

## THE EFFECT OF KICK SPEED, AGILITY, AND CONFIDENCE ON THE ACHIEVEMENT OF YOUNG PENCAK SILAT ATHLETES IN WEST SUMATRA

Suci Wulandari<sup>1</sup>, Heni Widyaningsih<sup>2</sup>, Widiastuti<sup>3</sup>, Ayu Purnama Wenly<sup>4</sup>

<sup>1234</sup>Physical Education, Faculty of Sports Science Universitas Negeri Jakarta, Indonesia

Corresponding author. Email : [wulandarisuci367@gmail.com](mailto:wulandarisuci367@gmail.com)

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**Abstract** This study focuses on the relationship between attack speed, agility, and athlete achievement in pencak silat sports. This research also explores the role of self-confidence as a mediator in the relationship. The purpose of this study is to identify the direct and indirect influence of attack speed and agility on the achievement of pencak silat athletes by taking into account the role of confidence as a mediating variable. This research method uses the statistical analysis path method to test the relationship between these variables. Data were collected from pencak silat athletes and analyzed using significance tests to determine direct and indirect influences. The results of the study showed: attack speed had a direct significant influence on confidence (significance value  $0.025 < 0.05$ ), Agility had a direct significant influence on confidence (significance value  $0.043 < 0.05$ ), Attack speed had a direct significant influence on achievement (significance value  $0.026 < 0.05$ ), Agility had a direct significant influence on achievement (significance value  $0.043 < 0.05$ ), Confidence has direct significant influence on achievement (significance value  $0.000 < 0.05$ ), Attack speed has an indirect influence through confidence on achievement greater than its direct influence, Agility has an indirect influence through confidence on achievement greater than its direct influence. The conclusion of this study shows that attack speed and agility have a significant influence on the achievement of pencak silat athletes, both directly and through confident mediation. The development of attack speed, agility, and confidence should be the main focus in the training program to improve the athlete's performance

**Keywords:** Kick Speed, Agility, Confidence, Pencak Silat



## INTRODUCTION

Science and technology as the basis of the aspect of sports coaching are an integral part of the sports coaching process. Forming reliable athletes is no longer able to be done in traditional ways, therefore it is time to use the coaching method using science and technology to change the pattern of modern sports coaching (Burhaein et al. 2021) .

Scientific sports coaching is required to be the foundation in the process of nurturing and coaching athletes from a program to achieve maximum achievement. Achievement sports is a type of sport that requires the coaching and development of sportsmen in a planned, tiered and sustainable manner through training and competitions to achieve achievements with the support of sports science and technology.

One of the sports achievements that has attracted the attention of many parties is pencak silat. This sport from Indonesia has been developed in almost all regions of Indonesia, including West Sumatra. Various coaching and training programs have been carried out to maximize the achievements achieved by athletes from West Sumatra. This

coaching program is made for early childhood, elementary school (SD), junior high school (SMP), high school (SMA) and even students at various universities and colleges.

To get sustainable achievements, these athletes from West Sumatra participate in various kinds of matches, as well as events held at the city/regency, provincial, national and international levels. These pencak silat championships are held to find out the success rate of the coaching process that has been received by athletes. One of them is the National Student Sports Week (POPNAS). The National Student Sports Week is the highest multi-sport event for students at the national level, which is held every two years.

POPNAS is a prestigious sports competition at the national level for students and is a people's event party in supporting their respective regions to become the best in Indonesia.

Pencak silat is a martial sport consisting of 2 categories of matches. Pencak Silat *as a sport consists of two categories: artistic (art) and combat (tanding)* . The art category focuses on movement patterns, while the fight is a full-contact duel that takes place on a circular mat measuring 8 m in diameter.

Both art and combat in pencak silat require good technical, physical, mental and tactical components to display the movements to the maximum. Physical, technical, tactical and mental components are aspects that need to be trained for silat athletes to get maximum achievements. (so et al., 2018) (Dewi, 2014)

Technique is a special movement owned by certain sports. Techniques in pencak silat are a movement that can be used to attack or avoid the opponent's attack. The basic techniques in pencak silat are defense (evasive, evasive, and parry), attack (punches, kicks, falls, and locks) and down techniques (bottom sweeps, bottom circles, and cuts) (Nugroho in . The basic techniques of pencak silat are in the form of punches, kicks, parries, dodges, drops and sweeps. (Siswantoyo & Graha, 2016) (Nusufi, 2015)

In addition to basic techniques, physical condition is also one of the important factors for athletes to achieve peak achievements. Pencak silat athletes must have a good physical condition in order to get brilliant achievements. (Ridhwan & Hariyanto, 2021) *Physical condition has important role to achieve an achievement in sports* (F Y

Prasetyo, 2017) . Excellent physical condition and strong mentality are the main capital for athletes to excel. The physical components needed by pencak silat athletes include speed (Sundara et al., 2020a) , agility, and endurance of leg muscle strength. According to Awan Hariono in Nurhidayah & Graha (2017) The components of physical conditions required in pencak silat include endurance, strength, speed, coordination, and flexibility (Nurhidayah & Graha, 2017a)

The ability to move quickly is an important component of the sport as well as pencak silat. Speed in pencak silat is needed to anticipate attacks from opponents, make attacks and avoid attacks. (Ihsan & Suwirman, 2018) *The ability to move quickly in a straight line or in different directions (change of direction) is an integral component of successful performance in a variety of sports* (Bompa & Buzzichelli, 2019a) . Speed is the ability to carry out a movement in a short time (Satria et al., 2021)

In addition to speed, agility is also a physical component that must be mastered by pencak silat athletes. *Agility is a complex set of interdependent skills*

*that converge for the athlete to respond to an external stimulus with a rapid deceleration, change of direction, and reacceleration . Agility is a response to the stimulus given by the opponent* (Bompa & Buzzichelli, 2019b) (Young & Farrow, 2013) . Silat fighters who have *good agility* will easily move the whole body quickly, making changes in speed or direction in response to the stimulus received.

In an effort to achieve achievements, self-confidence is a very important aspect for athletes. Confidence has a significant correlation with improving athletes' performance, therefore, confidence is considered a determining factor for success for athletes in various competitions. However, overconfidence can be a problem, especially when athletes feel that their abilities exceed their opponents. This can cause athletes to underestimate their opponents and feel that they will not be defeated by anyone.

In the regional championships and open pencak silat championships in West Sumatra, many young athletes have not reached their maximum potential to compete at the national level. One of the main reasons is a lack of physical condition and a lack of

confidence. This can be seen from the number of athletes who have successfully qualified for the national level (POPNAS) from the regional level (POPWIL) which is still limited. For example, in 2016, there were 10 numbers that managed to pass the Riau POPWIL, while in 2018 there was a decrease so that 8 numbers were recorded to have passed the Aceh POPWIL, and in 2022 there were 10 numbers recorded again at the Jakarta POPNAS PRA which managed to pass athletes to the national level.

Through this study of inmaximity, several things that need to be considered in the training pattern are found to increase the effectiveness of the athletes' technical and physical training. The evaluation showed that there were shortcomings in the repetition of exercises and a lack of adequate pre-facilities. This signals the need for adjustments in the training program to ensure that athletes can develop their abilities to the fullest.

Based on observations on the field during the regional championships, it can be seen that many pencak silat athletes are not optimal in carrying out attacks and lack confidence when doing so. The attacks carried out look less

powerful and slow, so they are easy to predict and anticipate by opponents. As a result, athletes are often easily knocked down by opponents in matches.

Apart from the physical aspect, it is also important to strengthen the mental aspect of athletes, especially self-confidence. Coaches can help athletes to build their confidence through special training and psychological coaching. With the increase in confidence, it is hoped that athletes will be more confident in attacking and competing on the mat.

It is also important to provide athletes with an understanding of the importance of maintaining their overall physical and mental health. Good nutrition, adequate rest, and effective stress management can help improve an athlete's overall physical and mental condition.

In the long term, improvements in the training pattern and mental coaching of pencak silat athletes in West Sumatra are expected to significantly improve their achievements. With continuous improvement, it is hoped that the number of athletes who have successfully qualified for the national level will also increase, and they can compete more competitively in various

competitions at the national and international levels.

The response given by some athletes in training often seems very slow, and they have difficulty moving their whole body and changing direction quickly. This phenomenon provides a clear picture that the physical and confident components have a significant role in the achievements of West Sumatra pencak silat athletes.

Suboptimal physical conditions, such as low kick speed and agility, as well as lack of confidence, have been proven to be factors that cause a decline in the achievements achieved by West Sumatra pencak silat athletes. This reflects the need for problem-solving in improving physical condition and strengthening athletes' confidence.

Seeing the problems faced by West Sumatra pencak silat athletes, the author felt interested in conducting more in-depth research and discussing the direct or indirect influence of speed, agility, and confidence on the achievements of athletes in the area. This research is expected to provide a deeper understanding of the factors that affect the achievement of pencak silat athletes and provide a foundation for the

development of more effective training programs.

The direct influence of speed, agility, and confidence on the achievement of pencak silat athletes in West Sumatra can be the main focus in this study. Direct measurements of athletes' physical abilities and confidence levels, as well as analysis of their relationship to achievement, will be an integral part of the study.

The study will also pay attention to indirect factors that affect the relationship between speed, agility, and confidence and the achievement of pencak silat athletes. For example, environmental factors, social support, and internal motivations of athletes can play an important role in shaping their physical and psychological condition.

The research methods used will include quantitative and qualitative data collection. Direct measurements of athletes' speed and agility can be done through standardized physical tests, while confidence levels can be evaluated through questionnaires or interviews. In addition, direct observation of athletes' training and matches will also be carried out to understand the context more deeply.

Data analysis will be carried out using appropriate statistical methods, such as regression analysis to identify the relationship between independent variables (speed, agility, and confidence) and dependent variables (athlete achievement). In addition, qualitative analyses will be conducted to unearth a deeper understanding of other factors that may influence the relationship.

The results of this study are expected to make a significant contribution to the development of pencak silat sports in West Sumatra. Practical implications of this study could include recommendations for the development of more targeted training programs, as well as suggestions for increasing support and motivation for athletes. Thus, it is hoped that the achievements of West Sumatra pencak silat athletes can increase significantly in the future.

## **METHOD**

In general, the purpose of the study is to find out whether or not there is a direct influence between attack speed, agility and confidence on the achievement of West Sumatra pencak silat youth athletes. In this study, the

population was West Sumatra youth athletes who had achievements from the regional level totaling 200 athletes. The sample technique used in this study is Simple Random Sampling, which means that as many as  $n$  samples are taken from the population of  $N$  and each member of the population has the same chance of being taken. The sample (Sugiono, 2017) used in this study is as many as 150 West Sumatra youth pencak silat athletes, there is this study that is used as a population of West Sumatra youth athletes who have had achievements from the regional level.

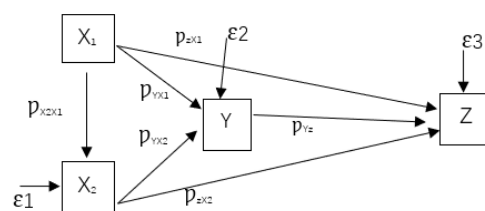
This study uses associative quantitative research methods, with quantitative approaches and survey method techniques and uses path analysis techniques. *Path analysis* is an analysis technique used to analyze the inherent causal relationship between variables arranged based on a temporary sequence by using path coefficient as a value measure in determining the magnitude of the influence of *the exogenous* independent variable on the endogenous dependent variable. This research is classified as a type of quantitative research that uses multiple regression data analysis techniques, after

which it is continued with (Sarwono, 2011) *path analysis*.

Research instruments are tools used to collect data. Instruments help researchers in the process of collecting data on research, in this case the instrument can be accounted for and meet the requirements of test validity and reliability (Attendant, 2016). The instruments in this study are:

The instrument to measure the speed of the sickle kick uses metion capture technology that records movement realistically. To measure agility uses *a one-leg side jump rotation* instrument. To measure confidence with a questionnaire.

The variables studied consisted of four variables consisting of three exogenous variables and one endogenous variable. Exogenous variables consist of attack speed ( $X_1$ ), agility ( $X_2$ ), confidence ( $Y$ ) and endogenous variables are the achievements of Pencak silat youth athletes ( $Z$ ). The pattern of relationships between research variables is involved in the following figure:



**Figure 1.** Constellation Structural relationships between research variables.

Information: X1 is the speed of the kick, X2 Is agility, Y is PEself-discipline, Z Is achievement Px2x1 Is Variable path coefficients x2 with the variable X1, pyx1 Is Variable path coefficients X1 with variable Y, pyx2 Is Variable path coefficients X2 through with variable Y,  $\rho_{x1yz}$  Is Variable path coefficients X1 through with the Z variable, and  $\rho_{x2yz}$  Is Variable path coefficients X2 with the Z variable.

The data analysis technique is carried out through two stages of analysis, namely descriptive and inferential data analysis. First, descriptive data analysis, this is done to analyze the data that has been collected to obtain an overview of the characteristics of the distribution of the values of each variable studied.

Descriptive analysis is used in terms of data presentation, central size, and spread size. Data presentation uses distribution lists and histograms. The central measures include mean, median, and mode. The size of the spread includes variants, and standard

deviations. Second, inferential data analysis is carried out to test the hypothesis using path analysis. Path analysis, all hypothesis tests are carried out using  $\alpha = 0.05$ . Before the hypothesis was tested, the regression galakassiran was first tested, using the Liliefors technique, and the homogeneity of variance using the barlett test technique.

To calculate the direct and indirect influence of an independent variable on the bound variable is reflected in the path coefficient. As for determining the path coefficient, the following assumptions are needed: (1) the relationship between two variables must be a linear, additive and causal relationship; (2) the system adheres to the one-way principle; (3) all residual variables are not correlated and do not correlate with the causal variables; (4) the data of each variable must be continuum;

In the path analysis model, two types of variables are known, namely; exogenous variables and endogenous variables. Exogenous variables have a direct or indirect influence on endogenous variables, while endogenous variables are variables that can affect other endogenous variables.



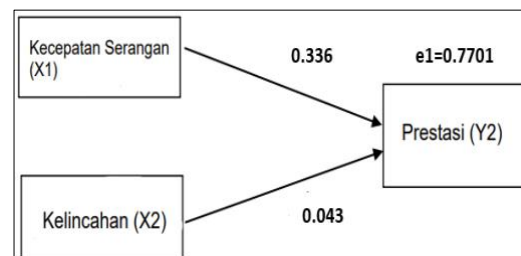
In accordance with the framework of thinking that has been developed, the endogenous variables in this study are Achievement (Z), while exogenous variables include Kick Speed (X1), Agility (X2), and Confidence (Y). The model of the structural equation of this research consists of three types of structures. The calculation was carried out with computer-aided athletes. The program used is a data analysis package contained in SPSS 24.

## RESULT AND DISCUSSION

Referring to the output of Model I Regression in the coefficient table, it can be seen that the significance values of the two variables, namely Speed = 0.025 and X2 = 0.043 are less than 0.05. This result provides a conclusion that the Regression Mod I, namely the variables X1 and X2 has a significant effect on Y. The magnitude of the R2 or R Square value contained in the Model Summary table is 0.407, this shows that the contribution or contribution of the influence of X1 and X2 on Y is 40.7% while the remaining 59.3% is the contribution of other variables that are not included in the study. Meanwhile, for the value of e1, the formula  $e1 = \sqrt{1 -$

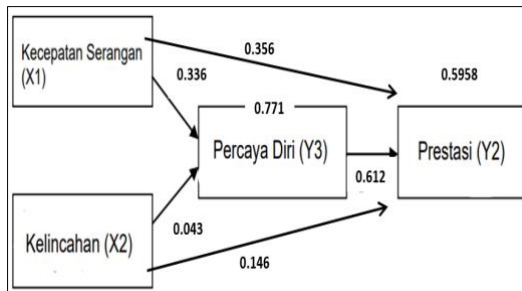
0.407) = 0.7701 can be found. Thus a model path diagram is obtained.

**Figure 2.** Direct Effect X1, X2 Affects Y2



Tables and Figures are placed in the text group after the table or figure is referenced. Each image must be given a Figure Caption at the bottom of the image and numbered in Arabic numerals followed by the image title. Each table must be given a Table Caption and numbered in Arabic numerals at the top of the table followed by the table title. Model II Path Coefficient: Based on the output of Model II Regression in the Coefficients table, it is known that the significance values of the three variables, namely X1 = 0.036, X2 = 0.043 and Y = 0.7701 are less than 0.05. This result concludes that the Regression of Model II, namely the variables X1, X2 and Y has a significant effect on Z. The magnitude of the R2 or R Square value contained in the Model Summary table is 0.645, this shows that the contribution of X1, X2 and Y to Z is 64.5% while the remaining 35.5% is the

contribution of other variables that are not studied. Meanwhile, for the value of  $e2 = \sqrt{(1-0.645)} = 0.5958$ . Thus, the path diagram of the structure model II is obtained as follows:



**Figure 3.** Indirect Effect X1, X2 Affects Y Through Z

The table does not contain vertical lines, horizontal lines are required for the important ones.

Based on the results of *the path analysis*, the results of the hypothesis test are as follows:

1. Analysis of the influence of X1 on Y: from the above analysis, the significance value of X1 is obtained  $< 0.05$ . So it can be concluded that there is a direct significant influence of X1 on Y. Which means that there is a direct significant influence of attack speed on confidence.
2. Analysis of the influence of X2 on Y: from the above analysis, the significance value of X2 is obtained  $< 0.05$ . So it can be

concluded that there is a direct significant influence of X2 on Y. Which means that there is a direct significant influence of agility on confidence.

3. Analysis of the Influence of X1 on Z: from the analysis, the significance value of X1 was obtained of  $0.026 < 0.05$ . So it can be concluded that there is a direct significant influence of X1 on Z. Which means that there is a direct significant influence of attack speed on performance
4. Analysis of the influence of X2 on Z: from the analysis, the significance value of X2 is obtained of  $0.043 < 0.05$ . So it can be concluded that there is a direct significant influence of X2 on Z. Which means that there is a direct significant influence of agility on achievement.
5. Analysis of the influence of Y on Z: from the analysis, it was obtained that the significance value of Y was  $0.000 < 0.05$ . So it can be concluded that there is a direct significant influence of Y on Z. Which means that there is a direct significant influence of confidence on achievement.

6. Analysis of the Influence of X1 through Y on Z: it is known that the direct influence given by X1 on Z is 0.156. Meanwhile, the indirect influence of X1 through Y on Z is the multiplication between the beta value of X1 on Y and the beta value of Y on Z, namely:  $0.336 \times 0.612 = 0.206$ . So the total influence given by X1 on Z is a direct influence plus an indirect influence, namely:  $0.156 + 0.206 = 0.362$ . Based on the results of the calculation above, it is known that the direct influence value is 0.156 and the indirect influence is 0.206 which means that the indirect influence value is greater than the direct influence value, this result shows that indirectly X1 through Y has a significant influence on Z. Which means that indirectly there is a significant influence on the speed of the attack through confidence has a significant influence on achievement.
7. Analysis of the Influence of X2 through Y on Z: it is known that the direct influence given by X2 on Z is 0.146. Meanwhile, the indirect influence of X2 through

Y on Z is the multiplication between the beta value of X2 on Y and the beta value of Y on Z, namely:  $0.403 \times 0.612 = 0.247$ . So the total influence given by X2 on Z is a direct influence plus an indirect influence, namely:  $0.146 + 0.247 = 0.393$ . Based on the results of the calculation above, a direct influence value of 0.146 and an indirect influence of 0.247 were obtained, which means that the indirect influence value is greater than the direct influence value, this result shows that indirectly X2 through Y has a significant influence on Z. Which means that indirectly agility through confidence has a significant influence on achievement.

The results showed that athletes who had faster attack speeds had higher confidence. In previous research, the results show that the development of Pencak Silat in the field of education can increase students' confidence through improving skills and abilities in various aspects, including attack speed (Subekti et al. 2020). Faster attack speeds can increase athletes' confidence in several

ways. First, faster attack speed can improve athletes' ability to face opponents, thereby increasing their confidence (Setyawati 2014). Second, faster attack speed can improve athletes' ability to master attack techniques, thereby increasing brand confidence (Babintsev et al. 2022). Third, faster attack speeds can improve athletes' ability to deal with pressure and stress, thereby increasing their confidence (Setyawati 2014). Although in pencak silat, the class category and athlete anthropometry greatly affect the speed of attacks.

This study shows that there is a significant influence between Agility (X2) and Confidence (Y). These findings are consistent with several previous studies that underscore a positive relationship between physical agility and increased confidence levels. For example, research by (Liang et al. 2019) found that athletes with high agility tended to have better confidence in competitive situations due to their ability to move quickly and effectively. In addition, articles from (Dinata, Umar, and Argantos 2020) stated that increased agility is related to a positive perception of self-ability, which directly increases self-confidence.

This study shows that there is a significant influence between Attack Speed (X1) on Achievement (Z) in the context of sports. These findings are consistent with a number of previous studies that highlight the importance of attack speed in improving athlete performance. For example, research by (Subekti et al. 2020) found that athletes with high attack speed tended to perform better due to their ability to respond and anticipate opponents' movements effectively. Other research by (Christensen and Smith 2018) It also shows that the high speed of attack allows athletes to control the dynamics of the match, which in turn increases their chances of winning.

This study shows that there is a significant influence between Attack Speed (X1) on Achievement (Z) in the context of sports. These findings are consistent with a number of previous studies that highlight the importance of attack speed in improving athlete performance. For example, his previous research revealed that agility training can improve the ability of the sickle kick and the overall achievement of martial arts athletes. In previous research (Sandford, Laursen, and Buchheit 2021) Improvement of movement agility

ability due to agility training on the achievement of martial athletes.

The results showed that there was a significant influence between confidence and achievement, which could be analyzed from various perspectives, especially when associated with classes in pencak silat sports classified by weight. From a physiological point of view, athletes with greater weight and height, such as in classes G, H, and I, often have fewer opponents than lighter classes, resulting in tighter competition. Confidence in this context is crucial as it helps athletes cope with the pressure of higher competition and strengthens their mentality to stay focused and dare to take risks during the game (Mantha Dabuke et al. 2023).

The results of this study revealed that the speed of the attack has a significant influence on the achievement of youth pencak silat athletes, which is mediated through self-confidence. These findings indicate that the speed of the attack not only has a direct impact on achievement but also indirectly through increased confidence. Supported by previous research that attack speed is a critical skill in pencak silat that allows athletes to dominate opponents (Doewes, Elumalai, and Azmi 2022). High attack

speed increases the chances of scoring points and avoiding the opponent's attacks, which directly contributes to better performance. In addition, they stated that the speed of the attack increases confidence because athletes feel better prepared and able to face various situations in the arena. In the theory of self-efficacy (Bezjak and CeciĆ Erpič 2021) It also explains that belief in one's own ability to perform quick and precise strikes strengthens self-confidence, which in turn improves athletes' performance and achievements.

The results of the study that show a significant influence of agility through confidence on achievement can be analyzed from various perspectives, especially when associated with classes in pencak silat sports classified by weight. In pencak silat, the classification by weight ensures that the match takes place fairly and balanced. Agility in this context is greatly influenced by the body composition and physical condition of the athlete. Lighter athletes may have an advantage in terms of speed and agility, while heavier athletes may rely on strength. (Díaz-Martínez et al. 2024) However, research shows that agility combined with confidence can improve

overall performance, regardless of weight class (Duma et al. 2012).

## CONCLUSION

Based on the results of the research that has been carried out, several main conclusions can be drawn as follows:

1. The speed of the attack has a significant direct effect on confidence. This indicates that an increase in attack speed can directly increase athletes' confidence.
2. Agility also has a significant direct influence on self-confidence. This indicates that more agile athletes tend to have a higher level of confidence.
3. The speed of the attack directly has a significant effect on performance. This means that the increase in attack speed will immediately have a positive impact on athletes' achievements.
4. Agility has a significant direct influence on achievement. This means that more agile athletes tend to achieve higher achievements.
5. Self-confidence has a significant direct influence on achievement. This indicates that a higher level

of confidence will improve the athlete's performance.

6. With a greater indirect influence than direct influence, these results suggest that the speed of attack through confidence has a significant influence on performance. This means that confidence plays an important mediating role in the relationship between attack speed and achievement.
7. With a greater indirect influence than direct influence, these results show that agility through self-confidence has a significant influence on achievement. This signifies that self-confidence is also an important mediator in the relationship between agility and achievement.

Overall, this study emphasizes the importance of attack speed and agility in improving athletes' performance, both directly and through increased confidence. The development of attack speed and agility, as well as strategies to increase self-confidence, should be the focus of the training program to achieve optimal performance in pencak silat.

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