

ANTHROPOMETRICS AND PHYSICAL FITNESS FACTORS AS DETERMINANTS OF FUTSAL DRIBBLING AND PASSING SKILLS OF EXTRACURRICULAR STUDENTS AGED 12-15 YEARS

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Abstract

The objective of this study is to investigate anthropometric factors and physical fitness as determinants of futsal dribbling and passing skills of students aged 12-15 years. The population of this study was all extracurricular futsal players in Surakarta with a sample of 50 students obtained by simple random sampling technique. Data collection techniques used were tests and measurements. The data were analyzed with testing factor confirmatory analysis with the help of SPSS and Amos 21 program. The results of hypothesis testing proved that the overall anthropometric factors and physical fitness had a relationship to the skills of futsal dribbling and passing. The factors include: (1) Foot length with a regression coefficient value of 0.689, (2) Coordination with a regression coefficient value of 0.453, (3) Speed with a regression coefficient value of 0.237, (4) Endurance with a regression coefficient value of 0.229, (5) Flexibility with a regression coefficient value of 0.220, (6) Balance with a regression coefficient value of 0.237, and (7) Limb length with a regression coefficient value of -0.726. It can be concluded that the dominant factor to determine futsal dribbling and passing skills for 12-15 years old students is foot length.

Keywords: anthropometry; physical fitness; dribbling and passing; confirmatory analysis; futsal

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INTRODUCTION

Sport achievements in Indonesia according to the Law of National Sports System Number 3 of 2015 is a sport that fosters and develops sportsmen in a planned, tiered, and sustainable way through a competition to gain achievements with the support of sport knowledge and technology. More specifically, futsal sport entered Indonesia around the year 1998-1999. This sport started getting familiar in the community but has not progressed as rapidly as football.

The history of Indonesian futsal itself was officially recorded in 2002, when Indonesia was trusted by AFC (Asian Football Confederation) to organize the final round of Asian futsal championship in Jakarta. Seeing what Indonesia achieved within a period of less than 4 years, Indonesia was able to host the inter-state competition of futsal. It is a pride and achievement for Indonesia. In the Southeast Asian region alone, Indonesia ranks third, although still below Thailand and Vietnam. At the international level, Indonesia ranked 45 out of 114 in futsal achievements. It leaves homework for futsal sport in the country, a job that is certainly not easy. It needs long-term preparation of a team that can enter the world stage, an achievement that Indonesian society dreams of futsal sport.

The futsal game itself requires some dominant basic techniques. Some elements are more dominant than others. During the game, the percentage of which basic technique is more often done will be shown. The two most dominant basic techniques of futsal are dribble and passing. From the results of preliminary observations on futsal playing skills among students at the age range of 12-15, it is found that the skills of dribbling and passing is still low. In addition, it was found that out of the 30 students who attended futsal coaching, only 13 students mastered the techniques of dribbling and passing correctly, while 17 other students were still in the category of moderate and poor. This means for students aged 12-15 years, those who master dribbling and passing only accounted for 43.4%.

There are some anthropometric factors and other aspects that determine the skills of dribbling and passing, and hence the possibility of achieving in futsal. Sajoto (1995, p. 11) reported that "one aspect of achievement in sport is the biological aspect that includes structure and posture. Anthropometric characteristics can be determinative in enhancing or determining performance and skills level (Reilly & Thomas, 1979). Scholich (1986) stated that physical fitness as a whole is the basis of preparedness to compete.

History of science development shows a direct relationship between the increased status of a science with the level of development of measurements in the field of science (Abdullah & Muslim, 1978). With the advancement of science and technology, a measurement of humans and sport has become necessary. Abdullah and Muslim (1978) also argued that testing is important in sports. This is in accordance with research of the relationship of foot shape and leg length with explosive muscle limbs against athletics of girls aged 11-14 year by Hermawan & Tarsono (2017). They found that there was a correlation between foot shape and explosive power of leg muscle. The research investigating aerobic capacity's relationship to soccer skills at Getsempena FC club in 2016 (Irwandi & Aprizalmi, 2016) shows there was a significant relationship between aerobic capacity (vo2max) to soccer skills Getsempena FC 2016. Similarly, Wibowo (2014) studied the contribution of speed, elongation, and agility to the dribbling skills of students following the extracurricular soccer of Diponegoro Junior High School in Sleman.

For research on futsal, Aru (2016) conducted one on the relationship between speed and agility and dribbling skills on the futsal team of SMA YP UNILA Bandar Lampung. Suryanto (2011) conducted research on the relationship of eye-foot coordination, agility, and leg length to the skills of dribbling in students aged 14-15 years of Young Indonesian Education Institution at Sragen. Nazzala (2016) investigated the relationship between coordination, balance, and power of limb muscle and shooting skill in futsal using the back of the legs. Herein a question arises whether the anthropometric factors and physical fitness are also factors that determine futsal skills, not only dribbling but also passing. The findings will be beneficial for training programs provided to students, noting the anthropometric factors and physical fitness requirements of the extracurricular futsal students aged 12-15. Therefore, the authors conducted research on anthropometry and physical fitness as factors determining futsal dribbling and passing skills of extracurricular students aged 12-15 years.

METHOD

The approach taken in this research is quantitative, using the design of Factor Confirmation (Emzir, 2008). Factor analysis is one multivariate statistic method that tries 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.

One multivariate was also used in the study to measure the dominant variables of anthropometry and physical fitness in dribbling and passing abilities in futsal, where 9 variables were collected and processed and analyzed using computerized statistics program with SPSS (Statistical Product and Service Solution) versions 22 and AMOS 21. The use of the aid was because multivariate statistics requires many

mathematical calculations that are not possible to do manually.

RESULTS

The results of factor analysis of foot length, leg length, durability, speed, agility, balance, coordination to the skills of dribbling and passing in futsal can be seen from the calculation using the help of AMOS program version 21.

Table 4.6 Standardized regression weights

			Estimate
y1	<---	x1	.689
y1	<---	x2	-.726
y1	<---	x3	.229
y1	<---	x4	.237
y1	<---	x5	.324
y1	<---	x6	.193
y1	<---	x7	.453
y1	<---	x8	.220

Based on the results of the analysis of the above factors in table 1, the influence of variables X1 to X8 is obtained as follows:

- a. The regression coefficient of foot length (x1) on dribbling and passing skills is 0.689. This means that when foot length increases by 1 unit, dribbling skills and passing will increase by 0.689.
- b. The regression coefficient of limb length (x2) on dribbling and passing skills is -0.726. This means that if the length of the limb increases by 1 unit, the skills of dribbling and passing will fall down by 0.726.
- c. The regression coefficient of endurance (x3) on dribbling and passing skills is 0.229. This means that if agility increases by 1 unit, the skills of dribbling and passing will increase by 0.229.
- d. The regression coefficient of speed (x4) on dribbling and passing skills is 0.237. This means that if the speed of the foot increases by 1 unit, dribbling skills and passing will increase by 0.237.
- e. The regression coefficient of agility (x5) on dribbling and passing skills is 0.324. This means that if agility increases by 1 unit, the skills of dribbling and passing will increase by 0.324.
- f. The regression coefficient of balance (x6) on dribbling and passing skills is 0.193. This means that if the balance increases by 1 unit, dribbling skills and passing will increase by 0.193.
- g. The regression coefficient of coordination (x7) on dribbling and passing equals to 0.453. This means that if the reaction coordination increases by 1 unit, the skills of dribbling and passing will increase by 0.453.
- h. The regression coefficient of flexibility (x8) on dribbling and passing skills is 0.220. This means that if the increase in flexibility is 1 unit, the skills of dribbling and passing's increase will be 0.220.

DISCUSSION

From the results of the first hypothesis testing, it was found that the length of the foot on dribbling and passing skills in futsal obtained a significant result at 5% significance level.

Then, from the result of data processing by standardized regression, positive regression coefficient value for body height on dribbling and passing skills was obtained, equal to 0.689. This result is in accordance with research of the relationship of foot shape and leg length with explosive muscle limbs on the athletics of girls aged 11-14 years old (Hermawan & Tarsono, 2017). There is a correlation between foot shape and explosive power of leg muscle. The research also found that the foot shape variables contributed 40% to leg muscle explosive power. It turns out that the relationship is in accordance with this study that the results of positive regression coefficient for body height on the skills of dribbling and passing is 0.689 or 68.9%.

The second hypothesis for limb length on dribbling and passing skills in futsal obtained a significant result at 5% significance level. Then, from the results of data processing, negative regressive coefficient for the limb length on the skills of dribbling and passing futsal of -0.726 was obtained. The result is in accordance with the research by (Suryanto, 2011) which revealed that there was a significant relationship between limb length and height of futsal dribbling skills of -0.577 or limb length had a negative effect on the skills of futsal dribbling for 57.7%. This result is in accordance with the present study which explains that the ratio of limb length had a negative effect on the skills of dribbling and passing in futsal, equal to -0.726 or negative effect of 72.6%.

The third hypothesis of endurance factor on dribbling and passing skills in futsal obtained a significant result at 5% significance level. Based on standardized regression weight, the positive regression value for skills of dribbling and passing futsal is 0.229. The research titled by Irwandi & Aprizalmi (2016) shows there was a significant relationship between aerobic capacity (vo2max) to soccer skills of Getsempena FC 2016. Similar result was also demonstrated by Handoyo's research (2012), where there was a significant correlation between the endurance level of cardio respiration and the achievement of junior high school students following soccer extracurricular activity (Handoyo, 2012). This is in accordance with the present research which shows a positive regression for endurance to dribbling and passing skills in futsal.

The fourth hypothesis of speed on dribbling and passing skills in futsal obtained a significant result at 5% significance level. Based on the standardized regression weights, the value of positive regression coefficient for speed of dribbling and passing futsal is 0.237. Aru's research (2016) on the relationship between speed and agility with dribbling skills on the futsal team of senior high school students shows there was a significant relationship between speed and dribbling skills. Similarly, the present research shows a positive relationship between speed and dribbling and passing skills in futsal of 0.237.

The fifth hypothesis testing of agility on dribbling and passing skills in futsal obtained a significant result at 5% significance level. Based on standardized regression weights, the value of positive regression coefficient for agility of dribbling and passing futsal is 0.324. The result of this study corresponds to that of Qorby (2013) which explains that agility generates a positive regression coefficient value on dribbling and passing skills in futsal.

The sixth hypothesis regarding the balance on the skills of dribbling and passing in futsal obtained a significant result at 5% significance level. Based on the standardized regression weights, the value of positive regression coefficient of balance on the skills of dribbling and passing in futsal was obtained. This result is supported by that of research of Kustiawan (2015) that there was a significant influence of balance on soccer playing skills obtained a significant result at the level of 5% significance. The present study also explains the positive regression coefficient for balance on the skills of dribbling and passing in futsal equal to 0.193 or 19.3%.

The seventh hypothesis on the coordination factor on the skills of dribbling and passing in futsal obtained a significant result at 5% significance level. Based on the standardized regression weights, positive regression coefficient value for the coordination of dribbling and passing futsal capskills of 0.453 was obtained. The research on the relationship of eye-foot coordination, agility, and leg length to the skills of dribbling in students aged 14-15 years of Young Indonesian Education Institution at Sragen in (Suryanto, 2011) obtained similar result that there was a significant relationship between the coordination of the ankle on dribbling and a contribution of 36.764%. In the present study, positive regression coefficient for the coordination of the skills of dribbling and passing futsal of 0.453 or 45.3% was gained.

The eighth hypothesis on dribbling and passing skills in futsal obtained a significant result at 5% significance level. Based on the standardized regression weights, a positive regression coefficient value equal to 0.220 was obtained. The result corresponds to that of (Wibowo, 2014), although the latter was in the field of soccer.

CONCLUSION

The confirmatory factor analysis by using AMOS version 21 shows the results for the overall anthropometric factors, namely: foot length with a regression coefficient value of 0.689; limb length with a regression coefficient value of -0.726 and physical fitness on endurance with a regression coefficient value 0.229, speed with a regression coefficient value of 0.237, agility with a regression coefficient value 0.324, balance with a regression coefficient of 0.193, coordination with regression coefficient value of 0.453, and agility with a regression coefficient value of 0.220. These anthropometric factors have a relationship to the skills of dribbling and passing in futsal.

Based on the results of research on the analysis of factors, the following suggestions are made: Coaches

should understand the various factors that influence and support futsal playing skills, especially dribbling and passing. In addition, trainers should understand the variables other than anthropometric factors and physical fitness to make it easier to train and improve dribbling and passing skills. The trainer needs to develop a careful plan of practice with a sequence of logical exercises before the techniques of dribbling and passing skills are actually taught to futsal athletes. Finally, future researchers are encouraged to conduct research instruments in futsal game.

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