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Analysis of physical condition of Pencak Silat athletes of DKI Jakarta Sustainable Achievement Sports Development (SASD)

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Abstract
Physical fitness is crucial for athletes. Researchers aim to measure, compare, and analyze physical components to optimize performance. This study assessed the physical fitness of 34 DKI Jakarta martial arts athletes through various tests. The research used qualitative descriptive, the research subjects of all DKI Jakarta martial arts athletes totaled 34 athletes, the instruments used were 20 M speed, Agility Y-Test, Power (Leg) Vertical Jump, Wall Pass coordination, Flexibility V sit and Reach, Balance Standing Strork (blind), Core strength with Elbow Plank, and Aerobic Endurance Bleep Test Results showed that while most components were satisfactory, flexibility and coordination required improvement. A comprehensive training program is recommended to address weaknesses and maintain strengths to enhance overall performance. Coaches should prioritize injury prevention and rehabilitation to ensure athletes' well-being.

Keywords: Prioritize, prevention, rehabilitation

1. Introduction
Sports achievement is a sport that shapes and forges athletes competitively whose application when training must be planned, graded, and sustainable to achieve achievements supported by sports science and technology or wear science. Sports achievements certainly cannot be separated from a tortuous process and cannot be achieved instantly but many factors influence. Therefore, training with a special level is needed, one of which is an example of the concentration or special coaching of talented athletes who are often carried out in the regions (Mukti et al., 2023) [5].
A physical condition is a whole unit of components that cannot be separated, both in improving and maintaining it. Every physical exercise is an important aspect of training for improving athlete performance. It should be noted that physical condition training in each component effect will be:

- The quality of flexibility becomes increasingly improved and good,
- The speed of movement becomes higher,
- The ability of muscle strength becomes greater, and
- The endurance of the heart muscle increases during movement (Yulingga Nanda Hanief, 2019) [10].

A prime physique will provide long-term benefits for athletes they will be easy and able to master every very difficult skill, not quickly fatigue every time they do training and competition activities, training sessions will be completed without many obstacles and the recovery process will be faster. In addition, physical condition training boosts a confident attitude and will prevent athletes from the potential risk of injury (Citra et al., 2021) [2].
Pencak silat is a martial art sport that demonstrates fighting skills and the ability to perform standardized moves. Pencak silat sports also require athletes to have complete physical components, one of which is strength (Widiastuti & Mulyani, 2017) [9]. According to Jonath & Krempel, physical condition is a condition in a person that indicates he is prime consisting of strength, speed, endurance, flexibility, coordination, and agility (Nopiyanto et al., 2023) [7].

Compared to other more advanced sports, pencak silat is still relatively new to the international performance sports scene. Standardization of techniques, scoring systems, and competitions that are not yet fully integrated are challenges for the development of pencak silat. In fact, with its rich techniques and philosophy, pencak silat has great potential to become one of the most popular sports in the world. Therefore, it is important to implement more professional and systematic management in pencak silat achievement training (Lumbantungkup et al., 2024) [4].

Pembinaan Olahraga Prestasi Berkelanjutan (POPB) is a talented athlete development program under the auspices of the DKI Jakarta Provincial Youth and Sports Agency (Diaspora) aged under 15 years which is decentralized training through the Wear Science and LTAD (Long Term Athlete Development) approaches in DKI Jakarta Province. In particular, Sustainable Achievement Sports Development (POPB) has been carried out starting at elementary school age to college (Abdurohman et al., 2022) [1].

Reviewing the literature that researchers have read related to physical conditions, athletes can achieve perfection if supported by the main prerequisite, namely excellent physical condition by the characteristics of the sport they are engaged in. Athletes who have excellent physical condition will get more points if they are at a higher level, especially at the achievement level. In addition, excellent physical condition will have a positive effect on children's academic abilities. (Nopiyanto et al., 2023b) [7].

The purpose of this study is to measure, compare, and analyze the results of physical conditions. Then look at the results of the physical aspects of various motor components and body composition. Data collection focusing on DKI Jakarta's fostered athletes. Sustainable achievement development seeks the relationship between the achievement of physical condition and the achievement of achievement in the long term.

2. Materials and Methods

This research uses descriptive qualitative with the research subjects of all DKI Jakarta SASD martial arts athletes totaling 34 athletes. The instruments used are speed 20 M, Agility using Y-Test, Power (Leg) using Vertical Jump, coordination using Wall Pass, Flexibility using V sit and Reach, Balance using Standing Strork (blind), Core strength with Elbow Plank, and Aerobic Endurance using Bleep Test. data collection procedures, and data analysis presented in paragraph form.

3. Results & Discussion

Table 1: Benchmark item test

No	Component	Item Test	Benchmark (M)	Benchmark (F)	Unit
1	Speed	20m Dash	3,49	3,61	Sec
2	Reactive Agility	Y-Shape Test	3	4,36	Sec
3	Coordination	Hand Wall Toss Ball	35	35	Rep
4	Power	Ver. Jump	47	40	Watt / Cm
5	Flexibility	V - Sit n Reach	28	29	Cm
6	Balance	Blind Standing Stork	60	60	Sec
7	Core Stability	Plank Test	120	120	Sec
8	Aerobic	20 m Beep Test	61	61	ml/kg/min

This study adopts age criteria that are adjusted to biomotor aspects, this research is expected to produce more accurate and relevant measurements of physical condition so that it can provide a more comprehensive picture of the physical development of pencak silat athletes. Benchmarks for speed, reactive agility, coordination, control, flexibility, alter, center robustness, and oxygen expenditure were obtained from journals according to age category. Male and female adolescent athletes identified as gifted showed higher speed in the 10m and 20m runs and lower body strength compared to general population adolescents of the same age. Female athletes identified as having adolescent aptitude were higher than the general population, and body mass did not differ between groups for either gender (Larkin et al., 2023) [3].

Fig 1: Average speed and reactive agility

The results of the physical speed and reactive agility tests are considered good because the average of each athlete is good and also gets an average of 3.45. The 20 m sprint run test at an average of 3.45 is considered good because the benchmark is 3.49 for individuals, but if the average is 3.49 then the value is considered good. Then the value of reactive agility with an average of 2.69 is considered very satisfying because it is below the number 3 or the benchmark number. This value

is considered maximum because the athlete has a good reaction. The results of speed and reactive agility are separated with 6 other items if put together it will look small therefore it is separated so that the value is not considered small. Then for speed and reactive agility the smaller the number, the better because it plays with time.

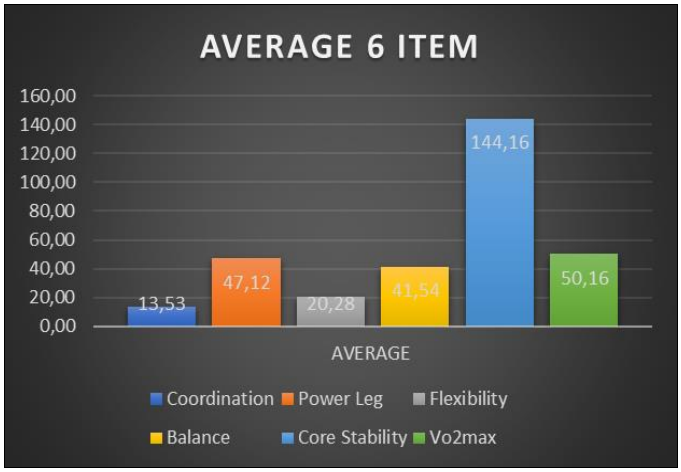

Fig 2: Average coordination, power leg, flexibility, core stability dan Vo_2Max

The value of coordination and the value of flexibility is fairly small and flexibility is very prone to injury, the more flexibility is small, the more prone to injury or the greater the effect of injury, because pencak silat matches require high flexibility for the kicking process and also for the guarding process when defending the body during the pull process to slam.

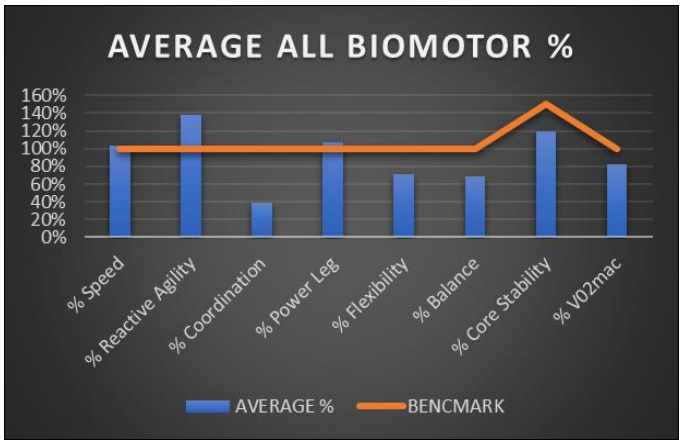

Fig 3: Average biomotor %

Average data using percentages get maximum results but have deficiencies in several points such as coordination and balance. These results show that when these 2 points when the results are small it will be prone to injury more than 7 people out of 34 athletes suffered injuries in the knee and abductor area as a factor of the small flexibility results and when the balance results are small it will result in support when the athlete stands, and also defense when it will be slammed.

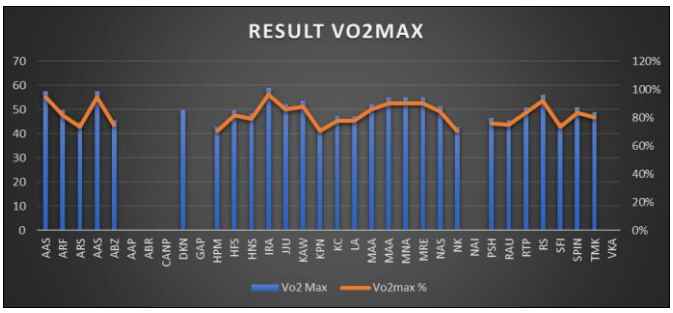

Fig 4: Result Vo_2max

The data generated as a whole 2 athletes did not take the test entirely because they participated in the championship, therefore the data results are blank, several athletes have suffered injuries and are not allowed to take the test at the direction of the doctor to avoid worsening injuries.

The significant difference in this study lies in the selection of test flexibility. Instead of using Sit and Reach, this study uses V Sit and Reach which is measured to be more able to measure the dynamic origin which is more relevant to movements in pencak silat sports. Flexibility is one of the

important components of physical fitness related to health. Hamstring and low back flexibility are important to perform daily activities and to prevent the development of muscle pain that may occur due to poor flexibility (Parmar Darshan et al., 2019) [8].

Compared to the shuttle run, the Y test is considered better in measuring the athlete's ability to respond to sudden changes in direction. This makes it a relevant measuring tool to assess the readiness of pencak silat athletes in facing dynamic match situations. Reactive agility often called Change of Direction (COD) is the skill and ability required to change the direction of movement, speed, or mode, as defined in a textbook endorsed by the National Strength and Conditioning Association (Nimphius et al., 2018) [6]. Agility plays a role in unexpected movements, especially in the movement of moving places. Agility is defined as the athlete's ability to change position quickly. (Yulingga Nanda Hanief, 2019) [10].

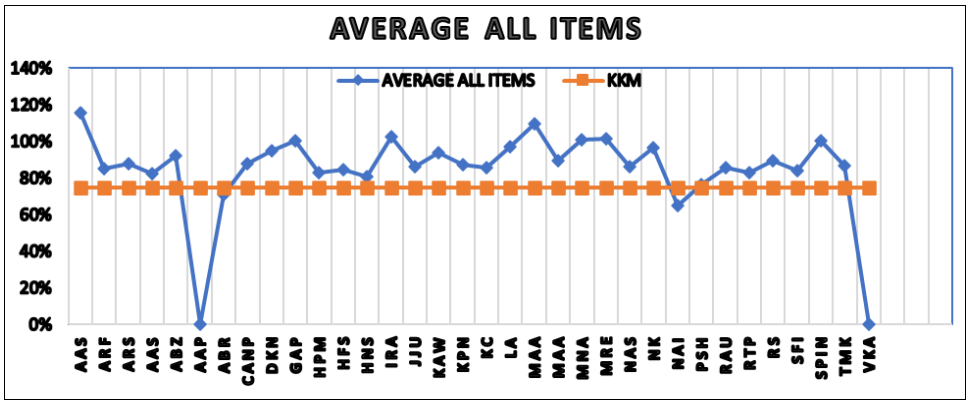

Fig 5: Average all items

The results of the athlete's physical test almost entirely touched the maximum number. Some athletes do not achieve maximum results due to several factors, the first is because they follow the championship and the second is injured and it is not recommended to take the test for the recovery period.

4. Conclusions

The results of the physical test or bio motor physical results with a total of 34 athletes are considered good and these results can be the starting point for the SC (Strength and Conditioning) coach to make a training program, these results also show that the small value of flexibility and balance of athletes will make athletes easily vulnerable to injury, especially in the legs, especially the abductor muscles, sartorius, hamstring, gluteus, quadriceps, gastrocnemius and can also make them prone to injury in the area of the upper hips knee joints and also the ankle.

The analysis showed that the physical condition of the Pencak Silat athletes was considered quite good overall. Excellence in certain criteria contributes to the achievements that have been achieved. However, weaknesses in flexibility and balance can be an obstacle to achieving more optimal achievements; therefore, it is necessary to make efforts to improve abilities in both aspects.

5. Acknowledgments

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