INFLUENCE OF PHYSICAL ACTIVITY LEVEL ON THE HEALTH STATUS OF ATHLETES AND NON-ATHLETES STAFF MEMBERS IN ADEYEMI COLLEGE OF EDUCATION, ONDO

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Abstract

This study investigated the influence of physical activity on the health status of staff members in Adeyemi College of Education, Ondo. Ex-post facto research design was used in the study. The population of the study comprised 1,112 staff members of Adeyemi College of Education, Ondo. A sample of 133 participants was selected for the study. Stratified sampling technique was used to categorise staff members into athlete and non-athlete categories. Purposive sampling technique was used to select 30 staff athletes, and random sampling was used to select 103 staff non-athletes. The physical activity questionnaire used for this study was adapted from the International Physical Activity Questionnaire (IPAQ). Standardized instruments of body weight scale, stadiometer, and non-elastic tape rule were used for measurements of body weight (kg), height (metre), waist circumference (cm), and hip circumference (cm). Inferential statistics of Independent sample t-test were used in testing the postulated hypotheses at .05 alpha level. The findings revealed a significant difference in the physical activity level between staff athletes and non-athletes at Adeyemi College of Education, Ondo. (The results indicate a significant difference in the health status markers (BMI, WHR, and WHtR) between staff athletes and non-athletes at Adeyemi College of Education, Ondo. MI (t(131) = -6.45, p(0.03) <.05), WHR (t(131) = -5.15, p(0.03) <.05), WHtR (t(131) = -6.48, p(0.04) <.05); there is no significant difference between the health status marker (WC) of staff athletes and non-athletes in Adeyemi College of Education, Ondo. (t(131) = -7.21, p(0.40) >.05). The study's findings revealed that staff athletes actively participated in physical activity within the WHO's (2010) recommended range, while the majority of non-athlete staff members had risky health conditions. Among other recommendations, we should develop a workplace culture and environment that supports and motivates employees to be physically active, and encourage regular engagement in physical activities at moderate to vigorous intensity to promote the health and fitness of all staff at Adeyemi College of Education, Ondo.

Introduction

An active lifestyle presents a myriad of potentials that end up benefiting the health of man. Undoubtedly, the maintenance of optimal health has consistently linked physical activity to major lifestyle behaviors. Umeifekwem (2011) defines physical activity as an informal yet well-structured form of sport, recreation, or hobby, unrelated to one's regular work duties. Physical activity, as defined by Umeifekwem (2011), is an endeavor that involves physical exertion, resulting in health benefits. (Joshua, 2012).

Regular physical activity brings about physical fitness, which is necessary for the growth and development of an individual and plays an important role in improving and preserving human health (Cordova, Gerarod, Antoni, Jose & Maria, 2012). Physical activity (PA) is associated with reduced risk of coronary heart disease and cardiovascular disease mortality in both men and women and in middle-aged and older individuals.

Okafor, Young, and Nwobi (2016) described cardiovascular diseases (CVDs) as diseases that involve the heart and the blood vessels, with the basic trigger of the disease being arteriosclerosis. Arteriosclerosis usually occurs following the presence of risk factors like high blood pressure, smoking, lack of exercise, and obesity, among others. Cardiovascular diseases are the leading cause of death globally, and in Nigeria, the World Health Organisation (WHO, 2018a) reported that they accounted for 108,578 deaths (5.6%) in 2018 alone.

The world is witnessing a significant increase in the global burden of non-communicable diseases (NCDs) such as stroke, cancer, hypertension, obesity, diabetes, and chronic respiratory diseases (Elendu & Akpan, 2012). Regular physical activity can reduce the risks of all these diseases, making them preventable. The World Health Organisation (WHO) (2018b) described physical activity as an important determinant of health associated with reduced risk of chronic diseases such as cardiovascular disease, diabetes, obesity, and certain forms of cancer and improved mental health and quality of life.

In Nigerian government establishments, including universities, the age and length of service of the workforce range from 18 to 65/70 years for academic staff and 18 to 60/65 years for non-academic staff. Elendu and Akpan (2012) have recommended certain physical activities to ensure employees' optimum health and wellness during and after active service. According to WHO (2010), the recommended PA for adults aged 18 to 64 years includes leisure time activities such as walking, dancing, gardening, hiking, and swimming; transportation activities such as walking and cycling; occupational activities such as work; household chores, play, games, sports, or planned exercise, all within the context of daily, family, and community activities.

To prevent diseases such as cardiovascular disease, diabetes, and obesity among tertiary institution staff, schools provide a conducive environment for sporting activities, encouraging staff and students to engage in regular physical activity. Tertiary institutions provide various facilities and equipment such as tennis courts, volleyball courts, soccer pitches, and athletic track and field, among others. As individuals age, their participation in physical activity decreases, and only those who integrate into an active lifestyle continue to participate as they age. Taking part in sports can be an important motivator for physical activity for older people even in tertiary institutions leading to a greater number of people being physically active both in leisure and in organized sports (Baker, Fraser-Thomas, Dionigi & Horton, 2010).

Metabolic Equivalent Task (MET) is a measure of energy expended during physical activity. One MET is defined as the amount of oxygen or calories consumed while sitting quietly. Light-intensity physical activities have only minor effects on heart and breathing rates. It is measured as 1.6 to < 3 METs. Moderate-intensity physical activities elevate the heart and breathing rate to between 50.0% and 70.0% of their maximum levels. Aerobic metabolism typically meets its energy requirement by using the body's stores of glycogen and subsequently fats. It is measured as 3 to < 6 METs. Anaerobic metabolism is required to provide energy during vigorous-intensity physical activities, which increase heart and breathing rates to values greater than 70.0% of their maximum. Researchers measure it at approximately 6 METs (McKinney, Lithwick, Morrison, Nazzari, Isserow, Heilbron & Krahn, 2016).

The resulting reduction in social participation and physical activity (PA) as a result of COVID-19 home confinement was of serious concern for older adults in

all walks of life, as they were typically less active when compared to younger aged individuals and more prone to chronic diseases (Roschel, Artioli & Gualano, 2020). Ritchie (2019) asserts that an increase in non-communicable diseases (NCDs) like cardiovascular disease, diabetes, and cancer closely correlates with an increase in obesity, given that obesity is a significant risk factor for most NCDs. According to recent reports, obesity poses a significant risk for morbidity and mortality from COVID-19, and the lockdown has led to an increased incidence of obesity due to inactivity (Abbas, 2020).

According to Florencio, Moreira, Silva, and Almeida (2016), obesity is a chronic metabolic disease characterized by abnormal or excessive accumulation of body fat, which forms the adipose tissue and directly contributes to the onset of other chronic diseases. The World Health Organization (WHO, 2018c) estimates that 1.9 billion adults worldwide, or approximately 40% of the adult population, are overweight, with 650 million (13%) classified as obese. WHO (2011) affirmed that different anthropometric measurements can predict cardiovascular disease risk, such as hypertension, with Body Mass Index (BMI), waist circumference (WC), waist-to-hip ratio (WHR), and waist-to-height ratio (WHtR) being the commonly used anthropometric screening tools.

Heyward (2006) described anthropometry as the measurement of body size and proportions. The measurements include body height, weight, circumference, skinfold thicknesses, and bony widths and lengths. Anthropometric characteristics, particularly the body composition variables, play a crucial role in assessing health status. Even a slight deviation in these parameters can predict or trigger silent killer diseases like hypertension, diabetes, stroke, and obesity (Ajayi, Sowemimo, Akpan & Ossai, 2019). Studies have reported an increased risk for hypertension, diabetes, cancer, and other diseases in individuals with heavy weight. Use of anthropometry markers is essential for obtaining relevant information that aids in the description of an individual's health status (Dominic, Etchie, Seidina, Niyi-Odumosu & Owolabi, 2018).

Reicherte, Menezes, Hallal, Ekelund, and Wells (2012) opined that there is a strong relationship between physical activity and body composition. Studies have reported that regular physical activity or exercise improves body weight control and body composition, thereby reducing the prevalence of chronic diseases. The body composition of individuals who are physically active is better and has fewer health problems. Consequently, among elderly people, a greater proportion of the physical activity occurs within the context of sport (Ratzla et al., 2010). Therefore, we expect individuals who regularly participate in PA to have improved health and body composition, particularly among institutional athletes across all levels.

Statement of the Problem

Adeyemi College of Education, Ondo, has various sporting facilities and equipment on the ground for both students and staff to make use of. It has, however, been observed to be underutilized by most staff members, with few staff members actively engaging in the usage of such sporting facilities. Following the outbreak of the COVID-19 pandemic, social and physical distancing measures, such as lockdowns of schools, among others, of which sporting activity is a significant inclusion, to curtail the spread of this virus also ended up being disrupted.

During this period, the researcher observed that people who were earlier active have been forced to engage in a less physically active lifestyle, have longer screen time, and have irregular sleep

patterns, resulting in weight gain and corresponding loss of physical fitness, thereby causing them not to meet the weekly recommendations for physical activity and health stated by the World Health Organization's (2010) recommendation of indulging in 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity.

Over time, some staff members of the college have resumed a physically active lifestyle due to their return to sporting activities, but the turnout is still on the low side. Also, there has not been any quantifiable data on the physical activity level of staff members in recent times. Hence, this paper sought to assess the physical activity level and its resultant influence on the health status of Adeyemi College of Education staff members.

Objectives of the Study

The objectives of the study were to:

i. examine the differences between the physical activity levels among staff athletes and non-athletes of Adeyemi College of Education, Ondo; and
ii. examine the differences between the health status markers among staff athletes and non-athletes of Adeyemi College of Education, Ondo.

Research Questions

The following research questions were raised:

1. Will there be any difference between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo?
2. Will there be any difference between the health status markers of staff athletes and non-athletes in Adeyemi College of Education, Ondo?

Research Hypotheses

H_{o1}: There is no significant difference between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo.

H_{o2}: There is no significant difference between health status markers (BMI, WC, WHR, WHtR) of staff athletes and non-athletes in Adeyemi College of Education, Ondo.

Methodology

Ex-post facto research design was used for this study. This research design was adopted because the possession of the pre-existing values to be measured in the players interests the researcher, and as such, no manipulation would be effected on the existing values. The population of the study comprised 1,112 staff members in Adeyemi College of Education, Ondo.

A sample of 133 participants was selected for the study. Stratified sampling technique was used to categorise staff members into athlete and non-athlete categories. Purposive sampling technique was used to select 30 athletes who were regular at training schedules out of 79 registered staff athletes, and random sampling technique was used to select 103 non-athletes out of 1,033 staff non-athletes. The physical activity questionnaire used for this study was adapted from the International Physical Activity Questionnaire (IPAQ) to assess the physical activity level of the respondents. Test re-test method of reliability was used, and results were analysed using Pearson product moment correlation (PPMC). A reliability coefficient of 0.73 was obtained, which suggested high internal consistency.

The standardised instruments used for data collection were calibrated before use. These included a body weight scale calibrated in kilogrammes (*kg*) for measuring body weight, a height scale calibrated in metres for body height and non-elastic tape rule calibrated in centimetres for measuring waist circumference and hip circumference.

Data collection procedure required the participants to wear light clothes, be bare footed and stand in anatomical position during the measurements of height and weight. Data obtained from measurements of body weight and height were used to calculate BMI using the formulae: BMI = .

Waist Circumference (WC) was measured to the nearest 0.1cm using non-flexible tape rule at the narrowest point between the bottom rib and the iliac crest in the mid-axillary plane and hip circumference was measured to the nearest 0.1cm around the widest portion of the buttock above the gluteal fold using non-flexible tape rule. The tape was snug around the body parallel to the floor at the level at which the measurement was taken for both the waist and the hip. Waist-to-hip ratio (WHR) was calculated as the waist circumference divided by the hip circumference, and Waist-to-height ratio (WHtR) was calculated as the waist circumference divided by the height. The standard cut-off point of 0.5 was used for the evaluation of WHtR, which denotes keeping the WC less than half of the height.

Descriptive statistics of mean and standard deviation were employed, and data were analysed using Independent sample t-test for testing the hypotheses at 0.05 alpha levels. The Statistical Package for Social Sciences (SPSS) version 25.0 was used for the analyses. Ex-post facto research design was used for this study. This research design was adopted because the possession of the pre-existing values to be measured in the players interests the researcher, and as such, no manipulation would be effected on the existing values. The population of the study comprised 1,112 staff members in Adeyemi College of Education, Ondo.

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Hypotheses Testing

Ho_1: There is no significant difference between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo?

Table 1: Independent Sample T-test analysis showing the differences between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo.

Category	Mean ± SD(*MET-min/week)*	Mean Difference	Standard Error Diff	df	t	Sig	Decision
Athlete	2945.52 ± 523.54	2169.72	130.45	131	14.73	0.03	H_0 Rejected
Non-Athlete	775.80 ± 267.04						

p < .05

Table 9 shows the t-test analysis of difference between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo. From the table, t(131) = 14.73, p(0.03) < .05. This implies that there is a significant difference between the physical activity level of staff athletes (2945.52 ± 523.54 *MET-min/week*) and non-athletes (774.80 ± 267.04 *MET-min/week*). Hence, the null hypothesis which was stated thus; "there is no significant difference between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo", was rejected

Ho_2: There is no significant difference between health status markers (BMI, WC, WHR, WHtR) of staff athletes and non-athletes in Adeyemi College of Education, Ondo?

Table 2: Independent Sample T-test analysis showing the differences in health status markers between staff athletes and non-athletes in Adeyemi College of Education, Ondo

Variable	Category	Mean ± SD	Mean Diff	Standard Error Diff	df	t	Sig	Decision
BMI *(kg/m²)*	Athlete	24.12 ± 1.41	-4.45	0.58	131	-6.45	0.03	H_0 Rejected
	Non-Athlete	28.57 ± 2.82						
WC *(cm)*	Athlete	80.82 ± 5.68	-.9.93	1.89	131	-7.21	0.40	H_0 Not Rejected
	Non-Athlete	90.75 ± 7.34						
WHR *(cm)*	Athlete	0.90 ± 0.03	-0.06	0.01	131	-5.15	0.03	H_0 Rejected
	Non-Athlete	0.96 ± 0.05						
WHtR *(cm)*	Athlete	0.49 ± 0.04	-0.08	0.01	131	-6.48	0.04	H_0 Rejected
	Non-Athlete	0.57 ± 0.06						

p < .05

Table 2 shows the t-test analysis of difference between the health status markers (BMI, WC, WHR, WHtR) of staff athletes and non-athletes in Adeyemi College of Education, Ondo. From the table, differences in BMI indicates t(131) = -6.45, p(0.03) < .05. This implies that there is a significant difference between the BMI of athletes (24.12 ± 1.41 kg/m^2) and non-athletes (28.57 ± 2.82 kg/m^2). Hence, the null hypothesis which was stated thus; "there is no significant difference between the health status marker (BMI) of staff athletes and non-athletes in Adeyemi College of Education, Ondo", was rejected.

From Table 2, differences in WC indicates t(131) = -7.21, p(0.40) > .05. This implies that there is no significant difference between the WC of athletes (80.82 ± 5.68 *cm*) and non-athletes (90.75 ± 7.34 *cm*). Hence, the null hypothesis which was stated thus; "there is no significant difference between the health status marker (WC) of staff athletes and non-athletes in Adeyemi College of Education, Ondo", was rejected.

Differences in WHR indicates t(131) = -5.15, p(0.03) < .05. This implies that there is a significant difference between the WHR of athletes (0.90 ± 0.03 *cm*) and non-athletes (0.96 ± 0.05 *cm*). Hence, the null hypothesis which was stated thus; "there is no significant difference between the health status marker (WHR) of staff athletes and non-athletes in Adeyemi College of Education, Ondo", was rejected (Table 2).

Differences in WHtR indicates t(131) = -6.48, p(0.04) < .05. This implies that there is a significant difference between the WHtR of athletes (0.49 ± 0.04 *cm*) and non-athletes (0.57 ± 0.06 *cm*). Hence, the null hypothesis which was stated thus; "there is no significant difference between the health status marker (WHtR) of staff athletes and non-athletes in Adeyemi College of Education, Ondo", was rejected (Table 2).

Discussion of Findings

The objectives of this study were to determine the physical activity level, examine the body composition indicators of health status as well as to examine the differences between the physical activity levels and health status markers among staff athletes and non-athletes of Adeyemi College of Education, Ondo. Generally, the findings of this study suggest that level of physical activity has an inverse relationship with the body composition indicators of health status. This tallied with findings stated by Dominic, Onifade and Lajide (2010) that, there is an inverse relationship between the physical activity level of individuals and their body weight, size and fat level.

Hypothesis one which states that "there is no significant difference between the physical activity level of staff athletes and non-athletes in Adeyemi College of Education, Ondo" was rejected (*p-value < 0.05*). Active participation in physical activity within the recommended range of values stated by WHO (2010) as noticed among the staff athletes, have been reported by Katzmarzyk and Lear (2012) to reduce obesity and risk of chronic disease in obese individuals, with a decreased risk of metabolic syndrome from 30-40% in general populations.

Hypothesis two, which states that "there is no significant difference between health status markers of staff athletes and non-athletes in Adeyemi College of Education, Ondo" was rejected on (BMI, WHR, WHtR) levels (*p-value < 0.05*) and not rejected on (WC) level (*p-value > 0.05*). Majority of the staff athletes were found to be within the healthy range of values serving as indicators of health. This buttresses Talabi's (2016) notion of physical activity being the cheapest, easiest and most reliable means towards achieving optimum health and wellness. The risky body composition indicators of health status possessed by the non-athletes has been stated to be a predisposing factor leading to arthritis, hypertension, type II diabetes and premature mortality from all causes (Dominic, Ibraheem, Seidina & Niyi-Odumosu, 2017)

Results on WC and WHtR further corroborated the statement of Ashwell & Gibson, (2016) about WHtR being a simple primary risk assessment tool that could be used to further identify more subjects at cardio-metabolic risk than the combination of BMI and WC.

Conclusion

Based on the findings of this study, the conclusion below was drawn:

1. Staff athletes engaged actively in physical activity within the recommended range of values stated by WHO (2010).
2. Majority of the staff non-athletes possessed risky health status.

Recommendations

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

1. A workplace culture and environment that supports and motivates employees to be physically active should be developed.
2. Workshop and seminars should be organised in order to raise awareness of individuals regarding the benefits of physical activity.
3. Periodic assessment of health status should be further encouraged.
4. Regular engagement in physical activity at moderate to vigorous intensity should be encouraged to promote health and fitness.

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