

## **COMPARISON OF PHYSICAL FITNESS LEVEL OF DAY AND BOARDING SCHOOL STUDENTS IN OFFA, OFFA L.G.A.**

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### **Abstract**

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. The study compared the physical characteristics and fitness levels of day and boarding students in Offa Local Government Area, Kwara State. The population for this study comprised 210 students in day and boarding schools in Offa LGA. Systematic sampling technique was used to select 20 students each from day and boarding school. Ex-post facto research design was adopted for the study, Standardized instrument (stadiometer, body fat/hydration monitoring scale, measuring non-elastic tape, stop watch, whistle, floor mat, sit and reach box) were used for the study. Split half method was used to ascertain the reliability of the instrument and a correlation coefficient of 0.63r was obtained. Descriptive statistics of mean and standard deviation and inferential statistic of t-test were used to analyse the data . It findings revealed that boarding students were taller than the day students while both groups were physically fit and healthy. Furthermore, day and boarding students were significantly different in their cardio-respiratory endurance while both were not significantly different in muscular strength and body flexibility. It was therefore recommended that there should be a regular physical fitness assessment and screening consideration for students in day and boarding schools for early detection of any deviation from normalcy to take immediate corrective action while the school should organise physical fitness programme for all students on regular basis to develop their cardio respiratory endurance, muscular strength and body flexibility.

**Key Words:** Muscular, Strength, Flexibility, Fitness

### **INTRODUCTION**

Physical fitness is a well-being physiological condition that enables one to meet the demands of daily life or provides the basics for success in sport. It is a set of characteristics that are either related to health or related to skills. Therefore, it is not only required for better performance by athletes, but also for everyone to maintain a healthy body and sound mind. Physical fitness refers, according to Odebiyi, Tella and Oginni (2013), to the optimal functioning of all the body's physiological systems, particularly the cardiovascular, pulmonary, and musculoskeletal systems.

Physical fitness has often been viewed as the capacity of the body to function effectively and efficiently, a state of being consisting of at least five components related to health and six components related to skills, each of which contributes to the overall quality of life. It is related to the ability of a person to work efficiently, enjoy recreation, be safe, avoid hypokinetic diseases and cope with emergency situations (Pramanik & Pramanik, 2001). A fit person is able to complete the usual daily routine and still has enough reserve energy to fulfill other daily recreational sports requirements, satisfying leisure activities in relationships, and has sufficient energy to manage life's emergency or crisis situations as they occur.

The advantages of physical exercise are numerous, regardless of age, gender, or skill, and should be tailored to meet personal needs and interests for life. Lafinhan and Olaitan (2005) claimed that aerobic ability, body composition, muscular strength, muscular endurance and flexibility are included in health-related fitness. In children and adults, each of these dimensions is connected to overall health. For example, to reduce the risks of heart disease, diabetes, and strokes, aerobic ability is important. In improving functional capability, strength and flexibility are essential. Agility, pace, agility, balance, strength, and reaction time are included in skill-related fitness. For success in certain sports, these dimensions are significant, but they also indirectly contribute to individual health status. In order to carry out physical activity as they become adults and reap the benefits of a physically active lifestyle, it is still necessary for children to learn physical skills.

Health related physical exercise refers to components important to a desirable health status. Health fitness means the ability to conduct everyday operations with energy characteristics and capabilities that reduce the likelihood of chronic disease development and premature death. This depends heavily on the individual's degree of physical activity (Ruiz, Castro-Pifiero, Artero, Ortega, Sjostrom, Suni, & Castillo, 2009). One of the most important components of health-related fitness is the cardio respiratory portion. It is a clear measure of an individual's physiological status that reflects the overall capacity of the cardiovascular and respiratory systems to provide oxygen during long-term physical activity and reflects the ability to perform long, strenuous exercise (Ruiz, Ortega, Gutierrez, Meusel, Sjostrom, & Castillo, 2006).

Insel and Roth (2002) suggested that cardio-respiratory endurance depends on factors such as the ability of the lungs to provide oxygen to the bloodstream from the atmosphere, the ability of the heart to pump enough blood, the ability of the nervous system, the blood vessels to regulate blood flow, the ability of the muscles to produce electricity, and the ability of the chemical processes of the body to use oxygen and p If aerobic fitness levels are low, during regular everyday

activities, the heart has to work very hard and may not be able to work hard enough to maintain physical activity of high intensity in an emergency situation.

Physical movements strengthen the respiratory system and the cardiovascular system. Physical activity and health can contribute significantly to the treatment of illness or disease. People still fall ill even with the best disease-prevention methods. For certain hypokinetic disorders such as diabetes, heart attack, back pain, among others, daily exercise and good health have been shown to be effective in alleviating symptoms and helping recovery after illness. Health and wellbeing promotion strategies are physical activity and exercise. They contribute to the wellness-related quality of life, which is the positive aspect of good health (Corbin, Linsey, Welk, & Corbin, 2002). The rhythmic use of large muscle groups for an extended period of time, such as jogging, walking, cycling, aerobic dancing and other types of group exercise, includes cardio-respiratory endurance exercises.

Dipayan, Soma and Vasant (2002) suggested that kids in boarding school are more physically fit than their counterparts in day school. This can be due to daily school physical activity in which studies have shown that kids who participate in regular endurance training have greater physical health than kids who are more sedentary. Bakinde, Olaitan, Ajayi-Vincent and Ibrahim (2013) have also reported that there is a substantial gap in cardio respiratory and muscular endurance between students at public and private secondary schools in Kwara State. Studies, however, found a substantial difference between the standards of girls' cardio-respiratory endurance fitness in daytime and boarding school. The day girls were also fitter than their boarding counterparts in cardiovascular stamina, as disclosed by Odebiyi et al (2013).

For the body to achieve work, muscular strength is necessary. It is the muscles' capacity to exert full strength against resistance. It is defined by short-term intensity operations (Debbie, 2011). The maximum amount of force that can be applied in a single contraction concerns muscle strength. Corbin et al., (2002) defined muscular strength as the quantity of force that a muscle group can generate with a single maximum effort.

In leisure sports, muscular ability has obvious significance. Powerful individuals can hit a tennis ball faster, kick a soccer ball more, and ride a bicycle uphill more quickly. For the smooth and easy performance of daily activities such as lifting boxes, climbing stairs and emergency situations, strong muscles are essential (Adeniyi & Abdullahi, 2007).

Muscle strength is important in daily living activities, preserving functional health and promoting good posture, particularly in the upper body. As a person ages, the importance of muscle strength in preserving functionality becomes more apparent. The value of strength as well as strategies

to be used in improving and sustaining this area of fitness must be understood by children and young people. Bakinde, Olaitan, Oyetunji and Bakinde (2016) suggested that muscle strength is a health indicator for both athletes and non-athletes, which can contribute to changes in the fields of fitness, injury prevention, body structure, self-image, and muscle and bone health for life.

Flexibility was described by Olaitan (2005) as the movement of a joint across a full range of motion. For smooth, efficient movement, flexibility is necessary and can help prevent ligament and joint injuries. The human body is versatile naturally, but flexibility appears to decline as they advance in age. Loss of range of motion is responsible for disuse, injury, excessive body fat and muscle imbalances. The shape of the bones and cartilage in the joint and the length and flexibility of the muscles, tendons, ligaments and fascia which cross the joint determine flexibility.

Flexibility is affected by a variety of factors, including age, gender, race, job or occupation. When children grow older, when they become increasingly less flexible, their resilience increases until puberty. Girls tend, as a general rule, to be more versatile than boys. This is possibly due to physical variations in the joints, as well as the disparity in the form and variety of behaviors that the two sexes choose to choose from.

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Hoek (2006) concluded that the height of adolescents in the same age group is more or less the same, but appears to rise as age increases. Debbie (2011) believed that pubertal weight spurts are primarily due to a rise in the number and size of adiposities, which does not mean that individuals of the same sex and age should have a difference in weight. Musa, Ismaila, Adejuyigbe, Akinyemi and Abolarin (2012) indicated that the heights are more or less the same for adolescents of the same age group, but appear to rise as age increases.

### **Statement of the Problem**

Based on experience as a teacher, it has been noted that during staff meetings, there are frequent complaints of sickness by the students in the boarding house has gradually become a discussion topic. There is no single day from the start of the term that a student is not placed in the sick bay or referred to hospitals. This is not a peculiar issue for a school, but a common problem that has arisen among boarding house students. Bakinde et al (2013) stated that there is a substantial gap in cardio respiratory and muscular endurance between students from public and private secondary schools in Kwara State. Studies, however, have found a substantial gap between

girls' cardio-respiratory endurance fitness rates in the day and girls' boarding school. Odebiyi et al., (2013) suggested that day girls were fitter than their boarding counterparts in cardiovascular endurance.

However, the frequent trips to the sick bay and hospitals of students in boarding school go a long way to influence their academic work and also placed undue pressure on the housemasters and housemistresses who accompany them to the hospitals. The cause of students' persistent illness could be attributed to their levels of physical health. This prompted the researcher to perform a study to compare the level of physical health of day and boarding school students in Offa, Offa LGAA.

### **Hypotheses**

1. In St Claire Anglican Girl's Grammar School, Offa, Offa LGA, there is no substantial difference between the physical characteristics (age, height, weight & BMI) of day students and the boarding section.
2. In St Claire Anglican Girls' Grammar School, Offa, Offa LGA, there is no substantial difference between the physical fitness level (cardiorespiratory stamina, muscular strength & flexibility) of day students and the boarding section.

### **METHODOLOGY**

Ex-post facto research design was adopted for this study, this is because measurements of variables or characteristics are already in existence and reporting them as measured. Ex post facto research design does not involve any form of manipulation because the facts being measured have already occurred. The population for this study was 210 students in Secondary schools. Offa Local Government Area. Systematic sampling technique was used to select 20 students in day and boarding school each using their register.

The instrument used for this study were standardized instrument which include weighing scale, stadiometer, standard athletic track, cones, measuring tape, stopwatch, sit and reach box, mats, and whistle. These instruments were already calibrated and tested. To ascertain the reliability of the instruments, split half method was used. Ten participants from Ansar-ud-Deen College were used. The data collected were split into two halves for correlational analysis using Spearman Rank Order. The result obtained was 0.63r. This indicates that the instrument were reliable enough to carry out the study. Physical fitness tests were administered on standard four hundred meter track (400 m). Test location was the St Claires Anglican Girl's Grammar School premises. Scores

obtained from each variable were recorded by the research assistants. Variables to which data was obtained include age, weight, height, cardiorespiratory endurance, Muscular strength and flexibility.

### **Procedure for Data Collection**

**Age:** The school registration form was used to determine the age of the participant

#### **Height**

**Equipment:** Stadiometer.

**Procedure:** The height of the participants was measured using stadiometers portion of the health-O-meter scale. The subjects stood bare footed backing a rigid upright, feet together, arm and shoulder kept relaxed and looking forward horizontally. A ruler was placed on the vertex of the head to touch the upright at the back. The measurement was taken three (3) times and the mean of the measurements was recorded to the nearest 0.1cm.

#### **Weight**

**Equipment:** Body fat/Hydration monitoring scale

**Procedure:** the participants were measured under light clothing and without shoes, standing on the scale arms hanging by the side in a relaxed position and looking forward. The measurement was three (3) times and the mean of the measurements was recorded to the nearest kilogram (kg).

#### **Body Mass Index (BMI)**

This was calculated using  $\text{weight (kg)} \div \text{height (m)}^2$  and it was recorded to the nearest 0.01 kg/m<sup>2</sup>.

**Cardio-respiratory Endurance** — Miller 20m run test for 5minutes.\

**Equipment:** athletic track, marking cones, measuring tape, stopwatch and whistle.

**Location:** St Clares Anglican Girl's Grammar School premises

**Purpose:** to cover as much distance as possible in five minutes.

**Procedure:** At the start, participant line up behind the starting line, on the command 'GO' the stopwatch started counting and the participants began to run at their own pace. The stopwatch was stopped at the end of 5 minutes

**Score:** total number of distance covered in five minutes was recorded

**Muscular strength** — push-up (30 seconds)

**Equipment:** floor mat, stopwatch and whistle

**Location:** St Clares Girl's Grammar School premises

**Purpose:** To test the strength of the upper body.

**Procedure:** Hands and toes touching the floor, the body and legs in a straight line, feet slightly apart, the arms at shoulder width apart, extended and at a right angles to the body. Keeping the back and knees straight, the participant lowers the body till there is a 90-degree angle at the elbows, then returns back to the starting position with the arms extended.

**Score:** number of correctly completed push-ups were recorded

**Flexibility** — Sit and Reach test

**Equipment:** sit and reach box

**Location:** St Clares Anglican Girl's Grammar School premises

**Purpose:** to measure the flexibility of the lower back and hamstrings

**Procedure:** Participant sit on the floor with legs stretched out straight ahead and shoes removed. The soles of the feet are placed flat against the box. Both knees locked and pressed flat to the floor with the palms facing downwards, and the hands on top of each other. The participant reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. The participant reaches out and holds that position for two-three seconds while the distance reached is recorded. The researcher ensures that there were no jerky movements.

**Score:** the last point reached by the hand was checked on the box and recorded to the nearest centimeters

The data collected was coded, sorted and analyzed with the use of Statistical Package for Social Sciences (SPSS), version 20.0. Descriptive statistics of mean and standard deviation were used to describe the data collected. The data was also subjected to t-test which was used to test the stated hypotheses at 0.05 alpha level.

## RESULTS

**Table 1:** t-test Analysis of Physical Characteristics of the Participants

Variables	Day Students X $\pm$ SD	Boarding Students X $\pm$ SD	df	t-value	p-value	Decision
Age (years)	15.05 $\pm$ 0.99	15.2 $\pm$ 1.11		0.429	0.673**	
Height (M)	1.57 $\pm$ 0.066	1.62 $\pm$ 0.049		2.708	0.0014*	
Weight (Kg)	54.3 $\pm$ 8.02	55.5 $\pm$ 5.3		0.533	0.6**	
BMI (Kg/m <sup>2</sup> )	22.2 $\pm$ 3.29	21.3 $\pm$ 2.26		0.982	0.339**	



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$p \leq 0.05$ , \*=significant (sig.), \*\*=not significant (NS)

Table one reveals the physical characteristics of the participants in day and boarding school. The age, height, weight and BMI of day students were compared with the boarding students. The mean age for day students is 15.05 and that of boarding students is 15.2, thus difference of 0.15 and calculated t-value of 0.429 with p-value of 0.673. This value is not significant at 0.05 alpha level. This implies that both day and boarding students are not significantly different in their ages which connotes that they are averagely of the same age. The mean height for day students is 1.57 and that of boarding students is 1.62, thus difference of 0.05 and calculated t-value of 2.708 with p-value of 0.0014. This value is significant at 0.05 alpha level ;meaning that both day and boarding students are significantly different in their height, the boarding students are taller than the day students. The mean weight for day students is 54.3 and that of boarding students is 55.5, thus difference of 1.2 and calculated t-value of 0.533 with p-value of 0.6. This value is not significant at 0.05 alpha level, meaning that both day and boarding students are not significantly different in their weight, they are averagely the same weight. The mean BMI for day students is 22.2 and that of boarding students is 21.3, thus difference of 0.9 and calculated t-value of 0.982 with p-value of 0.339. This value is not significant at 0.05 alpha level, therefore, both day and boarding students are not significantly different in their BMI, both of them are apparently healthy.

**Table 2: t-test Analysis of Physical Fitness Parameters of the Participants**

Variables	Day Students X ±SD	Boarding Students X ±SD	df	t-value	p-value	Decision
Cardio-respiratory	21.35±1.23	19.2±1.58		-4.09	0.001*	
Muscular Strength	10.6±3.12	10.8±4.39		0.237	0.815**	
Flexibility	29.5±5.08	29.5±6.53		0.00	1.000**	

$p \leq 0.05$ , \*=significant (sig.), \*\*=not significant (NS)

Table two reveals the physical 'fitness variables of the participants in day and boarding school. The cardio-respiratory endurance, muscular strength and flexibility of day students were compared with the boarding students. The mean cardio-respiratory endurance (Miller 20m run test for 5minutes) for day students is 21.35 and that of boarding students is 19.2, thus difference of 2.15 and calculated t-value of -4.09 with p-value of 0.001. This value is significant at 0.05 alpha level, the day and boarding students are significantly different in their cardio-respiratory endurance. Also, the

mean for muscular strength (push up for 30seconds) for day students is 10.6 and that of boarding students is 10.8, thus difference of 0.2 and calculated t-value of 0.815 with p-value of 0.815. This value is not significant at 0.05 alpha level. This means that day and boarding students are not significantly different in their muscular strength. Furthermore, the mean for flexibility (sit and reach test) for day students is 29.5 and that of boarding students is also 29.5, thus their flexibility is at par and calculated t-value of 0.000 with p-value of 1.000. This value is not significant at 0.05 alpha level, Therefore, the day and boarding students are not significantly different in their body flexibility.

## **DISCUSSION**

The findings revealed that there is no significant difference in the age of the participants even though the day students were younger than the boarding students in their mean age, the difference is not significant. This could be as a result of the fact that the students were selected from the same class in the same school which is more or less homogenous group. This finding is in line with that of Mohammed (2014) who concluded that students are basically the same in their age when they are selected from a group that is homogeneous.

The findings further showed a significant difference in the height of the participants, the boarding students were taller than the day students in their mean height, and there is a significant difference between their heights. This may be connected to the background of these students. Most boarding students are from the middle and upper class citizens and are well fed compared to day students in which majority are from lower-class citizens. This finding differs from that of Bakinde et al., (2013) who found no significant difference in the height of the students of public and private secondary schools in Kwara State. This is supported by Musa et al., (2012) who 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 findings also revealed no significant difference in the BMI of the participants although both of them have a healthy and normal BMI but the difference is not significant. This could be attributed to their weight which is a major factor for insignificant difference. This finding is in line with Odebiyi et al., (2013) who stated that reduced BMI promote quality of health related physical fitness of school aged children.

The result showed a significant different in the cardio-respiratory endurance of the participants using Miller 20m run test for 5minutes, the day students covered a mean distance of 21.351aps compare with their boarding counterpart with mean distance of 19.21aps and there is a significant difference between their cardio-respiratory endurance. This may be attributed with the

distance trekked by day students (to and from) their various home to school every week days. This finding is in agreement with Pramanik and Pramanik (2001) cited by Odebiyi et al., (2013) who found a significant difference between the cardiorespiratory endurance fitness levels of girls in day and boarding girls' school and concluded that day girls students were fitter in cardiovascular endurance than their boarding counterparts.

The findings revealed no significant difference in the muscular strength of the participants using push up for 30seconds, in which the day and boarding students have an average of 10.6 and 10.8 respectively and no significant difference existed between their muscular strength which may be attributed to their homogeneity in terms of weight and other physical characteristics. Simonen, et al. (2003), who stated that Muscles Mass contributes to raw muscular strength of the body which has significant and benefits to fitness and weight loss. Muscular strength utilizes ATP-PC and some glycolic energy pathways, and anaerobic exercise improves muscular strength. Also, increasing muscle mass will help maintain a normal weight and avoid accidents that are more likely with weak muscles.

The findings also revealed no significant difference in the flexibility level of the participants using sit and reach, in which the day and boarding students have an average of 29.5 each and no significant difference existed between their levels of flexibility. This finding is in contrast with (Olaitan, 2005) who stated that day students are more flexible than the boarders, the differences could be explained by the vigorous daily activities that the day girls go through as routine at home. Activities such as sweeping, washing and cleaning of all types of things, walking briskly to and from school and involvement in indoor and outdoor games both in school and at home render the day girls more flexible than their boarding counterparts. The boarders on the other hand do not engage in any strenuous activity while on campus. Most of the vigorous activities are done by the first years. Also, Bakinde et al., (2016) opined that active people are more flexible and healthier than inactive individuals.

## **CONCLUSION**

Based on the findings of this study, it was concluded that, there are no significant differences between day and boarding students in the selected physical characteristic variables, such as age, weight and BMI. Whereas, there is significant difference in physical characteristics of height. Also, no significant differences between day and boarding students in the selected physical fitness variables of muscular strength and flexibility while there is significant difference in their physical fitness of cardio-respiratory endurance.

## RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

1. There should be a regular physical fitness assessment and screening for students in day and boarding schools Offa LGA for early detection of any deviation from normalcy to take immediate corrective action.
2. School administrators in Offa LGA should organize physical fitness programme for day and boarding students on regular basis at both senior and junior classes so as to develop their cardiorespiratory endurance as well as muscular strength and body flexibility of the students.

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