

# Prediction of Anthropometric Influence on the Volleyball Playing Skills

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**Abstract**—This study aimed to test the predictions of anthropometric variability with game performance assessment instrument on volleyball player. This research using descriptive correlation with participants as many as 35 athletes, aged between 20-22 years from three universities club in West Java Indonesia. The instrument use the anthropometric test and a test of skill to play volleyball with using GPAI. Analysis of the data in this study using a simple correlation analysis, simple regression. Results of the analysis showed that the correlation between anthropometric game significant performance with a correlation coefficient of 0.69 and significant at  $\alpha = 0.00$ . These results prove that the contribution of anthropometric variability of 49% to the improvement of skills to play volleyball. Regression model equations obtained is  $y = 14,275 + 0.742 \text{ Antrometrik}$ . The equation illustrates that increasing the skills of playing volleyball variable predicted by anthropometric variables at 0.742.

**Keywords**—*anthropometric; appearance playing volleyball; GPAI test*

## I. INTRODUCTION

The volleyball game is a sport that is favored in all parts of the country, as well as in Indonesia, which has competed at amateur and professional level. In line with the development of this game, the best performance is the desire for team athletes and coaches, but to achieve it is not easy to make it happen. Need to do a field study of sports achievement in the sport of volleyball.

Scouting program giftedness and gifted athletes seedling development in advanced countries achievements have been implemented with the support of adequate resources [1], including not only from government and public funds, but support expertise through cross-scientific approach and interdisciplinary. The sophistication in the field of measurement and evaluation, and the discovery of instruments that can be used to predict a person's achievement encourages us to work effectively in identifying and selecting candidates for talented athletes.

Scouting process, recognition and identification of talent is an activity that takes precedence by trainers and specialist training in order to develop and to improve the psychological criteria used to find someone more talented athletes see sports that high. The use of scientific criteria in talent identification process has several advantages as follows: (1)

substantially reduces the time required [2], to achieve the highest ability to choose individuals who are talented in the sport (2) reduce the volume of work and energy to do the coach. the effectiveness of a given workout trainer is usually supported keefektivasannya by the athletes who have the superior ability of the (3) improve the competitive atmosphere and the number of athletes entered, and the attainment of a high capacity, as a result the national team homogenous and stronger for the appearance at the international level (4) increase the confidence of the athlete because the view is better than the other athletes of the same age who do not go through the process of selection (5) indirectly motivate the application of scientific training, assistant sports coach who helps in the introduction of talent motivated to continue to monitor the exercise athlete. Scouting talent (talent identification) is an attempt by systematically to identify someone who has the potential in the sport, it is estimated that the person will be successful workout and can achieve peak performance [3]. Another definition of the talent scouting regarded as an attempt was made to estimate with a high probability of a person's chances of talented in sports achievements to be successful in training programs so as to achieve peak (Affairs in 1998). Talent is the ability of a person buried owned since birth and is the basis of the ability of fact. The division of talent we are familiar with common talents are; the talents of each person, although differing in levels commonly called intelligence. Special talent: the ability that stands out on someone who is not on everyone. While the sporting talent, namely: basic skills with regard to the appearance of motion (motor performance) and is a combination of multiple capabilities with an attitude and a person's body shape. Anthropometric have a role in the search for talent, the steps in the measurement of body basic capability with respect to the appearance of motion (motor performance) and is a combination of multiple capabilities with an attitude and a person's body shape. Anthropometric have a role in the search for talent, the steps in the measurement of body basic capability with respect to the appearance of motion (motor performance) and is a combination of multiple capabilities with an attitude and a person's body shape. Anthropometric have a role in the search for talent, the steps in the measurement of body [4], Anthropometric capacity of a person is important in some sports, and therefore a key consideration in the criteria for the identification of talent. High body mass index and weight or the length of the limbs often

play an important role in certain sports. However in the early stages of talent identification in certain branches. Early stages of talent identification harmonious physical development must be considered. This can be done by anthropometric check the leg joints, hip, shoulder width and the ratio between hip and shoulder width and others.

Sport volleyball is a sport that is very dynamic, characterized by various sprints, jumps (blocking and spiking) and high intensity movements that occur repeatedly during the competition [5], The success of the performance of the structure of this movement depends on anthropometric and physical performance variables [6]. The differences in physical abilities and anthropometric variables makes athletes different levels of performance, regardless of the position, both in volleyball and in other team sports has been investigated in previous studies [7-9].

Anthropometric dimensions play an important role in determining the success of an athlete [10-12]. Quite naturally, interest in anthropometric characteristics and body composition sportsmen from different competitive sports has increased rapidly over the past few decades. It has been established that the characteristics of anthropometric indicate whether the players will be fit for competition at the highest level in certain sports [13]. Anthropometric Parameters This is a sensitive indicator of physical growth and nutritional status of sportsmen for their maximum performance [14]. Indicators sports performance perspective is highly dependent on genetics, correlated with age, gender, socioeconomic status, ethnicity, height, nutritional status, personality and exercises [15]. Proper evaluation of these parameters are projected quantification of morphological characteristics of elite athletes who could be vital in linking structure of the body and the sport performance [15].

Several studies have examined the relationship between the characteristics of anthropometric and physiological volleyball players. The findings of this study have shown that the characteristics of the anthropometric particular advantageous for volleyball players, including larger high, the distance vertical leap greater, the larger mass, upper body strength more large and lower percent body fat [13].

Apart from the availability of literature related to anthropometric parameters in the footballer volli, standardized data on these parameters in the country rarely in the context of Indonesia.

The body can assume various postures, anthropometric always refers to the anatomical position, ie standing with his head and eyes point forward, legs, upper arms hanging on both sides, and the fingers pointing down, and legs simultaneously with the toes pointing forward. Anthropometric data retrieval technique is deceptively simple. However, the development of anthropometric touch rarely achieved without extensive training. Most people seem to achieve reasonable competence after performing repetitive measurements and must have kinantropometry certification. The purpose of this study to examine the relationship between anthropometric variables with performance on puz volleyball game.

**II. METHOD**

In this study, researchers will unveil anthropometric characteristic features on the sport of volleyball, the method used to use Descriptive Correlational.

**A. Participants**

Volleyball athletes from three local student volleyball club West Java N = 35, age 20-22 years. Predicate athletes at PORDA and PON West Java.

**B. Instrument**

Dimensional measurements of the human body using Anthropometric tests include: height, weight, FAT, BMI, leg length, sitting height, arm length, circumference pelvis, arm circumference, shoulder width, Performance testing using a test GPAI play include execution skills, decision making support, the calculation for the test games and game improvement performance.

The statistical analysis used in this study by using a simple correlation analysis. It is assumed because basically consistent with the objectives of this study to examine the relationship between independent variables and the dependent variable.

As the name implies this analysis technique intended to describe data that has been collected without generalizing. In general, quantitative research is seeking research can be generalized however, when the researchers only calculate the applicable data in the studied sample only then, researchers using descriptive statistics.

**III. RESULTS AND DISCUSSION**

The data generated in this study were analyzed using a simple correlation, it is assumed to see how much the value of the correlation coefficient or the relationship between variables, following further analysis results are presented in the table below:

TABLE I. THE RESULTS OF CORRELATION ANALYSIS BETWEEN VARIABLES

Variables	N	Correlation Koefiesien	Significance
Anthropometric * Game Performance	35	0.69	0,00

Based on the analysis significant correlation between anthropometric the game performance with a correlation coefficient of 0.69 and significant at  $\alpha = 0.00$

TABLE II. RESULTS OF REGRESSION MODEL

Model	Coefficients unstandardized		Sig.
	B		
1	(Constant)	14 275	.100
	anthropometric	.742	.000

Based on table 2, the Regression Line Equation is obtained as follows:  $Y = 14, 275 + 0.742$  Antrometrics. The equation illustrates that the increase in y variable is predicted by variable x of 0.742, besides, anthropometric variability contributes 49%

to the increase in volleyball skills and the remaining 51% increase in volleyball is influenced by other factors.

TABLE III. RESULTS BETWEEN VARIABLE REGRESSION EQUATION MODEL

Model		Unstandardized Coefficients	Standardized Coefficients	Sig.
		<i>B</i>	<i>Beta</i>	
1	(Constant)	66.672		.042
	Height	-.041	-.033	.899
	Weight	.022	.022	.946
	<b>Fat</b>	<b>.280</b>	.245	.365
	<b>Rm</b>	<b>.264</b>	.226	.404
	Bmi	-.096	-.086	.766
	Leg length	.095	.079	.753
	Sitting height	-.206	-.184	.491
	Arm length	-.152	-.127	.692
	Pelvic circumference	-.202	-.163	.528
	Arm circumference	.005	.004	.992
	<b>Shoulder width</b>	<b>.165</b>	.129	.598
	Chest size	-.014	-.012	.973

Based on table 3, the Multiple Regression Line Model Equations are obtained as follows :  $Y = 66,672 + 0,41 X1 + 0,22 X2 + 0,280 X3 + 0,280 X4 + 0,264X5 - 0,096 X6 + 0,095 X7 - 0,206 X8 - 0,152 X9 - 0,202 X10 + 0,005 X11 + 0,0165 X12 - 0,014 X13$ . The equation illustrates that the increase in the y variable is predicted by the overall variable X, however, seen from the model equation there are several variables x which can predict the increase in variable y, namely the FAT, RM, and shoulder width variables, these variables are predicted to contribute more greater than the other variables, on increasing b variable y variable.

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