Contribution of Intelligence and Physical Condition on the Punch and Kick Pencak Silat

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Abstract: This study aims to determine the effect of intelligence, eye-hand-leg coordination, as well as the balance towards the coordination of pencak silat kicks and punches on the students as members of the Pencak Silat Student Club of University of Islam 45 Bekasi. The research method is a survey, and the analysis technique is path analysis. The sampling technique used is total sampling of 30 people. The instruments used are a test of pencak silat kick and punch coordination, intelligence test with IST (Intelligenz Structure Test), test of eye-hand-leg coordination, and test of balance by using modified bass test of dynamic balance. The conclusions are: (1) Intelligence directly affects the coordination of pencak silat kick and punch, (2) Eye-hand-leg coordination directly affects the coordination of pencak silat kick and punch, (3) Balance does not directly affect the coordination of pencak silat kick and punch, (4) Intelligence directly affects the balance, (5) Eye-hand-leg coordination directly effects the balance, (6) Intelligence directly affects the eye-hand-leg coordination.

1 INTRODUCTION

Pencak Silat is the original culture of Indonesia and currently continues to grow up, both in the regulation and organization. Pencak silat organization in Indonesia is called as the Ikatan Pencak Silat Seluruh Indonesia (Indonesian Pencak Silat Association), which is abbreviated into IPSI. It was initiated by Mr. Wongsonegoro and inaugurated on May 18, 1948 in Surakarta with the aim to unite and foster all pencak silat institutions that exist in Indonesia.

Efforts to foster and develop pencak silat are organized through various ways, such as through formal education from primary school to college. In the Faculty of Education, University of Islam 45 Bekasi, pencak silat coaching is conducted inside and outside the lecturing hours. In the curriculum, pencak silat is determined as one of the compulsory subjects in the community life (MBB), while the activities of sport coaching which is done outside the lecturing hours are well known as student club or Unit Kegiatan Mahasiswa (UKM). UKM pencak silat is a place for students to develop their interests, talents and expertise in pencak silat.

UKM pencak silat is designed with the orientation of skill mastery and performance improvement. The exercise program developed in the UKM pencak silat consists of the improvement of physical condition and technique at the match category, the category of single, double and team. One of the skills that are trained to the students as members of UKM pencak silat of University of Islam 45 Bekasi is attacking skill using hand (punch) and leg (kick).

In the effort to obtain the excellent score at the pencak silat match, it needs to be trained attack motor coordination alternately. It is intended that the attacks carried out will effectively on time and obtain high score (Mulyana, 2013). In a pencak silat match, an assessment of the attack with legs that go on target, without being obstructed by blocks, avoidance or evasion, then the opponent scored two, while the attack with a hand that goes on the target, without being obstructed by blocks, avoidance or evasion, then the opponent scored one.

The problem that emerge in training pencak silat kick and punch coordination is the lack of factors that are known to be able to support and should be improved to support these skills, such as: hand-eye-leg coordination as well as balance (These two fitness components are presumed to be very influential in improving the coordination of attack (Schmidt, 2000 & Nuraini, 2014). In addition to a fitness component, intelligence factor is presumed to

also affect motor coordination and ability to recall (memory) (Edwards, 2011).

Based research Van Fels, et al about the relationship between motor skill and cognitive skills in 4 – 16 years old typically developing children: a systematic review, the result is there was either no correlation in the literature, or insufficient evidence for or against many correlation between motor skills and cognitive skills. However, weak to strong evidence was found for same correlation between underlying categories of motor and cognitive skills, including complex motor skills and higer order cognitive skills. Furthermore, a stronger relationship between underlying categories of motor and cognitive skills was found in pre-pubertal children compart to pubertal children (older than 13 years).

The difference result of previously-related research and this study is sample of research in intelligence and coordination variable on the pencak silat kick and punch coordination with sample as members of the Pencak Silat Student Club of University of Islam 45 Bekasi (19 – 23 years old).

Based on the above explanation and previously-related research result, this study aims to determine the effect of intelligence, eye-hand-leg coordination and balance towards pencak silat kick and punch coordination.

2 METHODS

The method used in this study was survey method with measurement techniques and tests. The analysis technique used was path analysis. The study was conducted at the University of Islam 45 Bekasi, Jl. Cut Meutia No. 83 Bekasi. The population in this study was the pencak silat club athletes of University of Islam 45 Bekasi with the total of 30 students. The sampling technique used was total sampling, in which the entire population becomes the sample of the study. Therefore, there were 30 people as samples in this study.

The instruments used were a test of pencak silat kick and punch coordination (Lubis, 2014), intelligence test with IST (Intelligenz Structure Test), test of eye-hand-leg coordination (Abidin, 2015) and a balance test by using modified bass test of dynamic balance (Widiastuti, 2015).

3 RESULTS AND DISCUSSION

Descriptive statistics calculation results can be seen in the table below:

Table 1: Descriptive Statistics Calculation Result.

Descriptive Statistics						
Variables	N	Min	Max	Mean	Std. Deviation	Variance
Intelligence	30	80	113	92.57	8.076	65.220
Eye-Hand-Leg Coordination	30	14	36	25.00	5.382	28.966
Balance	30	25	50	40.33	7.871	61.954
Pencak Silat Kick and Punch	30	23	55	40.50	9.108	82.948
Valid N (listwise)	30					

Table 2: Result Summary of Structural Test 1.

Direct Effect inter Variables	Path Coefficient	t-cal	p-value	Conclusion
X_1 on X_2 ($_{21}$)	0.780	6.593	0.000	Significant

Table 3: Result Summary of Structural Test 2.

Direct Effect inter Variables	Path Coefficient	t-cal	p-value	Conclusion	Remarks
X_1 on X_3 ($_{31}$)	0.464	2.960	0.006	Significant	$\varepsilon = 0.509$
X_2 on X_3 ($_{32}$)	0.448	2.861	0.008	Significant	

Table 4: Result Summary of Structural Test 3 before Trimming.

Direct Effect inter Variables	Path Coefficient	t-cal	p-value	Conclusion	Remarks
X_1 on Y ($_{y1}$)	0.331	1.892	0.070	Significant	$\varepsilon = 0.48$
X_2 on Y ($_{y2}$)	0.494	2.845	0.009	Significant	
X_3 on Y ($_{y3}$)	0.107	0.574	0.571	Insignificant	

Based on the analysis presented in the table 1, table 2, table 3, table 4, there is a path coefficient is not significant, that is the path coefficient X3 on Y

(y3) = 0.107 so that the model needs to be fixed by removing X3 from the model which is commonly called as trimming.

Trimming model is a model that is used to fix a path analysis structure by removing the exogenous variables of the model which the path coefficient is insignificant. The result of trimming makes the result of the third structural change.

For the final result of the structural 3 calculation after trimming can be seen in Table 5 below:

Table 5: Result Summary of Structural Test 3 after Trimming.

Direct Effect Inter Variables	Path Coefficient	t-cal	p-value	Conclusion	Remarks
X_1 on Y ($_{y1}$)	0.381	2.536	0.017	Significant	$\varepsilon = 0.4$
X_2 on Y ($_{y2}$)	0.542	3.608	0.001	Significant	

The next step is testing the model compatibility with the sample size (n) = 30, and the number of path coefficient which is not significant (d) = 1, then the chi-square statistic test with W = - (n-d) ln Q = -(30-1) in (1.000313) = 0.009, from chi square table with df = d = 1, at a significance level of = 0.05 obtained tab = (0,05;1) = 3,84.

Because W = 0.009 < 3.84, then H0 is accepted. Thus, the model obtained is appropriate or suitable (model fit) with the data.

Based on the results of data processing research, can be described model of constellation path analysis (the causal model between variables X1, X2, and X3 to Y). As for the image of the constellation path analysis model can be seen in the picture below:
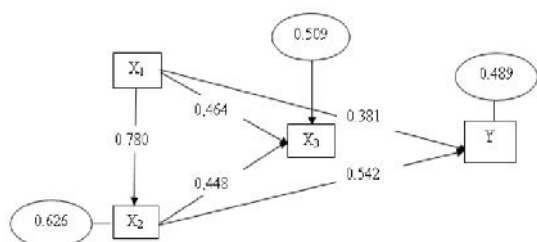
Figures 1: Causal Models of Variable X1, X2, X3 to Y.

Based on the above explanation and previously-related research result, Irene M.J. Van Fels, Sanne C.M te Wierike, et al about the relationship between motor skill and cognitive skills in 4 – 16 years old typically developing children. The result of this review are interesting in the contex of training programs focusing of optimizing motor and/or cognitive skills in children, as it would support the concept that intervention in one domain (motor or cognitive skill). Complex motor skills, coordination of movement in rhytm, and sequenced movements should be included in motor intervention programs to improve higer order cognitive skills or vice versa (Magill, 2011).

The results of data processing and analysis in my research, the conclusions of this study are as follows: (1) Intelligence directly affects the coordination of pencak silat kick and punch, (2) Eye-hand-leg coordination directly affects the coordination of pencak silat kick and punch, (3) Balance does not directly affect the coordination of pencak silat kick and punch, (4) Intelligence directly affects the balance (Haqiyah, 2016), (5) Eye-hand-leg coordination directly effects the balance, (6) Intelligence directly affects the eye-hand-leg coordination.

4 CONCLUSIONS

Based on the results of data processing and analysis, the conclusions of this study about pencak silat kick and punch coordination, intelligence and eye-hand-leg coordination directly affects the coordination of pencak silat kick and punch, while balance does not directly effect the coordination of pencak silat kick and punch. Intelligence and eye-hand-leg coordination directly effects on intervening variables (balance) and intelligence directly affects the eye-hand-leg coordination.

Some suggestions to be given with respect to the results of this study are for lecturers, coaches, trainers, and physical education teachers, the results of this study can be used as a reference and information in the search for talented pencak silat athletes on the match category based on the level of intelligence and good physical condition.

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