limited aerobic capacity. Aerobic capacity is a crucial component in martial arts because it plays a role in maintaining work intensity during matches (William J. Kraemer & Nicholas A. Ratamess, 2004). In the context of pencak silat, cardiorespiratory endurance contributes to an athlete's ability to maintain performance during intermittent match rounds (Padulo et al., 2019). National research also shows that VO_2max in pencak silat athletes is an important indicator of competition readiness (Wahid et al., 2023).

In the abdominal muscle endurance component through the sit-up test, most athletes showed good to excellent results (80.94%), indicating adequate dynamic abdominal muscle capacity. However, the results of the elbow plank test showed that the majority of athletes were in the moderate category (52.38%), which indicates weakness in core endurance . Core muscle stability is very important in maintaining balance, force transfer, and the effectiveness of attack and defense techniques (Triplett et al., 2015) .

A national study by Romadhona & Candra, (2024) also emphasized the importance of core muscle strength and endurance in supporting the technical performance of pencak silat athletes. Flexibility tests using the V Sit and Reach method showed that the majority of athletes were in the good (52.38%) and very good (23.80%) categories. Good flexibility plays a role in increasing kicking range and reducing the risk of muscle and joint injuries (Behm et al., 2015) . National research by Liani & Hariyanto, (2024) also found that flexibility is one of the dominant components in supporting the effectiveness of kicking techniques of pencak silat athletes (Syaifullah & Lingsir Maghribi, 2023) .

Arm muscle strength tests through push-ups showed a relatively good distribution, with 38.09% of athletes in the very good category and 28.57% in the good category. Arm muscle strength is very important in supporting punching and

defense techniques in pencak silat (Triplett et al., 2015) These results are in line with research by Wardoyo and Ali (2021) which stated that arm and shoulder muscle strength contributed to the effectiveness of attack techniques in pencak silat athletes.

Overall, this study shows that arm muscle strength, flexibility, and dynamic abdominal muscle endurance are relatively good, while VO_2max and core endurance still need improvement. These findings align with the theory of training periodization, which emphasizes the balanced development of physical components to achieve optimal performance (Bompa & Carrera, 2005) . Therefore, a structured training program, based on physical condition evaluation, and designed periodically is needed to achieve performance improvements systematically and sustainably.

CONCLUSION

Based on the research results, it can be concluded that the components of arm muscle strength, flexibility, and dynamic abdominal muscle endurance have developed well, while VO2Max and core endurance remain weak. These findings align with physical fitness theory, which emphasizes the importance of balanced development of physical components. An imbalance between fitness components can hinder an athlete's overall performance, as pencak silat demands the integration of strength, endurance, flexibility, and body coordination. The practical implication of this research is the need to design more targeted training programs and appropriate periodization to improve weak components, particularly VO2Max and core endurance. Aerobic exercises such as interval running, fartlek, and circuit training can be used to improve cardiorespiratory capacity, while stabilization exercises such as plank variations, Pilates, and core strengthening can be used to improve core endurance. Furthermore, maintaining existing components is still necessary to prevent decline in performance. With balanced physical fitness development, it is hoped that the performance of IPSI Kutai Kartanegara's female pencak silat athletes will be more optimal in competitions. This research confirms that physical fitness is the primary foundation of pencak silat, and improving weak components will significantly contribute to sporting achievements.

REFERENCES

Behm, D.G., Blazevich, A.J., Kay, A.D., & McHugh, M. (2015). Acute effects of muscle stretching on physical performance, range of motion, and injury incidence in healthy active individuals: A systematic review. *Applied Physiology, Nutrition and Metabolism* , *41* (1), 1 – 11. https://doi.org/10.1139/apnm-2015-0235

Bompa, T.O., & Carrera, M.C. (2005). *Periodization Training For Sports* . http://books.google.com/books?id=RUowTe6UvbcC&pgis=1

Bustamante-S á nchez, Á ., de la Torre-G ó mez, S., & Clemente-Su á rez, V. J. (2026). Differences in the psychophysiological response between normal weight and overweight young recreational athletes in strength training. *Journal of Human Sport and Exercise* , *21* (1), 1 – 10. https://doi.org/10.55860/d6921037

Creswell, J. W., & Crecwell, J. D. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* .

Drury, A., Pape, E., Dowling, M., Miguel, S., Fern á ndez-Ortega, P., Papadopoulou, C., & Kotronoulas, G. (2023). How to Write a Comprehensive and Informative Research Abstract. *Seminars in Oncology Nursing* , *39* (2), 0 – 4. https://doi.org/10.1016/j.soncn.2023.151395

Exel, J., & Dabnichki, P. (2024). Precision Sports Science: What Is Next for Data Analytics for Athlete Performance and Well-Being Optimization? *Applied Sciences (Switzerland)* , *14* (8). https://doi.org/10.3390/app14083361

Field, A. (2013). *Discovering Statistics Using IBM SPSS Statistics* . SAGE Publications.

GEVEN, CYF (2013). The Online Journal of Recreation and Sport. *The Online Journal of Recreation and Sport* , *6* (2), 32 – 39.

Hambali, S., Sundara, C., & Meirizal, Y. (2020). Physical Condition of Pencak Silat Athletes of the West Java Pplp. *Multilateral Journal of Physical Education and Sports* , *19* (1), 74 – 82. https://doi.org/10.20527/multilateral.v19i1.8217

Hernandez-Martinez, J., Cid-Calfucura, I., Guzm á n-Mu ñ oz, E., Herrera-Valenzuela, T., Delgado-Floody, P., Nu ñ ez-Espinosa, C., Branco, BM, Mota, J., Nobari, H., Perez-Carcamo, J., V á squez-Carrasco, E., & Vald é s-Badilla, P. (2025). Effects of olympic combat sports on physical fitness in non-athlete students: a systematic review with meta-analysis. *Frontiers in Physiology* , *16* (July). https://doi.org/10.3389/fphys.2025.1620621

Kraemer, W. J., & Ratamess, N. A. (2004). Fundamentals of Resistance Training: Progression and Exercise Prescription. *Medicine and Science in Sports and Exercise* , *36* (4), 674 – 688. https://doi.org/10.1249/01.MSS.0000121945.36635.61

Liani, SD, & Hariyanto, E. (2024). Survey of the Physical Condition of Pencak Silat

Athletes of the Setia Hati Terate Brotherhood at the Padepokan, Trenggalek Regency. *Gymnasia : Journal of Physical Education, Sports and Health* , *3 No. 1* , 106 – 120. http://jurnal.anfa.co.id/index.php/PJKR

Mathisen, T.F., Kumar, R.S., Svantorp - tveiten, KME, & Sundgot - borgen, J. (2022). Empowered, Yet Vulnerable: Motives for Sport Participation, Health Correlates, and Experience of Sexual Harassment in Female Combat - Sport Athletes. *Sports* , *10* (5). https://doi.org/10.3390/sports10050068

Nubatonis, J.D., Sulistiyono, S., Husein, M., Septianto, I., Runesi, S., Zakiah, D.M.N., Dewantara, J., Azrina, J., Islam, S., & Salacup, V.L.D. (2024). Optimizing Arm Muscle Endurance in Pencak Silat Athletes: Insights from a Literature Review. *Tanjungpura Journal of Coaching Research* , *2* (3), 131–141 . https://doi.org/10.26418/tajor.v2i3.80838

Nugroho, H., Gontara, SY, Jariono, G., & Saifullah, R. (2025). Body composition and physical fitness characteristics of Indonesian elite pencak silat competitors. *Jurnal SPORTIF : Journal of Learning Research* , *11* (1), 121 – 137. https://ojs.unpkediri.ac.id/index.php/pjk/article/view/25213

Rebelo, A., Martinho, D. V., Valente-dos-Santos, J., Coelho-e-Silva, M. J., & Teixeira, D. S. (2023). From data to action: a scoping review of wearable technologies and biomechanical assessments informing injury prevention strategies in sport. *BMC Sports Science, Medicine and Rehabilitation* , *15* (1), 1 – 14. https://doi.org/10.1186/s13102-023-00783-4

Roberts, MD, McCarthy, JJ, Hornberger, TA, Phillips, SM, Mackey, AL, Nader, GA, Boppart, MD, Kavazis, AN, Reidy, PT, Ogasawara, R., Libardi, CA, Ugrinowitsch, C., Booth, FW, & Esser, KA (2023). Mechanisms of Mechanical Overload-Induced Skeletal Muscle Hypertrophy: Current Understanding and Future Directions. *Physiological Reviews* , *103* (4), 2679 – 2757. https://doi.org/10.1152/physrev.00039.2022

Romadhona, E., & Candra, J. (2024). Evaluation of the Physical Condition Level of Pencak Silat Athletes of the Indonesian Pencak Silat Association (IPSI) Bekasi City in 2024. *Journal of Sports, Fitness and Rehabilitation (JOKER)* , *4* (2), 114 – 123. https://doi.org/10.35706/joker.v4i2.12578

Ruddock, A., James, L., French, D., Rogerson, D., Driller, M., & Hembrough, D. (2021). High-intensity conditioning for combat athletes: Practical recommendations. *Applied Sciences (Switzerland)* , *11* (22). https://doi.org/10.3390/app112210658

Saputro, DP, & Siswantoyo, S. (2018). Norm drafting of pencak silat physical test for adolescent fighting category. *Jurnal Keolahragaan* , *6* (1), 1 – 10.

Scharrer, E., & Ramasubramanian, S. (2021). *Quantitative Research Methods in Communication* .

Schoenfeld, B.J., Grgic, J., Van Every, D.W., & Plotkin, D.L. (2021). Loading

Recommendations for Muscle Strength, Hypertrophy, and Local Endurance: A Re-Examination of the Repetition Continuum. *Sports* , *9* (2), 1 – 25.

Suchomel, T. J., Nimphius, S., & Stone, M. H. (2016). The Importance of Muscular Strength in Athletic Performance. *Sports Medicine* , *46* (10), 1419 – 1449. https://doi.org/10.1007/s40279-016-0486-0

Sugiyono. (nd). *Quantitative, Qualitative, and R&D Research Methods* .

Syaifullah, R., & Lingsir Maghribi, I. (2023). Speed analysis of the front kick technique in 2022 pencak silat world champion athletes: Kinematic analysis. *Jurnal SPORTIF : Journal of Learning Research* , *9* (1), 146 – 159. https://doi.org/10.29407/js_unpgri.v9i1.19983

Triplett, T., Haff, G. G., & Travis, N. (2015). *Essentials of Strength Training and Conditioning* .

Wahid, AN, Nilawati, I., Setiawan, FE, Amin, N., Studi, P., Keolahragaan, I., Kesehatan, F., Waluyo, UN, Fisik, K., & Silat, P. (2024). *Kembangan Regency Magelang Profile of the Physical Condition of Pencak Silat* . 1 – 6.

Wardoyo, H., & Ali, N. (2022). Physical Condition Profile of DKI Pencak Silat Regional Training Athletes During the Covid-19 Pandemic. *Scientific Journal of Sport Coaching and Education* , *6* (2), 75 – 80. https://doi.org/10.21009/jsce.06211

Weakley, J., Mann, B., Banyard, H., Mclaren, S., Scott, T., & Garcia-ramos, A. (nd). *Velocity-Based Training : From Theory to Application* . 31 – 49.

Yang, P., Xu, R., & Le, Y. (2024). Factors influencing sports performance: A multi-dimensional analysis of coaching quality, athlete well-being, training intensity, and nutrition with self-efficacy mediation and cultural values moderation. *Heliyon* , *10* (17), e36646. https://doi.org/10.1016/j.heliyon.2024.e36646

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