

Model of Physical Condition of Leg Muscle Explosive Power, Nutrition Status and Confidence Towards Skill Smash Sepaktakraw

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Abstract

In the year 2012 Riau PON DKI takraw team in Jakarta is included in the top 5, and in 2016 Bandung West Java PON sepak takraw team is not included in the top 5, this shows that the performance of DKI Jakarta takraw football team has decreased. Based on this background path analysis study aimed to obtain information on the influence of the physical condition of leg muscle explosive power, nutrition status and self-confidence towards skill smash sepaktakraw at the athlete's of DKI Jakarta, Indonesia. The method used is a quantitative approach, survey and test methods (vertical jump, BMI and questionnaire). The subjects in this study were DKI Jakarta athletes as many as 30 people. Sampling is done using the technique Total Sampling. Based on testing the hypothesis, the results of this study are that there is a positive influence between explosive power limb muscle on skills smash sepak takraw DKI Jakarta athletes 8.52%. There is a positive influence between nutritional status with skills smash sepak takraw DKI Jakarta athletes is 8.4%. There is a positive influence between confidence and Skills Smash sepak takraw DKI Jakarta athletes by 10.0%. There is a positive influence between e-limb power muscle with the confidence of DKI Jakarta athletes at 38.4%. There is a positive influence between nutritional status and the confidence of DKI Jakarta athletes 6.4%. There is a positive influence between explosive power limb muscle and nutritional status in DKI Jakarta athletes by 31.5%.

The conclusion is that there is a significant effect of explosive limb muscle power, nutritional status and confidence in the DKI Jakarta athlete's smash skills on PON championship achievements.

Keywords

Explosive Power of Leg Muscle, Nutritional Status, Confidence, and Skill Smash Sepaktakraw

1. Introduction

Development sporting achievement is part of improving the quality and quantity of human beings, in addition, it also can cultivate character, personality, sportsmanship and the ability of pikir and development sports skills, therefore the development of sports must be observed at this time in fostering and development in the future, because sports can elevate the degree and make the nation proud on the regional and international stage (N. A. Kosni *et al.* 2018). The name of the nation on national and international stage is very closely related to sports achievements. Sport Achievement is a sports activity that is pursued and managed professionally with the aim of obtaining optimal performance in each particular sport. This is in accordance with the mandate that is written in the Law No. 3 of 2005 on the system national sports republic of Indonesia in chapter 1 verse 13 explains, "Sports achievement is a sport that foster and develop the sportsman in a planned, hierarchical and continuous through the competition for achievement with the support of sports science and technology " (Presiden Republik Indonesia 2005). In connection with that, in fostering and developing sportsmen in a planned, tiered and sustainable manner, sports achievements also instill positive social values and can instill the characteristics of high sportsmanship. So therefore from several branches of sports achievements that can be a branch of sports sepak takraw (Jufrianis, Akbar and Tangkudung 2019). Sport Sepaktakraw is a game that is played on a rectangular field with a flat surface, both indoors (outdoors) and outdoors (outdoor), provided that it is free from obstacles (Achmad sofyan hanif 2015). This game starts with doing football (service) carried out by tekong towards the opponent's field, then the opposing player plays the ball using legs or other body parts except the hand, with three touches. And to play the sepak takraw game is also supported by several factors, two factors including: (1) Mastery of the technique of playing sepak takraw individually, (2) Good teamwork. The more perfect mastery of each player's technique and teamwork, the better the quality of the game. In order for the game to run well, mastering basic techniques in sepak takraw skills is very necessary (N. A. Kosni *et al.* 2017). Divides skills in sepak takraw such as individual basic engineering skills and match mastery skills. Individual basic engineering skills include: sila football, soccer pry, guess football, soccer, cross,comprehend, heading (heading), menthe chest and shoulder (I. H. Sujae, K. C. Gon, and M. K. T. Hin 2017) (H. Zainudin 2013). The mastery skills of sepak takraw games include, serving, giving bait, doing smashes, and blocks. Among the skills of mastering the game above that must be mastered in carrying out attacks to get points (numbers) during the match are skills Smash. Smash in sepak takraw game aims to produce numbers and wins in matches. Smash is an attempt by an athlete or player to carry out an attack on an opponent's area. Smash is a dynamic movement and varied to get numbers or points in attacking in the sepak takraw game, so in doing a smash it requires optimal physical ability to perform full skills smash , fast and accurate so that it can get good results. In performing smashes athletes must have a complex range of movements and be supported by good physical condition components (I. H. Sujae and M. Koh 2008). The components of physical condition that are indispensable in carrying out physical explosive power limb muscle, according to Tudor O. Bomp and Carlo Buzzichelli Power is a product of two abilities of strength and speed and is the ability to apply the highest force in the shortest time (T. Bomp and C. Buzzichelli 2014). Unlike powerlifting, athletes in all other sports face time are constrained as applying as much force as possible and according to James Tangkudung explored power in limb muscle the ability of one's limb muscles to explosive (jump) as high as possible, therefore when the sepak takraw athlete has a very high jump, it will make it easier to do smash a very good, so according to the theory above an athlete must have the ability to explosive power limb muscle is very good, so that sepak takraw smasher in doing a smash well and directed (J. dan wahyuningtyas puspitorin Tangkudung 2012). In addition to the components of the physical condition needed, the health aspects of athletes such as the athlete's nutritional status, because of the human energy source to increase the body's resistance from healthy and highly nutritious foods, therefore an athlete must have a good and balanced nutritional status. Nutritional status is an expression of the state of balance in the form of certain variables or it can be said that nutritional status is an indicator of the poor good provision of daily food, so good nutritional status is needed to maintain fitness and health degrees. help growth for human growth and support the athletes' achievement in competition (Djoko Pekik Irianto 2007) (L. Costello, M. Chapman, A. Deane, K. Lange, and D. Heyland 2015). Furthermore, allegations that strongly influence after the physical component and nutritional status of athletes are athletic psychology abilities such as self-confidence. The belief that one has internal resources, particularly abilities, to achieve success (B. Strand, S. David, K. J. Lyman, and J. M. Albrecht 2017) (L. Norman 2014). Confidence and expectations, and although there are multiple definitions of self-confidence, they all refer to

individuals' beliefs about their abilities and or their expectations about achieving success based on these abilities (Y. Imas, O. Borysova, I. Kogut, Y. Maksym, V. Marynych, and O. Shlonska 2018), and Self-confidence is a person's belief in everything he has and that belief makes him feel able to achieve various goals in his life, so that's why when sepak takraw athletes already have very good skills, when in the match takes place with a high self-confidence mentality that really helps athletes to achieve their desired goals (Prof.Dr.dr.James Tangkudung, SportMedicine 2018)

2. Methodology

This research is a quantitative approach, a survey method with test and measurement techniques. While the analysis technique uses the path analysis approach path analysis (Riduwan, engkos achmad kuncoro 2012) analysis technique using the path analysis approach (path analysis) that is research that will examine or will analyze the interrelationship between research variables by measuring the direct influence between endogenous variables (variables bound) is Y with exogenous (free) is X_1 , X_2 and X_3 .

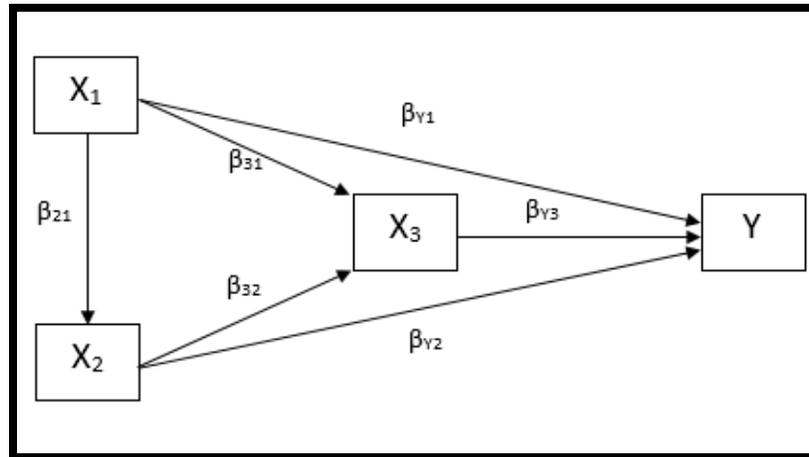


Figure 1: the constellation of causal between variables x_1 , x_2 , x_3 , and Y
Source: Ridwan, Engkos achmad kuncoro, How to Use and Interpret Path Analysis , (Bandung: Alfabeta, 2012), p. 6

Description:

- X^1 : Explosive Power of Leg Muscles
- X^2 : Nutritional Status
- X^3 : Confidence
- Y : Skills Smash

This study involves three independent variables (exogenous) and one dependent variable (endogenous), exogenous variables consist of: Explosive Power Leg Muscle (Vertical Jump Test), Nutritional Status with (BMI Test) and Confidence with the questionnaire test. endogenous namely results Smash in DKI Jakarta-Indonesia athletes (skill test smash Sepak takraw) with a population and a sample of 30 DKI Jakarta-Indonesia athletes using total sampling technique according to (Suharsimi Arikunto 2013).

3. Result and Discussion

The results of the statistical analysis showed that the Model-1, Model-2 and Model-3 Hypotheses: Explosive Power of the leg muscles, nutritional status and self-confidence simultaneously influence skills smash.

Structure of Model-1:



Rules for testing significance indicated by the following data:

Table 1. Model-1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.188 ^a	.491	.001	9.996

a. Predictors: (Constant), Explosive power leg muscle

appears that the coefficient of determination for model 1 (R^2) of 0.491 means that 3.5% of the variability of the nutritional status variables can be explained by variabel Explosive Power of leg muscles. So that $\epsilon = \sqrt{1 - R^2} = \sqrt{1 - 0.491} = 0.982$

Table 2. Model-1ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	102,021	1	102,021	1,021	.021 ^b
Residual	2797,860	28	99,924		
Total	2899,880	29			

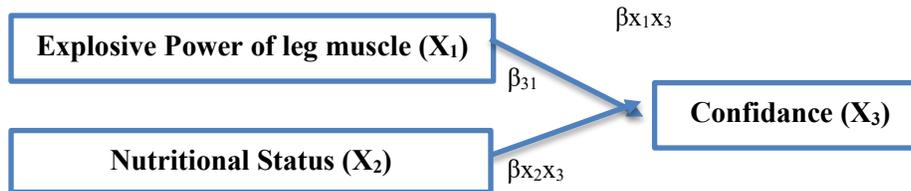
a. Dependent Variable: Nutritional Status

b. Predictors: (Constant), Explosive power of leg muscles

Based on the results of the analysis in the table above, it is found that model 1, $F_o = 1,021$; $db_1 = 1$ $db_2 = 28$, p -value = 0.021 < 0.05 or H_o is rejected. Thus, the variable Explosive Power of leg muscles simultaneously influences the nutritional status.

Hypothesis Model-2: Explosive power leg muscle and nutritional status have an effect on simultaneously on skills smash sepak takraw.

Model-2 structure:



Rules for testing significance indicated by the following data below:

Table 3. Model-2

Model	R	RSquare	Adjusted R Square	Std. Error of the Estimate
1.	.505 ^a	.255	.200	8.944

a. Predictors: (Constant), Nutritional Status and Explosive power leg muscle

appears that the coefficient of determination for the model-2 (R^2) of 0.255 means that 25.5% Confident variable variability can be explained by the variable Explosive Power of leg muscle and nutritional status . So that $\epsilon = \sqrt{1 - R^2} = \sqrt{1 - 0.255} = 0.863$.

Table 4. Model-2 ANOVA^b

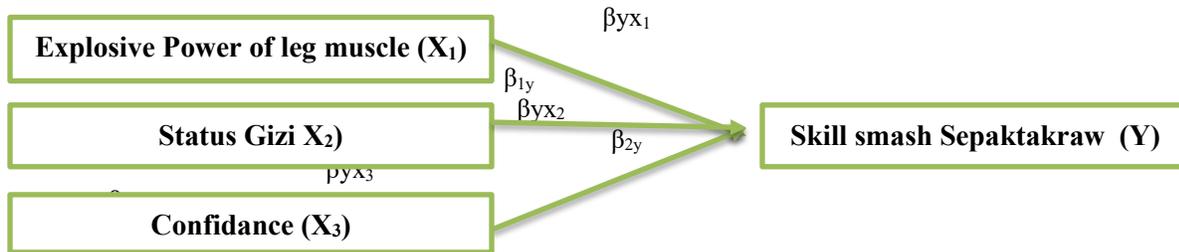
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	740,174	2	370,087	4,626	.019 ^b
Residual	2159,990	27	80,000		
Total	2900,164	29			

a. Dependent Variable: Confidance

b. Predictors: (Constant), nutritional status, Explosive power of leg muscles

Based on the results of the analysis in the table above, it is found that model 1, $F_o = 4,626$; $db1 = 2$ $db2 = 27$, p -value = $0.019 < 0.05$ or H_0 is rejected. This, variable Explosive power of leg muscle and nutritional status simultaneously influence Confidence.

Hypothesis: Explosive Power of leg muscles and Nutritional Status simultaneously influence Confidence.
Model-3 structure:



The rules for testing significance are indicated by the following data below:

Table 5. Model-3

Model	R	RSquare Square	Adjusted R Square	Std. Error of the Estimate
1	.711 _a	.505	.448	6328

a. Predictors: (Constant), Confidence, nutritional status, Explosive power leg muscle

appears that koefisien determination for model 1 (R^2) of 0.505 means that 50.5% of variability variable Skills smash sepak takraw kedeng can be explained by the variable Explosive Power leg muscles, nutritional status and confidence. So that $\epsilon = \sqrt{1 - R^2} = \sqrt{1 - 0.505} = 0.703$.

Table 6. Model-3 ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1063,823	3	354,608	8,854	.000 ^b
1 Residual	1041,262	26	40,049		
Total	2105,085	29			

a. Dependent Variable: skills smash Sepak takraw

b. Predictors: (Constant), Confident, Nutritional Status, Explosive power of leg muscles

Based on the results of the analysis in the table above, it is found that model 1, $F_o = 8.854$; $db1 = 3$ $db2 = 26$, p -value = $0,000 < 0.05$ or H_0 is rejected. Thus, the Variable Explosive Power of Leg Muscles, Nutritional Status and Confidence simultaneously affect the Skills Smash Sepak Takraw Kediri.

4. Discussion

purpose of this study was to determine the direct effect of explosive limb muscle power, nutritional status and confidence in sepak takraw smash skills. The findings of this study reveal that there is a positive influence between explosive power of leg muscle on smash skills, there is a positive influence between nutritional status to smash skills, there is a positive influence of confidence in sepak takraw smash skills. Based on the results of testing of all hypotheses that have been carried out in the hypothesis testing section, it can be stated that:

First, the hypothesis there is a significant effect explosive power of limb muscle, nutritional status and confidence in skills smash kedeng sepak takraw after testing hypotheses together significant also when the individual tests are also significant. Based on the results of individual hypothesis testing it turns out that explosive power limb muscle, nutritional status and confidence have a significant effect on skills smash sepak takraw in DKI Jakarta athletes. Structural equation from the results of path analysis from explosive power limb muscle, Nutritional Status and confidence in skills smash sepak takraw are as follows: $Y = 0.292 \rho_{1y} + 0.604\rho_{2y} + 0.484\rho_{3y} + 0.703 \epsilon_3$. Effect of variable explosive power limb muscle(X_1) on skills smash sepak takraw (Y) directly amounting to $0.292^2 \times 100\% = 0.0852$ or 8.52%. Nutritional Status Variable (X_2) towards skills smash sepak takraw(Y) has a direct influence of

$0.604^2 \times 100\% = 0.3648$ or 36.48%. While the variable of confidence (X_3) towards skills smash sepak takraw (Y) has a direct effect of $0.4842 \times 100\% = 0.2342$ or 23.42%. From the description above it can be seen how much influence the variable explosive power limb muscle, Nutritional Status and confidence in skills smash sepak takraw, it can be concluded that the variables X_1 , X_2 , and X_3 have a direct effect on variable Y, this refers to the research conducted by Pano, Sirajudin says there are influences significantly exercise leg muscle power towards sepak takraw smash abilities (Aristoteles 2002).

Second, the hypothesis there is a significant effect of explosive power limb muscle and nutritional status on self-confidence after hypothesis testing has been proven to be individually influential on skills smash sepak takraw in DKI Jakarta athletes. Structural equation from the results of path analysis from explosive power limb muscle to confidence and Nutritional Status to confidence is $X_3 = 0.334 \rho_{31} + 0.321 \rho_{32} + 0.863 \varepsilon_2$. The effect of variable explosive power limb muscle directly on self confidence is $0.334^2 \times 100\% = 0.1115$ or 11.15%. Nutritional status directly influences self-confidence of $0.321^2 \times 100\% = 0.1030$ or 10.30%. from this description it can be seen the effect of variable explosive power limb muscle and nutritional status directly towards self-confidence the rest is the influence of other variables apart from the variable explosive power of leg muscle and flexibility of the hip joint. Other variables that can influence self-confidence include internal factors including the caring of athletes, past experiences, ideals and expectations (Jufrianis 2017). While external factors include available facilities, facilities and infrastructure, training programs and the environment, this refers to a study conducted by Sujarwo saying the positive effect of capacity of the function, Nutritional Status, Physical Activity and Exercise Motivation towards Physical Fitness on the athlete KONI Depok City (Sujarwo 2018).

Third, the hypothesis is that there is a significant effect of explosive limb muscles on flexibility of the hip joint. after testing hypotheses it was proven individually to have a significant effect on Nutritional Status DKI Jakarta Athletes. Structural equation from the results of path analysis from explosive power limb muscle to Nutritional Status is $X_2 = 0.188 \rho_{21} + 0.982 \varepsilon_1$. The effect of the leg muscle power variable directly on the size of $0.188^2 \times 100\% = 0.0353$ or 3.53%. From this description it can be seen that the effect of variables explosive power limb muscle directly on Nutritional Status is the influence of other variables other than the variable explosive power of limb muscle. Other variables that can affect flexibility are exercise and other biomotor factors. From the results of the description above, we can see the results of the research on the effect of explosive power limb muscle, Nutritional Status and achievement self-confidence skills smash on sepak takraw kedeng in DKI Jakarta athletes. This finding shows that to improve the achievement of sepak takraw athletes, an athlete must have explosive power limb muscle, Nutritional Status and of course good self-confidence, where all three have an influence in improving the achievements of DKI Jakarta athletes going forward (P. D.B., V. E.A., and M. M 2014).

5. Conclusion

Based on the calculation of path analysis of such structures, the result of hypothesis analysis model line-1, model 2 and model-3 provide information objektif some direct influence on the effect of eksplosive power leg muscle (X_1), nutritional status (X_2) and confidence (X_3) towards skills smash sepak takraw. (Y) which can be seen as follows:

- Direct effect of variable X_1 on Y ($X_1 \rightarrow Y$) or (r_{1y}) = 0.292. So the effect explosive power of limb muscle (X_1) directly affects skills smash sepak takraw's (Y) of $0.035^2 \times 100\% = 0.0982$ or 9.82%.
- The direct effect of variable X_2 on Y ($X_2 \rightarrow Y$) or (r_{2y}) = 0.604. So the influence of Nutritional Status (X_2) directly affects the affect of skills smash sepak takraw (Y) of $0.505^2 \times 100\% = 0.0703$ or 7.03%.
- The direct effect of variable X_3 on Y ($X_3 \rightarrow Y$) or (r_{3y}) = 0.484. So the effect of self-confidence (X_3) directly affects the affect of skills smash sepak takraw's (Y) of $0.484^2 \times 100\% = 0.2342$ or 23.42%.
- The direct effect of variable X_1 on X_3 ($X_1 \rightarrow X_3$) or (r_{12}) = 0.434. So the explosive effect of limb muscle power (X_1) directly affects self-confidence (X_3) of $0.434^2 \times 100\% = 0.868$ or 8.68%.
- The direct effect of variable X_2 on X_3 ($X_2 \rightarrow X_3$) or (r_{23}) = 0.3521. So the effect of nutritional status (X_2) directly affects self-confidence (X_3) of $0.3521^2 \times 100\% = 0.642$ or 6.42%.
- The direct effect of variable X_1 on X_2 ($X_1 \rightarrow X_2$) or (r_{13}) = 0.1188. So the explosive effect of limb muscle power (X_1) directly affects the nutritional status (X_2) of $0.1188^2 \times 100\% = 0.2376$ or 23.76%.

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