The Effectiveness Of Speed And Agility Training On The Performance Of Arrowhead Agility And Creative Speed Test Among The Sultan Idris Education University (Upsi), League Football Players

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Abstract: This research is conducted to discover the effectiveness of speed training and agility on the performance of arrowhead agility and creative speed among IPT league footballs players of the Sultan Idris Education University (UPSI). The total of 18 respondents were selected from the university football league of University Pendidikan Sultan Idris (UPSI). The instruments that have been used in this research are Arrowhead Agility Test and Creative Speed Test by Jens Bangsbo & Magni Mohr (2012). The research design used is pre- test and post- test on the effect of before and after training intervention in a given period of time. Data were collected two times from the pre- test and post- test in term of the effectiveness of speed and agility training on the performance of arrowhead agility and creative speed test after 8 weeks of training intervention. Data obtained from respondents scores were analyzed using paired t-test from Statistical Package for Social Science software version 23.0. The findings of the research show that there was a significant difference (t=5.903, p<0.05) for the right leg and (t=7.771, p<0.05) for the left leg on performance of arrowhead agility test. Whereas for the creative speed test it shows significant difference of (t=4.888, p<0.05). Prior to this research it clearly indicate that the training programs conducted by the respondents in this research have positively impacted the performance of arrowhead agility and creative speed. As such, it is hoped that in the future the football coaches will emphasize the aspects of speed and agility in training to improve the performance of the players in the future.

Keywords: Agility, Speed, Performance, Football

1.   INTRODUCTION

Football is the most popular game in the world and interest to all ages as well as in Malaysia based on mass media statistic compared to other sporting events (Karim & Nadzalan, 2017). According to Silassie and Demena (2015), football is a flexible game that offers fun, even on small streets, playgrounds or school parks and for professionals competing at the top of world football. In football, players required to perform numerous actions that plays important role such as strength, speed, agility, power, balance, stability, flexibility and endurance (Bloomfield, 2007; Milanovic, 2013). Based on Stolen, Chamari, Castagna and Wisloff (2005) study and supported

by Florin (2018) research, during a football match, players cover approximately 10 km, which includes sprint every 90 seconds (11% of total activity) with each action lasting an average of two to four seconds and covering a distance of 15 m. Agility and speed is consider as fast action that involve rapid change of direction in response to a stimulus (Sheppard & Young, 2006). In addition, Falch (2019) state that agility is the beginning of body movement, change of pace and acceleration or decline, often in response to stimulation. The components of physical agility are the speed of change and factors such as techniques produced during change of direction, linear sprint techniques, the strength and power of the lower body muscle (Sheppard et al. 2006; Falch (2019). Agility is an important component of playing football and is defined by "the speed at which the body changes position or changes direction (Clarke, 1979; Falch, 2019). Speed can be define as the ability to run at certain distance at any given time and can accommodate as fast as possible as well as the maximum speed at which a movement or series of movements is perform (Jay R.Hoffman & John.F.Graham, 2012). The purpose of this present study therefore to discover effective training method which involve fitness component agility and speed that can enhance the coach's knowledge to prepare systematic coaching techniques in their coaching program. In fact, Karim (2016), do mentioned that sources of football training knowledge are most important characteristics that provide benefit to them as coaches in their coaching practice.

2.   METHODS

2.1   Study Area
The test was conducted at the Sultan Idris Education University Mini Stadium, Tanjong Malim, Perak. Depending on the suitability of the place and weather conditions of the day, the test is conducted and at the discretion of the researcher, guided by the suitability of the place and the form of the study.

2.2   Study Design
This design of research is quasi experimental study. The research design used is pre- test and post- test on the effect of before and after training intervention in a given period time. In such a way, data were collected 2 times pre- test and post- test from the IPT league footballs players of Sultan Idris Education University (UPSI) in terms of the effectiveness of speed and agility training on the performance of arrowhead agility and creative speed test after 8 weeks of training intervention. For the purpose of this research, 18 league footballs players of Sultan Idris Education University (UPSI) were selected as the subject.

2.3   Instrument
The research instrument used in this research is using an arrowhead agility test and creative speed test that have been used by Jens Bangsbo &Magni Mohr (2012) fitness testing in football as showed in figure 1.

Arrowhead Agility Test
 Objective: To evaluate the speed, explosion, body control; and the ability to change direction over a range of angels and direction.

Equipment: Stopwatch, measuring tape, 6 tape markers, whistle and sample information form for recording test results.

Procedure: i. The markers are placed with three sets in an arrowhead shape, and one set to indicate the start and finish line.

ii. The player stand with one foot on the starting line and the other foot behind the starting line in a sprint start position.

iii. In count of three, the layer runs as fast as possible from the starting line to the middle marker (A), move to the side marker (C) or (D) and through marker (B) and back through the start / finish line.

iv. Subjects complete two paths, one left and one right, separated by at least 5 minutes of rest.

v. If this cone is used, the test is invalid if the player steps on the cone instead of around it.
vi. The test result is the amount of time it takes to complete the test for the left and right

vii. Time is recorded in the second to the nearest of decimal places in each direction

Creative Speed Test
Objective: To evaluate the sprinting and coordination ability when dribbling with the ball.

Equipment: Stop watch, measuring tape, 12 cone, ball, whistle and sample form for recording test results.

Procedure: i. The player starts in the middle of starting zone *(penalty spot; point 1)* with the back to the test course.

ii. Ball is passed to the player from a distance of 2 meters when the player has returned the ball, the player turns around and sprint to the point 2.

iii. Alternatively, the test leader count down '3 2 1 then go' the player turns around and sprint to point 2.

iv. A the point 2, the player takes the ball and is dribbling as shown in *figure 1*.

v. When the player gets back to point 2, he kicks the ball forward and finish by shooting from the starting zone *(point 1)*.

vi. The ball has to go into one of the corners of the goal, otherwise the result   is not valid and the player has to repeat the test.

vii. If stopwatch is used, it is started when the players touched the ball passed to him or when the starters say 'go' and its stopped when ball passes the goal line.
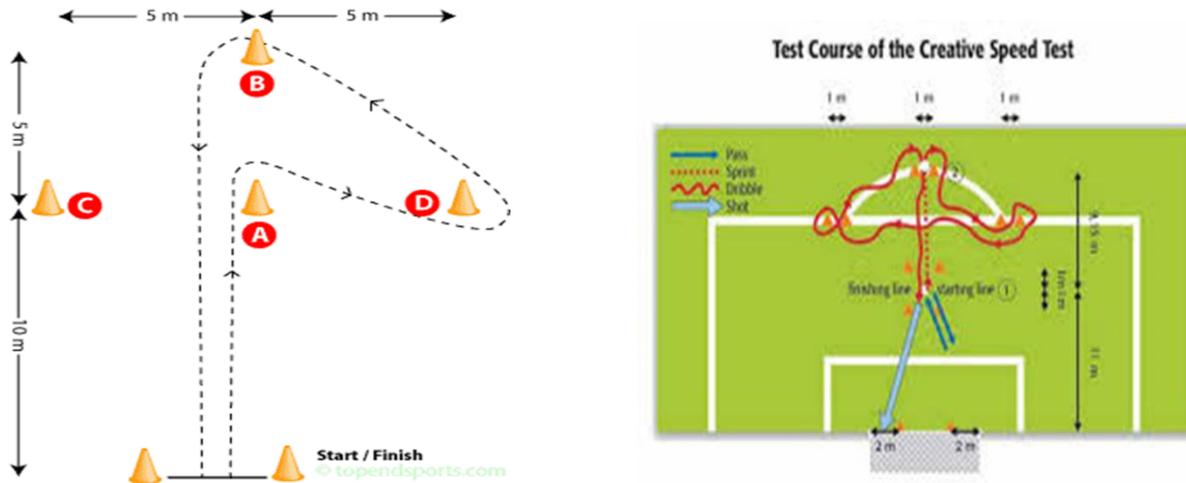
Figure 1: Arrowhead Agility and Creative Speed Test (Jens Bangsbo & Magni Mohr, 2012)

3.   RESULTS

Based on the research that has been conducted, data on the arrowhead agility and creative speed test was obtained. The data is presented as shown in the table below.

Table 1

Average Score, Standard deviation, t-value and Significant Value for the Arrowhead Agility Test Right Legs IPT League Footballs Players of Sultan Idris Education University (UPSI), on Pre and Post-Test.

	Mean	Mean Difference	Standard Deviation	T-Value	Significant
Pre-Test Right Legs	12.60		1.14		
		0.95		5.903	.000
Post Test Right Legs	11.65		1.17		

Significant Level = < 0.05

Table 1 shows the pre and post-test scores for the right leg arrowhead agility test. The mean score for the pre-test was 12.60 and the standard deviation was 1.14. The mean score for the post-test was 11.65 and the standard deviation was 1.17. The mean difference for both pre and post-test was 0.95. The t- value = 5.903 and significant value = p.000. These results indicate that there is a significant difference between pre and post-test for right leg arrowhead performance after 8 weeks of training intervention.

Table 2
Average Score, Standard deviation, t-value and Significant Value for the Arrowhead Agility Test Left Legs IPT League Footballs Players of Sultan Idris Education University (UPSI) on Pre and Post-Test.

	Mean	Mean Difference	Standard Deviation	T-Value	Significant
Pre-Test Left Legs	12.64		0.94		
		1.22		7.771	.000
Post Test Left Legs	11.42		0.85		
Significant Level =< 0.05					

Table 2 shows the pre and post-test scores for the left leg's arrowhead agility test. The mean score for the pre-test was 12.64 and the standard deviation was 0.94. The mean score for the post-test was 11.42 and the standard deviation was 0.85. The mean difference for both pre and post-test was 1.22. The t- value = 7.771 and the significant value = p.000. These results indicate that there is a significant difference between pre- and post-test for left legs arrowhead performance after 8 weeks of training intervention.

Table 3

Average Score, Standard deviation, t-value and Significant Value for the Creative Speed IPT League Footballs Players of Sultan Idris Education University (UPSI) on Pre and Post-Test.

	Mean	Mean Difference	Standard Deviation	T- Value	Significant
Pre-Test	17.29		1.00	4.888	.000
		0.85			
Post Test	16.44		0.76		
Significant Level = <0.05					

Table 3 shows the pre and post-test scores for the creative speed test. The mean score for the pre-test was 17.29 and the standard deviation was 1.00. The mean score for the post-test was 16.44 and the standard deviation was 0.76. The mean difference for both pre- and post-test was 0.85. The t- value = 4.888 and the significant value = p.000. This result shows that there is a significant difference between pre and post-test for creative speed performance after 8 weeks of training intervention.

4.   DISCUSSION

Based on the results obtained for all speed and agility tests conducted using paired t-tests, it is clear that there are significant differences in the test results in pre-test and post-test. The result of the arrowhead agility of the right legs shows ($t=5.903$, $p<0.05$). Whereas the results for the left legs arrow agility are ($t=7.771$, $p<0.05$) and finally the resulting value of creative speed shows the significant difference of ($t=4.888$, $p<0.05$). Referring to this result, as a coach digesting the knowledge of multiple factors influence from different branches of the sports science. As mentioned by Ramalu (2007) and Karim (2017) biomechanics always view agility in terms of mechanical changes such as body position altering. Sports psychologist will observe the effect of agility by coordination of motor learning that occurs during learning and retaining specific motor skills. Where else strength and conditioning trainer observe agility from the aspect of motor skills required for a quick movement direction change. According to Johnson and Nelson (1986), this states that components of agility can be gained through proper practice, training and teaching. This result shows that there is an impact on the performance of Arrowhead Agility and Creative Speed test by Jens Bangsbo & Magni Mohr, (2012) after undergoing 8 weeks of intervention.

Previous researchers have shown that speed, agility and quickness are the training methods that should be used on fitness components in footballs (Pearson, 2001). While Jullien et al., (2008) short-term training programs *(3 weeks)* increase the level of agility among professional footballers at a young age. However according to Barrow (2013), there is no "gold standard" to refer agility testing in football players is established. Hence it is limited as different test may examine different factors associated performance. The Arrowhead Agility and Creative Speed test by Jens Bangsbo & Magni Mohr, (2012) was a long time proposed nevertheless it is least used in Malaysian training program (Ramalu, 2007; Karim 2017). Indirectly, the results of this study have shown that the results of the 8-week training intervention provided a significant p = .000 on the performance of Arrowhead Agility and Creative Speed test of IPT League footballs players of Sultan Idris Education University (UPSI) on pre-test and post-test significantly have an impact on performance. Systematic and more detailed testing in the future will be able to produce more detailed test results and benefit the footballs coach to make improvements in existing training programs.

Comparison of average scores showed that there were significant differences between pre-test and post-test. The arrowhead agility test data for the right leg at pre-test and post-test were analyzed using paired t-test analysis. The results showed that there was a significant difference between pre-test and post-test with values (average ± standard deviation = 12.60 ± 1.14) before receiving 8-week training interventions and values (average ± standard deviation = 11.65 ± 1.17) after receiving training interventions. The significant value obtained from paired sample tests was p = .000 and this indicates that there is a significant difference in the impact of training on the performance of arrowhead agility of the IPT League footballs players of Sultan Idris Education University (UPSI).

The results of the left leg arrowhead agility test were also obtained in the results of this study. The results show that there are significant differences between pre-test and post-test. For pre-test the values showed (mean ± standard deviation = 12.64 ± 0.94) and for post-test after subjects underwent 8 weeks of training intervention showed value (average ± standard deviation = 11.42 ± 0.85). The significant value obtained from paired sample tests was p = .000 and did not exceed the required significance value of p = 0.05. It is clear that there has been a significant difference in the left leg arrowhead agility test.

In addition, for the creative speed test after 8 weeks intervention, results from paired sample tests showed a significant p = .000 value. At the pre-test, the value (average ± standard deviation = 17.29 ± 1.00). However, after the training intervention, scores on post-test showed (average ± standard deviation = 16.44 ± 0.76) for the creative speed test of the IPT League footballs players of Sultan Idris Education University (UPSI).

The results of this study are further reinforced when Pojskic, Aslin, Krolo, Jukic, Uljevic, Spasic and Sekulic (2018) states that specific agility training has a significant effect on increasing the level of agility for footballs players. It is clearly showing in their recent study that development of specific football test on agility enhance the specific motor proficiency. In the Jonavic (2013) study where speed, agility and quickness (SAQ) training were given to the player for 8 weeks during the tournament season and the result that the tested players had an increase in power performance and helped reduce the amount of training during the competition. In line with Ramalu (2007) and Karim (2017) that agility is one of the most important components of modern footballs which requires high endurance, power and agility. As such, the specific training programs in this study can provide a great benefit to the player especially in terms of speed and agility and also enhance the performance of arrowhead agility and creative speed. Specific training programs need to emphasize the frequency, intensity, duration and timing of the training is an important feature of the player's adaptation.

Overall, based on the research conducted and the specific limitations of the researcher, it can be concluded that the study of the effectiveness of speed training and agility on the performance of arrowhead agility and creative speed of the IPT League footballs players of Sultan Idris Education University (UPSI) proved to be effective and improve after 8 weeks of intervention. The results of the study showed that there were significant differences in the performance of arrowhead agility and their creative speed. Although this training program is impactful, researchers believe that this training program needs future review. This training program needs improvement in terms of modifications to the training program that emphasize appropriate training principles, systematic periodization planning, psychological skills and periodic assessment of mental and physical aspects. A variety of training methods from the physical and sporting aspects of footballs as well as psychological skills can boost player's performance to the next level.

5.   ACKNOWLEDGEMENT

6.   References

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