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**Umar**  
Sport Science Postgraduate  
Department, Sebelas Maret  
University, Surakarta, Indonesia

**Muchsini Doewes**  
Sport Science Postgraduate  
Department, Sebelas Maret  
University, Surakarta, Indonesia

**Sapta Kunta Purnama**  
Sport Science Postgraduate  
Department, Sebelas Maret  
University, Surakarta, Indonesia

## Analysis of factors and conditions anthropometry determinant dominant performance athletes futsal

**Umar, Muchsin Doewes and Sapta Kunta Purnama**

### Abstract

After analyzed by using confirmatory factor analysis with KMO and Bartlett's Test, the dominant anthropometric effect on futsal athlete is dominant anthropometry is height, weight, and foot length. While the dominant physical condition factors affect the athletes futsalyaitu thigh muscle strength, speed and agility. Whereas the physical condition factors included in the category of weak or less dominant is the length of the legs, the width of the sole of the foot, the formation of togok, and the coordination of the ankle.

**Keywords:** Anthropometry, Physical Condition, Futsal

### 1. Introduction

Futsal is a sport that resembles football, if in football all athletes usually reach eleven people, whereas in futsal the athletes are only required five people. Basically these two sports have the same rules as football is just football using a vast field using grass on the floor. Unlike sports futsal is often done in a room that has a much narrower diameter when compared with football field. Futsal sport is currently in great demand in Indonesia especially in Surakarta in particular. Evidently, there are many futsal competition which is attended by young people who sit in Junior High School and Senior High School (SMA), but not a few competitions followed by groups of students and all ages. The large number of futsal clubs in Surakarta that are developing today make futsal sport so popular because besides it can be a cheap society entertainment, futsal sport can also be a source of additional income for athletes. Mental coaching and maturity of champions in futsal are as important as technical, physical and tactical coaching. Athletic mental training should be aimed at planting psychological elements that support achievement in sports. Mental coaching and maturity of the champions, can be done through giving understanding to athletes and through various game trials in the team itself as well as trials with other teams. Looking from the biological aspects that include the potential (the basic ability of the body), the function of body organs, structure and posture and nutrition, therein there are elements of physical condition and structure and posture of the attention to maximize achievement. Physical condition is an indispensable prerequisite in efforts to improve the performance of an athlete, even can be said as basic needs that can not be postponed or negotiable. Sajoto (1995: 8) suggests the physical condition in sports that if someone wants to excel Has a physical condition such as strength, endurance, muscular power, speed, coordination, flexibility, agility, balance, reaction, R Height associated with weight and body ideal will be easier to make the movement. The role of weight here can be seen clearly when performing the basic technique movement of futsal sport, so that a high-bodied futsal athlete will reach the distance faster when compared to those who have short body. The futsal game is influenced by the muscle qualities of the athlete. To obtain the maximum results of basic techniques of futsal sports, of course, the length of the legs and also of all the muscle groups that support the movement of basic futsal techniques. Athletes with leg length may not necessarily perform the basic futsal technique, it all depends on the length of the legs that the athlete has. With long legs the athlete can perform the basic technique of futsal well. By knowing the usefulness and purpose of the basic futsal technique, the athletes are expected to understand and then apply it in training and games to a match. One of the internal condition factors is physical ability.

**Correspondence**  
**Bagus aryatama**  
Sport Science Postgraduate  
Department, Sebelas Maret  
University, Surakarta, Indonesia

Physical abilities relate to the length of the leg that affects the appearance of the athlete both in the exercise of skills movements and in the game. Thus it can be said that the length of the leg is a requirement in the effort achievement of maximal achievement for athletes in the improvement of game futsal. Based on the above description is known that anthropometry factors and physical conditions have a very important role and affect the achievement of an athlete's technical achievements. Therefore the need for research by using anthropometry factor and physical condition and its influence to the improvement of basic futsal technique. Based on the background of the problems mentioned above, this study entitled "Analysis of Anthropometric Factor and Physical Condition of the Determinants of Achievement of Futsal Athlete".

## 2. Materials and Methods

This research method is using a quantitative approach, using the design of the Factor Confirmation Analysis (Emzir, 2008: 48). Factor analysis is one multivariate statistical method that attempts to explain the relationship between a number of mutually independent changes with one another so that one or more sets of changes can be made less than the number of initial changes. Factor analysis is used to determine the dominant factors in explaining a problem. Multivariate satura method is widely used. One multivariate is used in the field of sports to measure the anthropometric and physical dominant variables in karate where the variables (twelve independent variables and one dependent variable) that have been collected will be processed and analyzed using the Computerized Statistics Program with SPSS (Statistical Product and Service Solutions) Version 20.0 and using the Kaiser-Meyer-Olkin and Bartlett's Test.

## 3. Results & Discussion

Description of the data used to reveal the research variables studied. Data from test result and measurement are anthropometry and physical condition as independent variable which then processed and calculated using KMO and Bartlett's Test program.

Factor Analysis is a technique of calculation with multivariate system to compile factor from one set of variable which is considered feasible to be analyzed. The analysis to be used is R Factor to see the correlation between variables then performed Data Reduction to generate new variables that include several variable sets. The 12 variables that become the determinants of the futsal athlete will be tested whether they are all important variables or only some of them are feasible to be analyzed and grouped into the main factors. The steps to be taken are:

1. Selecting the appropriate variable to be incorporated into the factor analysis.
2. Extraction of variables on selected variables to be one or more factors by using the Principal Component method.
3. Conducting the rotation process to clarify the significant difference between one factor and the other.
4. Give a representative name of the factors that are formed.

The magnitude of the correlation between independent variables measured has a value between 0 to 1, to express a strong relationship KMO-MSA numbers should be above 0.5. This shows that the collection of variables in this study is significant and can be further processed. Further data is processed by looking at the magnitude of partial correlation between two variables by assuming fixed other variables

should be small. This detection is done by looking at Anti Image Correlation resulting in Measure of Sampling Adequacy (MSA) between 0 and 1. If  $MSA = 1$  variable can be predicted without error by other variable, if  $MSA > 0.5$  variable can still be predicted and can be analyzed further and when the  $MSA < 0.5$  variable is unpredictable and can not be further analyzed or excluded from other variables.

The results of this study are as follows from the results of factor analysis through SPSS media and supported by the theoretical foundation that has been put forward in Chapter II then obtained 2 factors which is a summary of the 12 factors analyzed are:

1. Factor 1: Height, weight, foot length, thigh muscle strength. There is a group of samples that the capabilities of the futsal athlete lie in height (0.853), weight (0.646), foot length (0.847), and thigh muscle strength (0.729). Because the four have a positive correlation value and are above 0.5 then the greater the value of these variables the higher the determinants of athlete achievement.

2. Factor 2: weight, leg length, and leg muscle power. There is a group of respondents that the futsal athlete achievement achievers are at body weight (0.525), velocity (0.762), and agility (0.746). Because the three have a positive correlation value and are above 0.5, the greater the value of these variables the higher the achievement of futsal athletes.

From the results of the discussion can be explained that the dominant anthropometry factors are height, weight, and foot length. And of the three have a positive correlation and are above 0.5. While for the dominant physical condition factor is thigh muscle strength, speed, and agility. All have positive correlation values that are above 0.5. And for the less dominant variable or whose value is below 0.5 is the length of the leg, the width of the sole of the foot, the elasticity of the togok, and the coordination of the ankle.

## 4. Conclusion

After analyzed by using confirmatory factor analysis with KMO and Bartlett's Test, the dominant anthropometric effect on futsal athlete is dominant anthropometry is height, weight, and foot length. While the dominant physical condition factors affect the athletes futsalyaitu thigh muscle strength, speed and agility. Whereas the physical condition factors included in the category of weak or less dominant is the length of the legs, the width of the sole of the foot, the formation of togok, and the coordination of the ankle.

### Implication

Taking into account the results of the research, the conclusions, and the discussion of the results of the research, the implications of the results of this study may contain the development of broader multivariate statistics when examined about the dominant implications in futon athletes with confirmatory factor analysis. From the variables that are analyzed using confirmatory factor analysis will produce the dominant factor in futsal athlete. On the basis of conclusions that have been taken, can be put forward implications in efforts to improve the performance of futsal athletes kususnya improve physical and anthropometripada atlet futsal. Based on the results of the analysis, the most dominant anthropometry effect on athletes athletes futsal height, weight, and the length of the foot. While the dominant physical condition factors affecting the futsal athlete are thigh muscle strength, speed, and agility. Based on the analysis result also get less dominant factor at futsal atlet in Surakarta City is leg length, width of foot, togok kelentuk, and eye coordination. With the maximum physical and anthropometry then the

dominant factor is very influential on futsal athletes. Physical and good anthropometry will produce the ability or movement of good futsal athletes, so futsal athletes can achieve maximum performance. Achievement of achievement can be improved through the dominant factors in the futsal athlete.

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