

**Horse Kick Analysis For Junior Athletes Single Arts Category : Suitability and Practice****Tafriyadhur Risa Billah<sup>1✉</sup>, Setya Rahayu<sup>2</sup>, Fajar Awang Irawan<sup>3</sup>, Ipang Setiawan<sup>4</sup>**Universitas Negeri Semarang, Semarang, Indonesia<sup>1234</sup>**Article History**

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**Abstract**

This study aims to determine the suitability of the movement of horse kicks which is one of the movements that is considered to have the highest artistic beauty, horse kicks are considered to have a high level of difficulty compared to other movement techniques. horse kick is an attack in the art category that is effective for generating high points. The type of research used is quantitative descriptive analysis using the observation method. The sample for this study was athletes in the junior singles arts category in Jepara district, totaling 10 athletes. This study used data analysis techniques using Kinovea software version 0.9.5. Based on the results of the motion suitability analysis in the implementation phase, stages one to 3 obtained an average of 2.12. The results of this study indicate that all horse kick movement indicators are included in the "appropriate" criteria. There needs to be a significant improvement and increase in movement by using guidelines that are in accordance with the applicable rules in order to get maximum movement and fall into the very appropriate category, through improving the performance movement to the maximum so that it is worth competing in and preventing mistakes that risk causing injury to athletes.

**How to Cite**

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## INTRODUCTION

The traditional sport of pencak silat is an original martial art of Indonesian cultural heritage which is now an achievement sport on the national and international levels which is often competed under the auspices of the Indonesian pencak silat association.

Sucipto et al., (2021) added that the martial arts of pencak silat is a cultural heritage from the ancestors of the archipelago, namely the Indonesian people. There are aspects of values contained in pencak silat that are interrelated, this is in line with (Setyo Kriswanto, 2018) revealing that when viewed from the identity and rules of pencak silat, it is a counterweight to cognition for the physical body and a means of forming a spiritual mentality in forming individuals who are able to living and practicing and living the philosophy of noble character as a sport that is often competed in the international arena.

According to Amjad & Mega, (2016) pencak silat is a place for sports achievements that can be contested, pencak silat has 4 categories that are competed, namely, the competition category, the double art category, the single art category, the team art category. "Elements of the martial dance are also found in the movement repertoire of traditional dances, including zapin (a dance popular in Johor that has Persian influences) and asli (literally, "original," fore runner of Malay traditional dance). The aesthetic that informs these dances may derive from practical applications of the martial arts" (Latiff, 2012). In this sentence it is concluded that the moves in this martial sport have elements of conventional dance.

Horse kick is one of the techniques contained in the single art category. The horse kick is a kick that is relatively difficult to demonstrate for a fighter, even though the fighter is a trained athlete, because it requires a complex training process in its implementation. Based on research conducted by Aga, (2020) that the horse kick attack is the most difficult technique in the single art category, because it has a series of movements that must perform air clipping movements when the limbs are flying in the air by forming an angle of inclination of the body simultaneously with the shortest time in short according to the standard rules. PERSILAT, (1998) states that in this standard single art category the chances of victory are determined by the magnitude of the correctness value of motion, stability of movement, stamina, and time. More efficiency to get high points is in the horse kick motion. According to PERSILAT, (2021) the highest value contributi-

on lies in the beauty of the acrobatic movements which are in the stability and correctness of the movements, namely reaching 50 to 60 points. The execution of the horse kick is done by resting the body on both hands, the body is lifted, the heels are pressed against each other to become the tip of the attack and the angle of the body is 60 degrees. The things that need to be considered in demonstrating horse kick movements are fast and precise. Because this technique has several weaknesses which include being difficult to demonstrate according to applicable rules, high risk of injury, and is one of the determinants of the size of the scale for assessing the stability of the athlete's movement in this category.

According to the Depdiknas, (2008) sports biomechanics is a science related to the influence of natural laws on the human body during physical activity. According to Astuti et al., (2015) Biomechanics (Biomechanics) is not only used in technical improvement in sports, but is also widely used by experts outside the field of sports science, for example in medicine, as well as the design of tools needed to man. According to Barikah Amalia, (2018) explained some of the goals of sports biomechanics, including knowing a series of movements efficiently and effectively and the factors that can affect the scale of success. It is necessary to have basic rules or standard kicks in equating the mechanics of horse kicking to be able to analyze the mechanism of body segmentation and the efficiency of horse movements in athlete demonstrations so that they have more standard provisions and have continuity.

According to Jati, (2015) explains that the achievement of achievements is greatly influenced by the technique at the initial and foundation stages, if it is not correct it will cause stagnation or not develop in achieving achievements. Therefore, often in analyzing an event, if you only use the sense of sight without tools, it will be a limitation. The intended tool is the camera as a documentation in capturing a movement and assisted by software or analysis system as a supporting component. The execution of the horse kick is carried out in fractions of a second and it will be difficult if it is only analyzed using the sense of sight. This is considered less than optimal because the human eye has limitations in seeing things with fast movements. Therefore we need tools in the form of video recordings that can facilitate the process of analyzing horse kicks. In the field of biomechanics, there are two main goals in sports, namely reducing the risk of injury and increasing performance (Kurniawan, 2010) Therefore, analysis in pencak silat is needed as a pro-

cess of improvement so that it can help athletes and coaches to know the steps in learning about human body motion. In the world of sports, biomechanics explains the structure of the human body when a person moves or performs motion techniques. According to Kurniawan, (2015) revealed that the factors that exist in biomechanics include the nature of the force (movement angle), the nature of the movement, and the principles of mechanics, as biomechanics itself is an intermediary used to correct motion errors so that movements are corrected and avoid injury.

According to Irawan et al., (2019) explained that biomechanical analysis can help knowledge of technical correctness and can evaluate performance or give the best performance, with periodic monitoring and correction notes providing reference and useful in improving movement performance and development. Irawan et al., (2021) also added that to get maximum results you need a combination of techniques that are mutually sustainable in a routine and correct manner, this has the potential to reduce the risk of injury. that way it can be known the suitability of the motion with the biomechanical analysis. Through the correct mechanics aspect, movement techniques can minimize movement errors while at the same time correcting movements that are not in accordance with the rules so that athletes will periodically improve their movements to become more correct mechanically, it is hoped that with corrective improvements to horse kick movements it will make it more effective and efficient to minimize mild to fatal mistakes in the movement of horse kicks in pencak silat.

In terms of the mechanics aspect of the sport of pencak silat, because of the many junior athletes who have difficulty in carrying out the motion in achieving the suitability of the motion that has been set by the IPSI standard, the researcher is interested in taking the theme of the analysis of Horse Kicks in Single Art Junior Category Athletes Martial arts.

## METHODS

The type of research used in this research is quantitative descriptive analysis. Quantitative research is research by producing discoveries that can be achieved (obtained) using statistical procedures or other means of quantification (measurement) (Wiratna Sujarweni, 2014). (Sukmadinata, 2007), suggests that descriptive research describes and examines scientific or human-engineered phenomena regarding their characteristics, forms, relationships, changes, similarities,

and differences with other phenomena. While the observation method is carried out by observing directly and recording things that are needed as research material, and the structured observation method according to prof. dr. sugiyono, (2011), is used to collect information that has been designed systematically using instruments that have been tested for their validity and reliability. The research was located in the pendopo hermitage, Mayong sub-district, Jepara district, with the population in this study being athletes in the junior single arts category of pencak silat, Jepara Regency. The population is the total number of units or individuals whose characteristics are to be studied (Muchlisin Riadi, 2020). And these units are called units of analysis, and can be people, institutions, things, etc. According to Hidayat, (2012) the sample is part of the population that is the focus of our research, within the scope and time that we specify. The research sample is part of the population that is used as research subjects as a "representative" of the members of the population (Supardi, 1993). The sample for this study were athletes in the single arts category for youth (6-10 years old) and these athletes had at least attended a centralized training or training center at the Jepara Regency level. The sampling technique in this study used purposive sampling. According to Sugiono, (2016) purposive sampling, namely a sampling technique with certain considerations or studies that do not generalize can use purposive, including athletes who have at least participated in championships at the city/district level in Jepara district. The data obtained in this study were obtained through kinematic data originating from the analysis of the video recording of horse kicks during the execution phase. According to Arikunto, (2009) this percentage analysis technique uses a nominal system in the form of numbers to get data results, namely assessment blanks. This horse kick analysis is seen from the perspective of biomechanics. Researchers used the Kinovea software application version 0.9.5. The sampling technique used in this study was purposive sampling.

## RESULTS AND DISCUSSION

**Table 1.** Body Mass Index of Athletes in the Single Art Category of Pencak Silat

n=10	Description	Min	Max
Height	157,7 ± 6,21	149	165
Weight	48,4 ± 3,59	44	55
Age (year)	8,8 ± 1,22	6	10

**Table 2.** Results of the Appropriateness Assessment of Horse Kick Movement

n=10	Indicator	Mark			
		SS	S	KS	TS
Stage 1	Body leaning forward	20 %	10 %	70 %	-
	Palms stick to mat with a parallel position and shoulder-width apart	10 %	30 %	30 %	30 %
	Direction of view and head facing mattress	-	40 %	40 %	20 %
	The focus is on the soles of the feet and hands attached to the mat	-	30 %	40 %	30 %
	Half-squat legs and stand still flexing	20 %	10 %	60 %	10 %
	Body leaning position dive towards the mat	10 %	20 %	50 %	20 %
	The position of the hands ready at the sides of the body	10 %	30 %	40 %	20 %
Stage 2	While rotating slightly tiptoe	20 %	10 %	40 %	30 %
	The tip of the front of the sole of the foot used as the shaft when rotating	20 %	10 %	50 %	20 %
	The position of the legs is squatting and resting on the toes	10 %	40 %	40 %	10 %
	Body position slightly leaning forward	10 %	30 %	30 %	30 %
Stage 3	Head and gaze facing mattress	10 %	40 %	20 %	30 %
	Both legs together and extended position	30 %	10 %	10 %	50 %
	The ankle joint is flexed 45 degrees	20 %	10 %	40 %	30 %
	Shoulder joints, knee joints to ankle joints are in a linear line torso & body form a diagonal plane with a slope of 75 degrees	-	30 %	10 %	60 %

**Table 3.** Horse Kick Movement Compatibility Data

n=10	Score	Criteria	Min	Max
Stage 1	2,26	In accordance	2	4
Stage 2	2,3	In accordance	1	4
Stage 3	1,88	Notsuitable	1	4
Average	2,12	In accordance	1	4

**Table 1.** is a description of the research sample data in tabular form. The value of n is the total number of research samples. The results of the descriptive analysis in the table above show that the average height of the sample is 157.7 cm with the highest height of 165 cm and the lowest height of 149 cm with a standard deviation of ± 6.21cm. Furthermore, the average sample weight was 48.4 kg with the highest body weight of 55 kg and the lowest body weight of 44 kg with a standard deviation of ± 3.59 kg. Furthermore, the average age of the sample is 8.8 years with the highest age being 10 years and the lowest age being 6 years and the standard deviation of ± 1.22 years.

**Results of the Appropriateness Assessment of Horse Kick Movement**

**Table 2** shows that at the initial stage of the research sample or by 20%, the Agency leaned forward "very suitable" and 1 sample or by 10% was included in the "appropriate" category and 7 samples or by 70% were included in the "less appropriate" category. Testing Palms attached to the mat with a parallel position and shoulder-width apart obtained the results of 1 sample or 10% included in the "very suitable" criteria and 3 samples or 30% in the "appropriate" criteria and 3 samples or 30% in the "less suitable" criteria. appropriate", and 3 samples or 30% fall into the "not appropriate" criteria. Testing the direction of view and the head facing the mattress results in 4 samples or 40% falling into the "appropriate" category, and 4 samples or 40% falling into the "unsuitable" category and 2 samples or 20% falling into the "not suitable" category. Testing The focus is on the soles of the feet and both hands attached to the mattress, 3 samples or 30% were included in the "appropriate" category, and 4 samples or 40% were included in the "unsuitable" category and 3 samples or 30% were included in the "not suitable" category. Testing the limbs half-squatting and standing and still flexing gets the results of 2 samples or 20% included in the "very suitable" category, and 1 sample or 10% included in the "appropriate" category, 6 samples or 60% included in the "appropriate" category. not appropriate", and 2 samples or 20% fall into the "not appropriate" category.

During stage 2 of the test, the body is in a leaning position towards the mattress. The results show that 1 sample or 10% is in the "very suitable" category, 2 samples or 20% are in the "appropriate" category, and 5 samples or 50% are in the "appropriate" category. inappropriate" and 2 samples or 20% fall into the "not appropriate"

category. Testing the position of the hands at the side of the body obtained 1 sample or 10% included in the "very suitable" category, 3 samples or 30% were included in the "appropriate" category, 4 samples or 40% were included in the "less suitable" category and 2 sample or as much as 20% fall into the "not appropriate" category. Testing While turning your feet slightly on tiptoe, you get 2 samples or 20% included in the "very suitable" category, 1 sample or 10% included in the "appropriate" category, 4 samples or 40% included in the "less suitable" category and 3 sample or 30% fall into the "not appropriate" category. Testing the front end of the soles of the feet is used as a pivot when rotating to get the results 2 samples or 20% are in the "very suitable" category, 1 sample or 10% is in the "appropriate" category, 5 samples or 50% are included in the "appropriate" category. inappropriate" and 2 samples or 20% fall into the "not appropriate" category. Testing the position of the legs squatting and resting on the toes got the results of 1 sample or 10% included in the "very suitable" category, 4 samples or 40% were included in the "appropriate" category, 4 samples or 40% were included in the "less suitable" category. " and 1 sample or 10 are included in the "not appropriate" category.

In stage 3 of the test, the body position is slightly leaning forward, 1 sample or 10% is in the "very suitable" category, 3 samples or 30% are in the "appropriate" category, 3 samples or 30% are in the "less appropriate" category. ", and 3 samples or 30% fall into the "not appropriate" category. Testing the head and view facing the mattress results in 1 sample or 10% falling into the "very suitable" category, 4 samples or 40% falling into the "appropriate" category, 2 samples or 20% falling into the "less appropriate" category, 3 sample or 30% in the "not appropriate" category. Testing the two legs together and in an extended position resulted in 3 samples or 30% falling into the "very suitable" category, 1 sample or 10% falling into the "appropriate" category, 1 sample or 10% falling into the "less appropriate" category and 5 samples or 50% fall into the "not appropriate" category. Testing the 45-degree flexion ankle joint results in 2 samples or 20% falling into the "very suitable" category, 1 sample or 10% falling into the "appropriate" category, 4 samples or 40% falling into the "less appropriate" category and 3 samples or 30% fall into the "not appropriate" category. Testing the shoulder joint, knee joint to the ankle joint is in a linear line torso & body forming a diagonal plane with a slope of 75 degrees to obtain the results of 3 samples or 30% included in the "appropriate" category, 1

sample or 10% included in the category "not appropriate" and 6 samples or 60% fall into the "not appropriate" category.



**Figure 3.** Phases of the Horse Kick Movement

The average total score or value of the suitability of the horse kick motion of athletes in the Junior category of single arts pencak silat in Jepara Regency is shown in Table 3. Below,

**Table 3.** The above shows that the average total horse kick from the suitability analysis of the horse kick motion has an average of 2.12 with the "Suitable" criteria, in Stage 1 the average is 2.26 with the "Suitable" criteria, in stage 2 average 2.3 with the criteria of "Suitable", at stage 3 the average is 1.88 with the criteria of "Not Appropriate". The ideal motion match is the match phase which is fast, precise and according to the standard IPSI movement (MUNAS IPSI, 2012). This study focuses on stage 3 which refers to the implementation phase in a series of horse kicks. This is the stage where a fighter can represent the most difficult art out of 100 movements of 14 standard moves in a single art category. Based on the results of the analysis of this study, the total overall stage 1 to stage 3 in the implementation phase has an average of 2.12 at this stage, all athletes do it in the "appropriate" category.

In stage 1 or the preparation stage, the body is leaning forward, the palms are attached to the mat in a parallel position and shoulder-width apart, the head and gaze are facing the mat, the pedestal is on the soles of the feet and both hands are attached to the mat, the legs are half-squat and standing and still do flex. According to Aga,(2020) at this stage there is a pushing force movement carried out by the body mass which is given to the two arm muscles to make it easier for the legs to lift. At this preparatory stage, all samples had an average of 2.26, dominated by the appropriate criteria.

In stage 2, namely the leg lifting stage, the body is inclined to dive towards the mat, the hips begin to be lifted together with the legs that are half flying, the legs are in a flexed and tight position, full support is on both arms and palms and the width of the support is shoulder-width apart. At the leg lift stage, the entire sample has an average of 2.3 with the predominance of appropriate criteria.

In stage 3, namely the stage of maximal extension of the leg which begins with the prodding of the two legs in a diagonal direction and the ankle joint parallel to the knee joint and shoulder joint. Straight arm support helps stabilize the body being lifted. The heels are pressed against each other, and the ankles are flexed to allow the heels to become the tip of the strike. If the position of the arms is not parallel, it is likely that there is an imbalance in the body segment lines that are seen in the proper phase. The entire sample has an average of 1.8 with the "less appropriate" criteria. Based on the data obtained at the maximum extension stage, there is a need for significance in increasing the justification of movements according to the applicable rules in order to get movements that fall into the "Very appropriate" category, this is done considering that the maximum extension stage is the spearhead of a series of horse kick movements and even single arts. So that the movement is worth competing in and prevents the risk of injury to athletes.

## CONCLUSION

Based on the results and discussion of this study it concluded that in the implementation phase in stage 1, namely preparation, stage 2, namely leg lift, phase 3, namely the maximum extension of the horse kick, there were 5 athletes who had a suitability with an average score of 2.12 and entered in the appropriate criteria. It is hoped that future research will be able to refine current research related to the analysis of horse kick motion, in order to be able to obtain maximum results because in current research, especially at the maximum extension stage, it has not obtained maximum results and it is hoped that for further research it will have novelty related biomotor components specifically related to speed, distance, angle, body segmentation, power and muscles that play a role in it.

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