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Comparison of Performance Related Fitness of Ethiopian Youth Sports Academy U 15, U 17 and U 20 Male Football Players

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Abstract: ***The purpose of this study was to compare the performance-related fitness of Ethiopian Youth Sports Academy U15, U17, and U20 male football players. The entire population was taken for participation in this study rather than a sample due to the relatively small population size (all N = 80) and ease of accessibility. The study was used agility (Illinois Agility Test), 1.5-mile run and speed (10, 20 and 40 meters sprint) to evaluate the performance related physical fitness of football players. One way ANOVA was used as a part of inferential statistics using Statistical Package for Social Science (SPSS) version 20. From the result, a significant difference has occurred at the p < .05 level in their agility, a 1.5-mile run, 10m, and 20m and 40m sprints. Therefore, it is possible to conclude that age groups are major factors for agility, a 1.5-mile run, and 10m, 20m and 40m sprint in Ethiopian youth sports academy football player.***

Keywords: Performance, Fitness, Football

1. Introduction

Football is an endurance sport which includes numerous and constant changes of direction running intensity, types of movements such as running backward, forward, lateral and jump as well as accelerations, etc. (Martinez L. et al., 2014.). Football is a multi-dimensional sport requiring players to jog, run, sprint, accelerate, decelerate, jump, change direction and get up from the ground after falls and knocks (Bangsbo and Michalsik, 2002).

According to FIFA rule of law, a football game lasts 90 min, comprising two periods of 45 min separated by a 15-min intermission. The ball is typically in play for 55-60 minutes (Wallace and Norton, 2013). The remaining time is made up of throw-ins, free kicks, penalty kicks, goal kicks, injury time and periods when the ball is out of play (Carling and Dupont, 2011). Football is an endurance sport, during a 90 min match as it is evidenced by the ability of players to cover 10–13 km (Mohr et al., 2003, Krustrup et al., 2005, Mohr M, et al., 2008 & Mascio & Bradley, 2013) scattered with short sprints (2–6 s) (Stolen T et al., 2005). Throughout a match, players performing 24% walking, 36% is jogging, 20% is coursing, 11% is sprinting, 7% moving backward and 2% moving in ownership of the ball.

The modern game of football seems to be all about speed and power (Kemal Goral, 2015). According to Milenkovic, D (2011) Speed is highly genetically inherent motor ability of as quickly as possible passing from one place to another.

A football player has to build adequate size, speed and power in every football matches when it is played at international levels (Gaiguiba Thangal and Vinay Pawar, 2015). World class players like Cristiano Ronaldo or Lionel Messi, are repeatedly considered as talent individuals due to their capacities of physical performance such as speed, strength, and agility (Jorge Aurelio et al., 2016.).

According to Kemal Goral (2015), agility is one of the main determinants of performance in football and it can be successfully developed if the training is based on the changes of direction, which are done quickly and easily. A football player changes direction every 2–4 seconds (Verheijen, R, 1997) and creates 1, 200–1, 400 changes (Bangsbo, J., 1992; Bangsbo, Norregand & Thorsoe, 1991) of direction during a game. More recent research reported an average of 1459 changes in activity during a game (Krustup et al., 2005), which equates to a change in activity every 4 seconds (Stolen et al. 2005). Agility constitutes around 11% of player movement (Mirkov, D. et al., 2008; Mohr M. et al., 2008; & Stolen, TK.2005) and on average, a player will make 50 turns during a single match (Wisloff, U. et al., 1998 & Withers et al., 1982).

Performance related physical finesses were essential for modern football. Due to these most researchers investigated a number of findings in this area in different countries. However, in Ethiopia, such kind of finding in football is very limited. Therefore, the purpose of this study was to compare the performance-related fitness of Ethiopian youth sports academy male football players.

2. Materials and Methods

2.1. Subjects

The study population included all the three age groups (U20, U17, and U15) male football players who were trained in Ethiopian youth sports academy. The entire population was taken for participation in this study rather than a sample due to the relatively small population size (all N = 80) and ease of accessibility.

2.2. Procedure of Data Collection

The study was used agility (Illinois Agility Test), 1.5-mile run and speed (10, 20 and 40 meters sprint) to evaluate the performance-related physical fitness of football players.

2.2.1. Illinois Agility

To measure agility of football players, 101 performance evaluation tests (Mackenzie B, 2005) have been used.

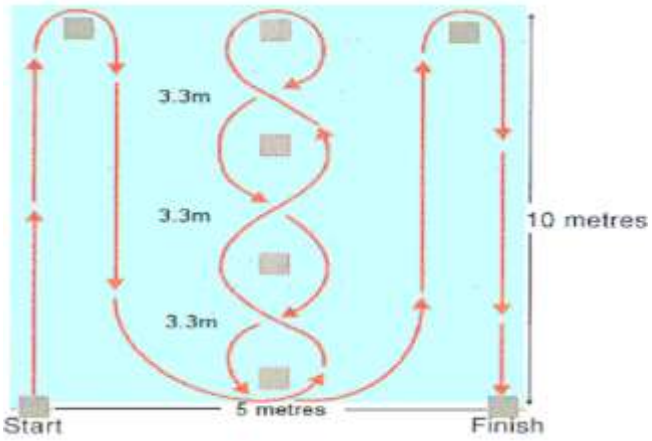

Figure 1: Illinois Agility Test

Source: 101Performance Evaluation Tests. London. Electric Word plc, Adapted from Mackenzie B, 2005

2.2.2. 1.5 mile run

To measure footballer's endurance, Cooper 1.5-mile (2.4-km) which is one of the most widely used running tests has been applied (Thompson, W.R., et al., 2009).

2.2.3. Speed (10m, 20m and 40m sprint)

The Purpose of these sprint tests was, to assess the speed abilities and acceleration of the players over distances of 10 meters, 20 meters and 40 meters (Chamari et al., 2004; Wisloff et al., 2004; Gabbett, 2004; Cometti et al, . 2001 and Kollath; Quade, 1993).

2.3. Statistical Analysis

One way ANOVA was used as a part of inferential statistics using Statistical Package for Social Science (SPSS) version 20.

3. Results and Discussions

3.1. Results

A one-way ANOVA between-groups analysis of variance was conducted to explore the impact of age on different performance-related fitness. Subjects were divided into three groups according to their age (Group 1: U 15; group 2: U 17; group 3: U 20).

Table 1: Analysis of Variance of performance-related fitness of Ethiopian youth sports academy male football player based on age group

	Age Group			
	U15 (X±SD)	U17 (X±SD)	U20 (X±SD)	ANOVA
	N=40	N=40	N=20	
Illinois Agility (sec)	18.75±1.19	18.29±.52	16.59±1.13	F(2, 97)=34.384, p=0.001
1.5-mile run (minute)	9.47±.697	9.58±.96	10.22±.79	F(2, 97)=5.825, p=0.004
10m Sprint (sec)	2.07±.209	2.49±.13	1.87±.08	F(2, 97)=121.745, p=0.001
20m Sprint (sec)	3.79±.344	3.43±.15	3.79±.14	F(2, 97)=25.327, p=0.001
40m Sprint (sec)	7.18±1.03	7.58±.27	7.49±.32	F(2, 97)=3.534, p=0.033

Source: compiled from SPSS and MS-Excel primary data, 2016

ANOVA revealed that football players of Ethiopian youth academy male football player based on three age groups (U15, U 17and U20) a significant difference at the $p < .05$ level in their agility ($F(2, 97)=34.384$, $p=0.001$) which is presented in table 1. As a there is a statistically significant difference across all age groups. The effect size, calculated using eta squared, was 0.41, which has a large effect. Furthermore, Post-hoc comparisons using the Scheffe test indicated that U 20 was significantly different with U 15 (mean difference =-2.1650, p=0.001.) and U 17 a significantly different with U 17 (mean difference =-1.6925, p=0.001.) age groups of male football players. U 15 and U 17 were not significantly different.

ANOVA revealed that male players of the academy based on three age groups (U15, U17, and U 20) a significant difference has occurred at the $p < .05$ level in their 1.5-mile run ($F(2, 97)=5.825$, $p=0.004$) which is presented in table 1. As a consequence, there is a statistically significant difference across all age groups. The effect size, calculated using eta squared, was 0.11, which has a large effect. Besides, post-hoc comparisons using the Scheffe test indicated that U 20 was significantly different with U15 (Mean difference =.75425, p=0.005) and U 17 a significantly different with U17 (Mean difference = .63925, p=0.022) age groups of male football players. Conversely, U15 and U 17 were not significantly different.

Similarly, ANOVA revealed that male football player based on three age groups (U 15, U17 and U 20) a significant difference has occurred at the $p < .05$ level in their 10-meter sprint ($F(2, 97)=121.745$, $p=0.001$) which is presented in table 1. As a consequence, there is a statistically significant difference across all age groups. As well the effect size, calculated using eta squared, was 0.72, which has a large effect. Additionally, comparisons using the scheffe test indicated that U15 was significantly different with U17 (Mean difference = -.4225, p=0.001) and U 20 (Mean difference = .200, p=0.001) age groups of male football players. On the other hand U 17 a significant difference with U20 (Mean difference =.6225, p=0.001).

Likewise, ANOVA revealed that players, based on three age groups (U15, U17, and U 20) a significant difference has occurred at the $p < .05$ level in their 20-meter sprint ($F(2, 97)=25.327$, $p=0.001$) which is presented in table 4.31. As a

consequence, there is a statistically significant difference across all age groups. The effect size, calculated using eta squared, was 0.34, which has a large effect. Moreover, Posthoc comparisons using the Scheffe test indicated that U 17 was significantly different with U15 (mean difference = -.36, p=0.001) and U20 (Mean difference = -.3575, p=0.001) age groups of male football players. On the other hand, U 15 and U 20 were not significantly different.

As well, ANOVA revealed that football players on an academy male football player based on three age groups (U15, U 17and U20) a significant difference at the $p < .05$ level in their sprint ($F(2, 97)=3.534$, $p=0.033$) which is presented in table 4.31. As a there is a statistically significant difference across all age groups. As well the effect size, calculated using eta squared, was 0.07, which has an effect. In addition, Posthoc comparisons using the Scheffetest indicated that only a significant difference between U15 and U17 (Mean difference = -.3975, p=0.039).

4. Discussion

ANOVA was made to analyze the mean difference of the three age groups of the male football players; a significant difference has occurred at the $p < .05$ level in their agility, a 1.5-mile run, 10m, and 20m and 40m sprints. As result age group is a major factor to convey differences in these listed and tested performance-related fitness for male age groups. Therefore, age groups are major factors for agility, 1.5 mile run, 10m, 20m and 40m sprint in Ethiopian youth sport academy football player.

5. Conclusion

1) With reference to Davis B. et al (2000) standard of Illinois Agility, few players have good and poor performance; however, the majority male players have below average. Therefore agility requires more training to have excellent performance in football.
2) In this research few male players have either superior or fair but the majority players have good performance in their cardio performance such as 1.5-mile run. Generally, it is clear that the academy players are in good position in cardiovascular fitness as well as aerobic capacity. Therefore Ethiopian youth sports academy football players more advantageous to stay on the field with endurance.
3) But it is different across male age groups in three sprints (10m, 20m, and 40m). Therefore, speed training has not been given large emphasis based on age category.
4) The results of the study produced there was a statistically significant difference across all male age groups at the $p < .05$ level in their physical performance. In this regard, male physical performance is highly dependent on age groups.

6. Recommendation

Some physical performances of Ethiopian youth sport academy football players such as speed, agility and endurance should give training based on player age.

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