

The Effect of Agility and Coordination on the Footwork Ability of Children Aged 8 to 10 Years of Koto Tengah In Padang City

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Abstract—Based on preliminary studies, the problem in this research is the ability of footwork that is still not good. This is thought to be caused by many factors, the authors suspect among the contributing factors are the agility and coordination that children have. This study aims to look at the effect of agility and coordination on children's footwork ability levels. The population in this study were grade 3 and 4 elementary school students in Koto Tengah District, Padang City. The sampling technique was random sampling, so the sample was 107 children. The instrument used to obtain data on agility was t-test, coordination with cable jump while footwork with ITN test. Based on the results of research conducted there are: (1) agility contributed 23.1%, (2) coordination and contributed 28.7%, (3) the effect of agility and coordination on the ability of footwork with a calculated value of 0.389 > r table 0.176 and a significant value (Sig) is 0,000 smaller than the probability of 0.05 with a regression value of $Y = 11.94 + 0.339X_1 + 0.422X_2$. The results of this study indicate that the footwork ability possessed by elementary school students in Koto Tengah Subdistrict, Padang City is influenced by their agility and coordination. The better the criteria of agility and coordination they have, the better the footwork ability they are able to display.

Keyword - Agility, Balance, Footwork Ability

I. INTRODUCTION

Footwork is a basic foundation that is very important for every child to be able to play tennis games easily. Based on the observations and experiences of researchers in the lectures of sports students at the Faculty of Sport Science, Padang State University, it can be seen that in terms of speed and footwork in tennis lectures, they have not been able to show optimally. This situation has an impact on the results of the stroke technique taught because when hitting the body it is never in the comfort zone to execute the ball correctly. Though Footwork is an important factor in an effort to master a sport, because with Footwork a person can always be in a favorable position to execute certain sports techniques.

Agility is the ability to change the position of the body or the direction of body movements quickly when it is moving fast, without losing balance or awareness of orientation to body position [1]. Sopa and Szabo tries to infer the definition of precise agility - "rapid movement of the whole body with changes in speed or direction in stimuli that come from the surrounding environment." It can be interpreted that the

definition of agility in general is "rapid movement of the whole body with the direction of running based on the arrival of stimulus [2] In realizing good footwork it is believed that agility plays a dominant role. Every child who has good agility will easily complete the task of motion optimally including doing footwork.

Coordination is an important factor that will later affect the basic movement skills possessed by children as well as at the level of higher education. Coordination is a reciprocal relationship between the central nervous system with the means of motion in regulating and controlling the impulses and work of muscles for the implementation of a movement [18]. It can be understood that coordination is a cooperative relationship between the arrangement of the central nervous system and the locomotor when contracting in completing motor tasks or interrelated motions. The motion will produce precise and directed movement skills including effective and efficient realization of footwork for elementary school students.

Basic motion must be performed on children, adolescents and adults as the main process that will affect the ability of physical activity [3]. The results of observations made by the authors through the results of the practical tests in the Athletics courses in the July-December 2018 semester and the January-July 2019 semester, showed no more than 10% of all students taking the test got good scores. Researchers assume that students' basic mobility is still far from the good category. The experts said that basic mobility is the initial foundation students must master to do more complex sports movements. Thus, if basic movements are taught to students, of course complex sports movements will also be mastered well. In this study the authors will see how well the footwork ability of elementary school students aged 8 to 10 years, then look at the contribution of agility and coordination that students have on footwork skills.

II. FOOTWORK ABILITY, AGILITY, AND COORDINATION

A. Footwork Ability

Footwork is a basic foundation that is very important for every child to be able to play tennis games easily. When a ball is given or comes towards a player if it has good footwork, the player will always be in a comfortable zone

when hitting the ball. Because in sports games the situation and condition of the ball coming is unpredictable in which direction and how fast the ball is coming. Footwork is a basic motion to produce quality blows, that is, if done in a good position [4]. In the attitude and position of standing on the field must be such that with a good and perfect attitude, it can quickly move to all corners of the playing field. To be able to hit with a good position, a student must have a speed of movement ". Footwork speed cannot be achieved if the footwork is irregular.

B. Agility

Agility is the dominant physical element in the realization of locomotor motion, having good agility will easily complete the movement effectively. Footwork ability includes locomotor motion that must be mastered well by every child. "Agility has more recently been defined as "a rapid whole-body movement with change of velocity or direction in response to a stimulus" [11][12]. Earlier opinions explained that recent agility was defined as rapid movement of the whole body with changes in speed or direction in response to stimuli. Agility has traditionally been defined as the ability to change direction rapidly and accurately [13][14][15][16]. Understandably, agility is simply defined as the ability to change directions quickly and accurately, in realizing locomotor motion [17]. Likewise in realizing footwork, good agility is needed by a child.

C. Coordination

Coordination is a physical element that is very dominant role in learning movement, the realization of movement to see the quality of one's movements in daily activities and in sports. The level of coordination of basic motion is an important factor that drives a child's physical activity from an early age [5]. Based on the results of research that, with the increasing complexity of the movement, the level of coordination required to carry out activities also increases, and coordinating skills are classified as motor learning, motor scouting, motor adaptation and change direction skills [6]. It can be understood that coordination plays a role in increasing the complexity of the movement, and therefore the ability of coordination needs to be improved continuously.

The ability to coordinate strongly supports the mastery of movement skills. Coordination includes eyes, feet, eyes, hands, feet, eyes and so on [7]. Understandably coordination is a cooperative relationship between the central nervous system and the locomotor when contracting in completing motor tasks or interrelated motions. The motion will produce precise and directed motion skills including in realizing locomotor motion effectively and efficiently.

III. THE DATA ACQUISITION SETUP

The instrument used to obtain data on the coordination of the variable hand eye Coordination using the Cable Jump instrument performed for 30 seconds and counted the number

of successful jumps they were able to do [8]. The Balance Variable uses the One-Food Stand test instrument, [9], which requires students to stand for 30 seconds for their right-left feet and counted using a stopwatch. Footwork ability uses the instrument mobility test at the ITN tennis test issued by the world tennis federation [10]. Each child will be given the opportunity 2 times to make the same movement, the movement will be documented in video form. In collecting data there are several tools used, including; (1) meter (2), stopwatch (3), handycame (4), cone (5), whistle (6) skipping.



picture 1. Meteran



Picture 2. Stopwatch



Picture 3. Handycame



Picture 4. Disc cones



Picture 5. Peluit



Picture 6. skipping

IV. THE DATASET

Data on the ability of footwork students in the Koto Tangah District of Padang City were taken 2 repetitions for each child. All capability data in Koto Tangah Subdistrict, Padang City, are captured and then captured in the form of videos and photos to determine students' footwork skills in Koto Tangah Subdistrict, Padang City. Student coordination is obtained by conducting tests which are guided by the Cable Jump instrument [8]. In this test requires each student to run a test of agility running on the field in the form of the letter T. The value taken is the highest value of the 2 repetitions. The time is calculated with the help of a stopwatch to be more effective and efficient.

Balance is obtained by giving the One-Food Stand test, [9], in which each child is asked to stand 1 foot alternately right and left for 30 seconds each. All tests are given to children aged 7 to 10 years consisting of 107 female students and male students.

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual (X1-Y)	Unstandardized Residual (X1-Y)
N		107	107
Normal Parameters ^{a,b}	Mean	.0000000	.0000000
	Std. Deviation	8.77010642	8.44611825
	Most Extreme Differences		
	Absolute	.069	.058
	Positive	.069	.049
	Negative	-.068	-.058
Test Statistic		.069	.058
Asymp. Sig. (2-tailed)		.200 ^{c,d}	.200 ^{c,d}

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

Table 1. Normality Test Data between Footwork Skills and Student Agility and Coordination in the Koto Tengah District of Padang

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.481 ^a	.231	.224	8.81177

- a. Predictors: (Constant), Kelincahan
- b. Dependent Variable: Footwork

Table 2. Contribution of Agility to Students' Footwork Capabilities in Koto Tengah District, Padang City

The above output shows that the Rsquare for the agility variable on the footwork ability level is 0.094 or contributes 9.4%.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.535 ^a	.287	.280	8.48624

- a. Predictors: (Constant), Koordinasi
- b. Dependent Variable: Footwork

Table 3. Contribution of Coordination to Students' Footwork Capabilities in Koto Tengah District, Padang City

While the Rsquare value for the coordination variable on footwork ability is 0.287 or contributes 28.7%.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.624 ^a	.389	.377	7.89241

- a. Predictors: (Constant), Koordinasi, Kelincahan

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4122.223	2	2061.112	33.089	.000 ^b
	Residual	6478.178	104	62.290		
	Total	10600.401	106			

- a. Dependent Variable: Footwork
- b. Predictors: (Constant), Koordinasi, Kelincahan

Table 4. Simultaneous Test of Coordination and Balance Data on Student Footwork Ability Level in Koto Tengah District, Padang City

The output above explains based on the F test or the simultaneous influence between balance and coordination on the footwork ability of elementary school students in the Koto

Tengah District of Padang, the Sig F value of 0.000 < 0.05.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.944	4.753		2.513	.014
	Kelincahan	.339	.081	.339	4.171	.000
	Koordinasi	.422	.081	.422	5.185	.000

- a. Dependent Variable: Footwork

Table 5. Data Capability of Student Footwork in the Koto Tengah District of Padang City.

Based on the output above, the balance and coordination Sig values are 0,000 and 0,000 less than the probability value of 0.05, thus proving that there is an effect of agility and coordination on the footwork ability of students in the Koto Tengah District of Padang City. Data analysis conducted with SPSS version 23 shows the value of $Y = 11.94 + 0.339X1 + 0.422X2$, this means that every increase of one score on balance (0.339X1) and coordination (0.422X2) will increase the ability of footwork at a constant of 11.94.



Picture 7 : Coordination Test



Picture 8 : Coordination 8



Picture 9 : Agility 9



Picture 10 : Agility Illustration

V. CONCLUSIONS

The results of this study indicate that the ability of footwork is influenced by agility and balance. The better the degree of agility and balance, the child's footwork ability tends to be better. In the future, teachers are expected to pay more attention to basic movement skills, especially the ability of footwork that students have to fit their age level. The things that are considered necessary for the ability of footwork also need to be considered such as agility and balance. In the future we plan to apply the Physical and Physical Education learning model which is oriented to basic movement skills

especially footwork abilities. Research related to the ability of footwork also needs to be done further with a larger sample.

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