

Physical Characteristics and Fitness Level of Secondary School Students in Kwara State, Nigeria

Surajudeen Tosho Bakinde, Olukunmi 'Lanre Olaitan,
Olusesi Bennett Ajayi-Vincent, and Tajudeen Olarewaju Ibrahim

Department of Human Kinetics and Health Education,
University of Ilorin, Nigeria.

Corresponding Author: Olusesi Bennett Ajayi-Vincent

Abstract

This study investigated physical characteristics and fitness level of secondary school students in Kwara State, Nigeria. A purposive sampling technique was adopted to select 80 students from public and private secondary schools. An experimental research design was carried out, using standardized instruments to take measurements on physical characteristics and fitness level of the subjects. The data gathered were analysed by descriptive statistics of frequency count and percentage to analyse the bio-data and research questions, while inferential statistics of t-test was employed to analyse the hypotheses at 0.05 alpha level. Findings revealed that, no significant differences existed between the students of public and private secondary schools in their fore arm length, height and arm spam length. Whereas, there are differences existed between students of public and private secondary schools in their weight, cardio-respiratory endurance and muscular endurance. It was recommended that physical assessment and screening should be carried out by health educators in school on a regular basis among the secondary school students, so as to quickly detect any deviation from normalcy, fitness program should be included in the school curriculum to make students fit for their daily activities and parents should advise their children on the benefit of spot day and leisure time should be meticulously used.

Keywords: physical characteristics, fitness level, secondary school students, weight, forearm height, arm spam, cardio respiratory endurance, muscular endurance.

INTRODUCTION

Physical Characteristics connotes rapid growth in muscular development at a faster rate and soon. These changes starts around 10years of age and the changes which take place in boys during adolescents are slightly different from these that of girl (Viners, Christies & Deborah, 2005). The activity of the pituitary gland at this time result in the increased secretion of hormones, with spread physiological effects, growth hormones produce a rapid growth spurt, which brings the body closer to its adult height and weight in about two years. The growth spurt occurs earlier among female and mature sexually earlier than male, attainment of sexual maturity in girls is marked by the onsets of menstruation and in the boys by the production of semen (Cooney2010).

Fitness is generally defined as the ability of a person to live a happy, well-balanced life. It embraces the physical, intellectual, social and spiritual aspects of a person's life. It is a relative term, depending on individual circumstances and for what a person needs to be fit. Fitness has health-related components and skill components which include; aerobic fitness, muscular strength, muscular endurance, flexibility and composition (Olaitan, 2005). Skill -related components include agility, balance, coordinate, speed, power and reaction time (Wilmore, and Costill, 2002).

Anthropometry

It can be described as body measurement research; it is use to study individual Body mass Index (BMI), height, weight, arm, wrist, sitting height to standing height which is sometimes called leg-length to trunk length (Hoek, 2006).

What is Fitness?

Wilmore and Costill (2002) define fitness as a concept which implies a mental and physical state of balance which allows an individual to function to his or her best ability in all aspects of life. Physical fitness is not just a general term like good health but a specific one. To a layman, physical fitness may be bulging muscles: to the physician it may be absence of disease. Whereas, to the physical and health educator, it means an adequate acquisition and demonstration of strength, speed, agility, endurance, co-ordination, power, balance, flexibility and body control (Lafinhan & Olaitan, 2005). Cardio-Respiratory Endurance (CRE) refers to the ability of the heart to get oxygen and rich blood to the required working muscles. It also means the ability to maintain a steady pace of exercise without reaching a high level of fatigue and tiredness (WHO, 2005). Muscular Endurance refers to how a muscle can continue to perform repeated movement without fatigue or hold a position without losing the position (www.ezinearticles.com, 2008). Marks (2008),

opined that muscular endurance is related to muscular strength but different in many ways. The pathway utilized by muscular endurance is more of glycolysis and oxygenated pathways while that of the muscular strength would be more of ATP-PC and some glycolysis.

PURPOSE OF THE STUDY

1. To investigate the differences in the physical characteristics (height, weight, fore arm length and arm span) of students in public and private secondary schools in Kwara State.
2. To assess the differences in the fitness level of students in public and private secondary schools in Kwara State.

RESEARCH QUESTIONS

1. Is there any difference in the physical characteristics (height, weight, fore arm length and arm span) of students in public and private secondary schools in Kwara State?
2. Is there any difference in the fitness level (cardio respiratory and muscular endurances) of students in public and private secondary schools in Kwara State?

RESEARCH HYPOTHESES

- Ho1: There is no significant difference in the weight of students in public and private secondary schools in Kwara State, Nigeria.
- Ho2: There is no significant difference in the fore arm length of students in public and private secondary schools in Kwara State, Nigeria.
- Ho3: There is no significant difference in the standing height of students in public and private secondary schools in Kwara State, Nigeria.
- Ho4: There is no significant difference in the arm span of students in public and private secondary schools in Kwara State, Nigeria.
- Ho5: There is no significant difference in the cardio respiratory endurance of students in public and private secondary schools in Kwara State, Nigeria.
- Ho6: There is no significant difference in the muscular endurance of students in public and private secondary schools in Kwara State, Nigeria.

METHODS AND MATERIALS

Experimental design was used to conduct the research for the students of public and private schools in Kwara State, Nigeria. The population for this study comprised all students in selected public and private secondary schools in Kwara State, Nigeria. Purposive sampling method was used to select eighty (80) students who voluntarily wish to participate in the study after signing the consent form because of ethical consideration. The tools used for the study are standardized instruments and facilities which include:

measuring tape, stop watch, whistle, weighing scale, stadiometer bar and a standard athletic track. Reliability of the instrument was done by carrying out a pilot study by using the instruments on 10 subjects (5 from public and 5 from private secondary schools) in Ibadan, Oyo State, Nigeria. Data collection was done by taking the measurements of the subjects and recording the performances in the appropriate columns. Researchers and 4 trained research assistants did these according to the guidelines stated for the conduct of the research. The procedure and variables from which data were obtained include:

A. Physical Characteristics (Measurement)

- ❖ **Age:** The age of each participant was taken and recorded.
- ❖ **Height:** The participants were measured with a stadiometer bar and their heights were taken to the nearest centimeter and were recorded.
- ❖ **Weight:** The weights of the participants were taken on a weighing scale that was placed on the level surface and adjusted before usage. The subject made stand upright and their hands perfectly by their side. The weight was recorded in kilograms.
- ❖ **Arm span:** The subjects were made facing away from the wall, with back and buttocks touching the wall, arms are stretched out horizontally. Measures from one furthestmost finger tip to the other. The arm span was recorded in centimeters.
- ❖ **Forearm:** The subjects were made stand facing away from the wall, with back and buttocks touching the wall, the right arm was stretched out horizontally was measures from elbow joint to the finger tip. The forearm length was recorded in centimeter.

B. Fitness Test Administration

- ❖ **Cardio Respiratory endurance:** 12minutes walk/run test. Equipment:- Stop watch and whistle
Location: - School open /a standard athletic track
Purpose: - To cover the maximum distance within the allotted time frame

PROCEDURE

- Subjects positioned themselves at the starting point on the track.
- Once in a ready position, at blast of the whistle they started the race and the stop watch started counting.
- At the end of 12minutes, the whistle was blown for the subjects to stop and remain in their positions until the data was recorded in metres.
- An appropriate cool down was initiated.
- i. **Muscular Endurance:-** Squat jumps
Equipment – whistle and recorders

Location – school hall
 Purpose: - To evaluate the lower extremity muscular endurance.

PROCEDURE

- Subjects assumed a squat position with one foot beside the other and the hands’ fingers crossed placed behind the neck, everybody on a vertical line and go together.
- Once in a ready position, the researcher blew the whistle to start and the stop watch started simultaneously.
- The students jump up high into the air and alternate their position before landing in squat position again.
- The seconds performed by each subjects were recorded for each of them, until they could not continue again and there was no stoppage between the activities.
- The seconds of rounds performed by each subject was recorded by the researcher and research assistants.

Descriptive statistics of frequency counts, mean, standard deviation and percentage, also inferential statistics of t-test was used to test the significant differences in the variables between the students of public and private schools in Kwara State, Nigeria at 0.05 alpha level.

RESULTS AND DISCUSSIONS

Table 2: t- test results on the analysis of physical characteristics and fitness level of students in public and private secondary schools in Nigeria N=80

Hypothesis/ Variable	School Type	Number of Participant	Mean (X) Score	Standard Deviation(SD)	Calc. t Value	Table Value	Decision
1.Weight(kg)	Public	44	44.50	7.05	2.76*	1.68	Sig.
	Private	36	50.37	9.74			
2. Fore arm length(cm)	Public	44	41.61	6.98	1.63**	1.68	NS.
	Private	36	42.73	7.01			
3. Standing height (cm)	Public	44	152.8	1.57	1.31**	1.68	NS
	Private	36	153.3	1.59			
4. Arm span(cm)	Public	44	154.6	1.61	1.42**	1.68	NS
	Private	36	155.2	1.64			
5.Cardio Respiratory Endurance (cm)	Public	44	38674	62.15	34.42*	1.68	Sig.
	Private	36	32796	31.73			
6.Muscular Endurance (sec)	Public	44	372.21	28.19	5.67*	1.68	Sig.
	Private	36	234.89	19.99			

p≤0.05, *=significant (sig.), **= not significant (NS)

Table 2 shows recorded measurements of the variables in the study and test of differences the existed between the students of public and private secondary schools in Kwara State. The mean (X) weight of the students in public schools (44.50kg) and private school (50.37kg), produced SD 7.05 and

Table 1: Percentage distribution of respondents by selected characteristics

Characteristics	Frequency (Percentage) N=80
School type	
Public	44 (55)
Private	36 (45)
Gender	
Boys	40 (50)
Girls	40 (50)
Age (in years)	
11-12	10 (12)
13-14	42 (53)
15-16	28 (35)
Class	
JSS I	12 (15)
JSS II	14 (17.5)
JSS III	14 (17.5)
SSS I	12 (15)
SSS II	14 (17.5)
SSS III	14 (17.5)
Total	80 (100)

Table 1 shows the percentage distribution of respondents thus; of the 80 total respondents, 44(55%) are from public school and 36(45%) are from private school. Boys and girls constitute 40(50%) each, and the respondents are within ages 11-12years, 13-14years and 15-16years representing 10(12%), 42(53%) and 28(35%) respectively. The respondents are from different classes as follows; JSSI (15%), JSSII (17.5%), JSSIII (17.5%), SSSI (15%), SSSII (17.5%) and SSSIII (17.5%) (see Table1).

9.75 respectively. With this, a t-test result of 2.76 was obtained, which is greater than the Table Value (1.68) at 0.05alpha level of significant. In that sense, Hypothesis 1 was rejected, meaning that significant differences existed in the weight of the students in public and private secondary schools in Kwara State,

with the students of private schools having higher weight than those in the public secondary schools. This finding is contrary to the statement of Debbie (2006) that the pubertal weight spurt is predominantly due to increase in number and size of adiposities, this does not mean there should disparity in the weight of the same sex and age group.

The fore arm length mean scores of students of public and private secondary schools are 41.61cm and 42.73cm, while the SD is 6.98 and 7.01 respectively with a t-test result of 1.63 at 0.05 alpha level which is less than the Table Value of 1.68. In this case, Hypothesis 2 was accepted, meaning that no significant difference in the fore arm length between the students of public and private secondary schools in Kwara State. This finding corroborates with Viners, Christies, Deborah (2005) that changes start around 10years of age and the changes which take place in boys during adolescents are slightly different from these that of girls, but do not mean that differences are expected in forearm length of the students regardless of their school types.

On the height of the respondents, students from public school have mean height of 152.8cm and private have 153.3cm; their SD is 1.57 and 1.59 respectively, showing a t-test result of 1.31 at 0.05 alpha level which is less than the Table Value of 1.68. In this case, Hypothesis 3 was accepted, meaning that no significant difference in the height of the students of public and private secondary schools in Kwara State. This is supported by Viners et al (2005), Hoek (2006), and Cooney (2010) who all opined that heights of adolescents of the same age group is more or less the same, but tend to increase as the age increases.

The mean arm span of both the students of public and private schools are 154.6cm and 155.2cm, SD is 1.61 and 1.64 respectively, while calculated t-test is 1.42 which is less than the Table Value of 1.68. This implies that Hypothesis 4 was accepted, thus no significant difference between students of public and private secondary schools in their heights. This outcome is in line with the statement that, on the average, arm span should be equal to height (<http://www.topend sports.com>, 2012).

On the cardio respiratory endurance of students of both public and private secondary schools in Kwara State, the mean scores are 38674cm and 32796cm respectively, SD is 62.15 and 31.73 respectively, while the t-test score is 43.42 at 0.05 level of significant which is greater than the Table Value of 1.68. Hypothesis 5 was rejected, this implies that a significant difference existed between students of public and private secondary schools in Kwara State based on their cardio respiratory endurance. This finding is contrary to the findings of Olaitan (2001)

on evidence of elevated blood pressure among secondary school students in Ilorin that, the general fitness and activity levels of students are the same and help to improve their cardio vascular and muscular endurance.

Hypothesis 6 was also rejected, because the calculated t-test of 5.67 is greater than the Table Value (1.68) at 0.05 significant level. The mean scores of the muscular endurance of students of public school are 372.21sec and private school is 234.89sec, SD is 28.19 and 19.99 respectively. This means that students of public and private secondary schools in Kwara State are significantly different in their muscular endurance. This finding opposes the findings of Olaitan (2001) that students of secondary schools in Ilorin are relatively the same in their muscular strength which is an index of their muscular endurance.

CONCLUSION AND RECOMMENDATIONS

Based on the findings from the study, it was concluded that, there are no significant differences between students of public and private secondary schools in Kwara State in some of the variables of physical characteristics, such as fore arm length, height and arm span. Whereas, there existed a significant difference between the students of public and private secondary schools in Kwara State in a variable of physical characteristics, which is weight. Significant differences existed between the students of public and private secondary schools in Kwara State in the variables of fitness level, which are cardio respiratory endurance and muscular endurance.

Based of the findings and conclusions, the following recommendations were made:

1. There should be a regular physical assessment and health screening appraisal for students in schools so as to quickly detect any deviation from normalcy to make immediate correction.
2. The school should engage in fitness programme for students on regular basis at both senior and junior classes so as to develop good cardio respiratory and muscular endurance of the students.
3. The school should ensure that the sport day in school is properly utilized by the students and not to use the time for something else, except sporting activities, so that the students can gradually develop interest in physical and health education programmes, in order to promote better physical development.
4. Parents should encourage their children to make good use of their leisure hours by reducing time-taking sedentary activities like computer game, chess, playing cards, ludo and so on. But, encourage participation in domestic work. This

will help minimize sedentary lifestyle of the children.

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