Selected Physical Fitness Profile of Football Referees in Cross River and Akwa Ibom States, Nigeria

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Abstract: *The purpose of this study was to compare physical fitness profile of football referees in Cross River and Akwa Ibom States. Physical fitness profiles compared were muscular endurance and muscular strength of the referees. Standardized equipment and procedures were employed in the tests. To achieve the objectives of the study, two research hypotheses were raised to serve as a guide to the study. The quasi-experimental research design was adopted for the study. A total of twenty (20) subject were selected using stratify random sampling technique. Data collected were analysized using descriptive and inferential statistics. The descriptive statistics were the mean, range and standard deviation while the inferential statistic was the independent "t" test employed to test for significant difference between the mean scores of subjects from the two states. The level of significance was set at .05 with 18 degree of freedom. Findings of the study revealed that referees from Cross River and Akwa Ibom States were similar in muscular endurance and muscular strength when compared. Based on these findings of the study, appropriate conclusions and recommendations were made.*

Keywords: *Physical Fitness Profile and Football Referees.*

1. INTRODUCTION

Physiological and motor performance skills such as cardiovascular endurance, muscular endurance, and muscular strength, resting heart rate, blood pressure, speed, agility and mental skills such as visual perception, attention, concentration, composure and decision-making are all required by referees at any level of the game. The ability to cope with the pressures of refereeing had increased. As referees are required to keep up with the game, they are likely to suffer from physical fatigue and this will no doubt affect their physiological, motor and mental performance and hence decision making. (http:/www.soccer performance.org/html/home.htm, 2011).

The responsibilities of soccer referees are to control players' behaviour and implement the rules of the game during competitive football. These place strenuous task on the referee's speed performances as well as bio-physiological functioning. The Nigerian Soccer Referees are always seen to have good speed performance when officiating in the National premier and Professional League competitions but were not seen at International levels, (Abass, Moses, Alabi, Adedugbe, Falolas & Abayomi, 2011). Asagba (2004) established that officiating officials in soccer have some moments of robust runs and sudden stoppages, intermingled with uneven walks and shuttles in different directions. Abass (2005) supported that; aerobic ability cannot see a soccer referee through successfully in ball games because of these frequent changes of space and need for sudden sprints. Sumiya, Tashima, Nakahara, and Shohoji (2001) submitted that attempt for referees to carry out their functions demands for maturity in terms of age, a biological parameter. They added that age poses strenuous task on the cardiorespiratory functioning of any individual and mostly referees and that soccer referees must be

reaching and maintaining a high level of fitness. In this direction, therefore, referees must maintain a constant training programmed from time to time as they mature with officiating age. Asagba (2004) contributed by saying that, a soccer referee is supposed to be within 10 to 15m range from the ball at any time during play. Baumhakel, Kindermann, Kindermann and Bohn (2007) submitted that referees should have good physical condition as requirements during a match.

2. LITERATURE REVIEW

Muscular endurance is one of the specific requirements which has been defined and described in various ways by different authors. Hickson (1980) defined endurance (also called sufferance, stamina, Resilience) as the ability of an organism to exert itself and remain active for a long period of time, as well as its ability to resist, withstand, recover from, and have immunity to trauma, wounds, or fatigue. In humans, it is usually used in aerobic or anaerobic exercise. He went further and stated that, the definition or 'long' varies according to the type of exertion- minutes for high intensity anaerobic exercises, hours or days for low intensity aerobic exercise. He concluded that, training for endurance can have a negative impact on the ability to exert strength unless an individual also undertakes resistance training to counteract this effect. For Quinn (2012) muscular endurance is the ability of a muscle or group of muscles to sustain repeated contractions against a resistance for an extended period of time.

According to Canadian Fitness and Lifestyle Research Institute (2002) muscular endurance is very important. For people playing sports and who have to sustain an activity for long periods of time, muscular endurance they said is determined by how well your slow twitch muscle fibres are developed. They further stated that, there are generally two types of muscle fibres in the body, slow twitch and fast twitch. Slow twitch muscle fibres they said cannot exert muscle force as fast twitch, but can sustain and effort over a much greater period of time, while fast twitch muscle fibres can exert a great amount of force but for a very limited amount of time. Thus, they said slow twitch equals endurance, while fast twitch equals strength. They also suggested that it is important to pay attention to muscular endurance if you play any sort of sports, or are involved in any sort of physical activity that's lasts for quite a while, examples, hockey, football, tennis, etc. Another activity they said that is very dependent on muscular endurance is cross country running, and concluded that it is probably the best example of muscular endurance, as it involves very little muscular strength or flexibility.

According to Takanami, Iwane, Kawai and Shiemonitsu (2000) endurance is one of the basic components of physical fitness. As a result, most athletes or referees have to posses some degree of muscular and cardiorespiratory endurance to perform in their respective sports. They stated that, muscular endurance is the ability of a muscle or group of muscles to repeatedly develop or maintain force without fatiguing.

Though a high relationship has been established between muscular strength and absolute endurance, Quinn (2012) still believes that muscular endurance is best increased through muscle training that emphasizes high repetitions and relatively low resistance. American College of Sports Medicine (2000) concluded that, high resistance with low repetition exercise will build powerful muscles while low resistance with high repetition exercise will build the endurance qualities of muscles.

For soccer with duration of play of ninety (90) minutes, an adequate level of both muscular and cardiovascular endurance is necessary for effective performance, thus should form an integral part of referees training.

Muscular strength, for some time now, has been considered as basic in most of human performance as other qualities such as endurance, speed, power, agility etc depend on it. According to Canadian Fitness and Lifestyle Research Institute (2002) muscular strength is much different from muscular endurance. Strength is a measure of how much force your muscles can exert, while endurance is the measure of how many times your muscles can repeat a specific exertion of force. Unlike muscular endurance which is controlled by slow twitch fibres, strength is determined by fast twitch fibres which focus more on quick bursts of energy rather than long, drawn out ones. They also stated that, it is a much different procedure when it comes to improving strength. The most widely used method they said is lifting a weight that is 70% of your maximum 10-12 times.

Quinn (2012) defines strength as the ability of the body or its segments to apply force thus making it a specific quality of muscles. He is of the opinion that there are two types of muscular strength static

and dynamic with the dynamic type being more regularly utilized in physical performance. He opined that strength involves a combination of three factors namely the combined contractile forces of the muscles causing the movement (agonists) the ability to co-ordinate the agonistic muscles, with the antagonistic muscles, the neutralizers and the stabilizers and finally the mechanical ratios of the lever (bone) arrangements involved. He then stressed the importance of strength in performance by saying that though nearly all movements are performed against some resistance, athletes perform against much greater resistance than usual. Examples which could be cited to buttress this point are events like shot put, discus throw, pole vault, jumping, running, striking and kicking to mention a few.

According to Bryan (2013) muscular strength is important in soccer and other sports for several reasons. Primarily, muscular strength is a major component of overall fitness and athleticism, which are necessary in order to excel in sports. Secondly, stronger muscles are often equated to larger, heavier frames that help prevent getting pushed around on the field. More generally muscular players (and non-players) are healthier, which he said is beneficial as sportsmen. Bryan (2013) further stated that, soccer players or referees used their muscles in a variety of ways during play/match. Strong legs he said are often considered the most important, because most players and referees will run several miles during a match. The legs he said are used not only for running, but for maintaining balance, stopping and changing direction, and of course kicking the ball. A player and referee with weak muscles are not able to do any of these things very well and may get tired easily.

Apart from the performance based contribution of strength, muscular strength plays an important role in protecting athletes from injury. Strong muscles enable an athlete to move quickly and avoid accidents especially to the joint stability. Since muscular strength is so important to performance and for injury protection, it is necessary that it is adequately developed in athletes and referees.

3. METHODOLOGY

The study was a quasi-experimental research design in which status of football referees in both Cross River and Akwa Ibom States were compared. Their means values in selected physical fitness profiles were compared to determine whether or not, there was any significant difference between the two groups. The population of the study consisted of 54 Grade one (1) referees in the two states comprising twenty eight (28) referees from Cross River and twenty six (26) referees from Akwa Ibom States. These subjects (referees) were certified by their States Training Officer (STO) as having been travelling out for league matches or other competitions of similar importance. Stratified random sampling technique was employed in this study. The stratified sampling was employed considering the heterogeneous nature of the referees in terms of their categories such as Nation Wide League Referees, National League Referees and Premier League Referees. This sampling technique reduces sampling error as it enables the researchers to identify and consider the heterogeneous characteristics of the population while drawing the sample.

In selecting referees from the categories, each category was considered a stratum. Thus, from each stratum, the number of referees was proportionally selected using the simple random sampling technique. The selection criterion was based on the numbers of referees in each category. The aim was to have 4 referees from the premier league, 8 each from the national and nation-wide leagues totaling twenty (20) referees from the two states i.e. ten (10) referees from each state. From the population of 54 football referees in the two states, a total sample size of 20 subjects (referees) was obtained. This results to 4 premier league referees, 8 each from national and nation-wide leagues referees from the two states. The research instruments used in this study was a standardized instrument (Test Batteries). The University of Calabar exercise physiology laboratory was used as testing venue. The University of Calabar exercise physiology laboratory served as venue for the determination/estimation of the following variables; muscular endurance of the arms, abdomen, legs and muscular strength of the arms, back and legs.

4. HYPOTHESIS 1

The hypothesis states that, there is no significant difference in the muscular endurance profile of football referees in Cross River and Akwa Ibom States. The null hypothesis was analyzed using the descriptive and inferential statistics. The result of the analysis is presented in table 1.

Table1. *Means, standard deviations, ranges and independent t- values of the muscular endurance fitness profile of football referees in Cross River and Akwa Ibom States*

Variables	Groups	No	Means	Standard Deviations	Ranges	t- Values
Push-ups	CRS	10	28.50	6.852	22-41	.034
	AKS	10	28.40	6.275	19-37	
Sit-ups	CRS	10	25.70	4.029	20-32	-.293
	AKS	10	26.30	5.056	21-30	
Step-ups	CRS	10	39.40	2.716	36-43	.719
	AKS	10	38.50	2.877	34-43	
Endurance	CRS	10	31.20	3.259	28-37	.371
	AKS	10	30.70	2.751	27-35	

Not Significant at .05 level, critical t=2.101: df= 18.

Table 1 is a tabular presentation of results for muscular endurance fitness profile which were tested. Cross River referees were observed to have a mean of 28.50 in push-ups, a standard deviation of 6.852 and a range of 22-41 repetition per minute. Akwa Ibom referees had 28.40 repetitions per minute, 6.275 for standard deviation and a range of 19-37 repetitions per minute. For significance, a t-value of .034 was calculated. For sit-ups, means of 25.70 and 26.30 repetitions per minute were recorded for Cross River and Akwa Ibom State respectively. Their standard deviations were 4.029 and 5.056 with ranges of 20-32 and 21-30 repetitions per minute respectively. A t-value of -.293 was calculated. The mean scores for Cross River referees and Akwa Ibom referees in step-ups were 39.40 and 38.50 repetitions per minute respectively. While their standard deviations were 2.716 and 2.877 with ranges of 36-43 and 34-43 repetitions per minute respectively. The t-value was .719. Finally, on the average for muscular endurance profile, Cross River referees recorded a mean of 31.20, 3.259 for standard deviation and a range of 28-37 repetitions per minute. While Akwa Ibom referees also recorded a means of 30.70 repetitions per minute with a standard deviation of 2.751 and a range of 27-35 repetitions per minute. The t-value was .371. The result of the analysis showed that all the calculated t-values were all less than the critical t-value of 2.101 when tested at .05 level of significant with 18 degree of freedom. This result was not significant indicating that there was no difference between the two groups in muscular endurance status. Therefore the null hypothesis was upheld. This finding has answered the research hypothesis one which seeks to know how referees in Cross River and Akwa Ibom States differ in their muscular endurance status.

5. HYPOTHESIS 2

Hypothesis two states that, there is no significant difference in muscular strength of referees in Cross River and Akwa Ibom states. This null hypothesis was analyzed using descriptive and inferential statistics. The result of the analysis is presented in table 2 below.

Table2. *Means, standard deviations, ranges and t-values of the muscular strength fitness profile of Cross River and Akwa Ibom States football referees*

Variables	Groups	No	Means	Standard Deviations	Ranges	t- Values
Legstrength	CRS	10	60.10	4.202	50-65	.132
	AKS	10	59.60	11.197	49-90	
Backstrength	CRS	10	61.30	4.398	51.66	-.815
	AKS	10	64.80	12.856	51.98	
Rightarm	CRS	10	46.20	5.750	37-54	1.156
	AKS	10	43.40	5.060	35-52	
Leftarm	CRS	10	43.40	5.719	35-52	.441
	AKS	10	42.40	4.326	35-51	
Strength	CRS	10	52.60	4.402	43-57	.082
	AKS	10	52.40	6.381	45-69	

Not Significant at .05 level, critical t=2.101: df= 18

Table 2 above is the tabulation showing the means, standard deviations, ranges and t-values for the muscular strength fitness profile. A means of 60.10kg was observed for the leg muscle strength fitness characteristics. A means of 60.10kg was observed for the leg muscle strength of Cross River referees. Their standard deviation was 4.202kg with a range of 50-65kg. Akwa Ibom referees on the other hand had mean leg muscle strength of 59.60kg; 11.197kg was the standard deviation with range of 49-

90kg. For t-values, .132 was obtained. Cross River referees recorded a back muscle mean strength of 61.30kg, a standard deviation of 4.398kg and a range of 51-66kg. Akwa Ibom referees registered a means of 64.80kg with a standard deviation of 12.856kg. The range was 51-98kg and the test for significance gave a t-value of -.815. Cross River referees were observed to have meant right arm muscle strength of 46.20kg, a standard deviation 5.750kg with a range of 37-54kg. While Akwa Ibom referees had, for their right arm muscle strength a mean of 43.40kg, a standard deviation of 5.060kg, and a range of 35-52kg. At t-value of 1.156 was obtained. For the left arm muscle strength, Cross River referees had a mean of 43.40kg, a standard deviation of 5.719kg and a range of 35-52kg. Akwa Ibom referees recorded a mean of 42.40kg, with a standard deviation of 4.326kg and a range of 35-51kg. The calculated t-value was .441. Finally, in finding the average, Cross River referees had a mean of 52.60kg, a standard deviation of 4.402kg and a range of 43-57kg. Akwa Ibom referees were also observed with a mean of 52.40kg and a range of 43-57kg. Akwa Ibom referees were also observed with a mean of 52.40kg with 6.381kg for standard deviation and a range of 45-69kg. The t-value was .082. The result of the analysis showed that all the calculated t-values were all less than the critical t-value of 2.101 when tested at .05 level of significant with 18 degree of freedom. This result was not significant indicating that there was no difference between the two groups in muscular strength status. Therefore the null hypothesis was upheld. This finding has answered the research hypothesis two which seeks to know how referees in Cross River and Akwa Ibom States differ in their muscular strength status.

6. DISCUSSIONS OF FINDINGS

Push-ups counts in a minute were used to determine the arm muscle endurance. A mean of 28.50 repetitions per minute and 28.40 repetitions per minute were observed for Cross River and Akwa Ibom referees respectively. When compared, there was no significant difference between the two groups. Cross River referees had a range of 22-41rpm with a standard deviation of 6.852rpm while Akwa Ibom referees had a range of 19-37rpm with a standard deviation of 6.275rpm. Football referees do not utilize their hands much, during the game, to warrant arm endurance, therefore it may not be a factor for successful performance in officiating a game of soccer. However, a referee requires more than what is accepted as normal for the purpose of physical fitness.

Sit-ups counts per minute tested the abdominal muscle endurance and the following means were recorded; 25.70 rpm and 26.30rpm for Cross River and Akwa Ibom referees respectively. Previous studies with football referees consulted, did not consider this profile and did not suggest any physical fitness norm against which a comparison could have been made. However, an average abdominal endurance should be expected for referees of this status.

Step-ups counts in a minute were used to determine the leg muscle endurance. In this test, Cross River referees recorded a mean of 39.40rpm while Akwa Ibom referees were observed to have a mean of 38.50rpm. Both values had no significant difference when compared. Cross River referees also had a range of 36-43 rpm and a standard deviation of 2.716 rpm while Akwa Ibom referees recorded a range of 34-43 rpm and a standard deviation of 2.877rpm. Previous studies consulted; did not suggest any physical fitness norm against which a comparison could have been made. However, average leg muscle endurance is required by a referee for effective performance. This is in line with Takanami, Iwane, Kawai and Shiemonitsu (2000) who states that endurance is one of the basic components of physical fitness. As a result, most athletes or referees have to posses some degree of muscular and cardiorespiratory endurance to perform in their respective sports. They stated that, muscular endurance is the ability of a muscle or group of muscles to repeatedly develop or maintain force without fatiguing.

From the leg muscle strength, a mean of 60.10kg was observed for Cross River referees and 59.60kg for Akwa Ibom referees. When compared, there was no significant different between muscular strength of football referees in the two states. Cross River referees had a range of 50-60kg with a standard deviation of 4.202kg while Akwa Ibom referees had a range of 49-90kg with a standard deviation of 11.197kg. Both groups exhibited gross lack of homogeneity for this variable. Previous studies with referees consulted; do not suggest any physical fitness norm for referees which a comparison could have been made.

Similar observation was noticed when the back strength was tested, Cross River referees recorded a mean of 61.30kg with a range of 51-60kg and a standard deviation of 4.398kg while 64.80kg as mean

with a range of 51-98kg and a standard deviation of 12.856kg for AkwaIbom State referees. When compared, there was no significant difference between them.

The mean arm muscle strength for Cross River referees was 46.20kg for the right hand grip and 43.40kg for the left hand grip. Akwa Ibom referees in the other hand, had a mean of 43.40kg for the right hand grip and 42.40kg for the left hand grip. When compared, there was no significant difference for the two hands for the two groups. For the right hand, Cross River referees had a range of 37-54kg with a standard deviation of 5.750kg while Akwa Ibom referees had a range of 37-54kg with a standard deviation of 5.750kg while Akwa Ibom referees had a range of 35-52kg with a standard deviation of 5.060kg. For left hand, Cross River had a range of 35-52kg and a standard deviation of 5.719kg while Akwa Ibom referees had a range of 35-51kg with a standard deviation of 4.326kg.

It was worth noting that Cross River and Akwa Ibom referees had very close mean values for both right and left hand grips. The close values observed for referees from the two groups might come as a result of the fact that both hands are used in signaling, with almost equal amount of strength, while executing the various signals. This demand on the two hands brought about by the requirements of the game, therefore affected both hands equally. Bryan (2013) did establish that, soccer players or referees used their muscles in a variety of ways during play/match.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on the result of this comparative study on the physical fitness profile of football referees in Cross River and Akwa Ibom States, the following conclusions were made:

- There is no significant difference in muscular endurance profile of referees in Cross River and Akwa Ibom states.

- There is no significant difference in muscular strength profile of referees in Cross River and Akwa Ibom States.

- Based on the conclusions of the study, it was recommended that:

  ➢ Though no significant difference were observed in the variables tested between the two groups, however, strength training should be included in the referees' training programme to enable them gain strength and stamina to cope with the game.

  ➢ Nigeria (Football) Referees Association should encourage its members to continue training and maintain their physical fitness status during and after the Football Season.

- Nigeria Football Federation and Nigeria (Football) Referees Association should design training programmes that would detect, monitor and render an opportunity for referees to achieve their physical fitness status.

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