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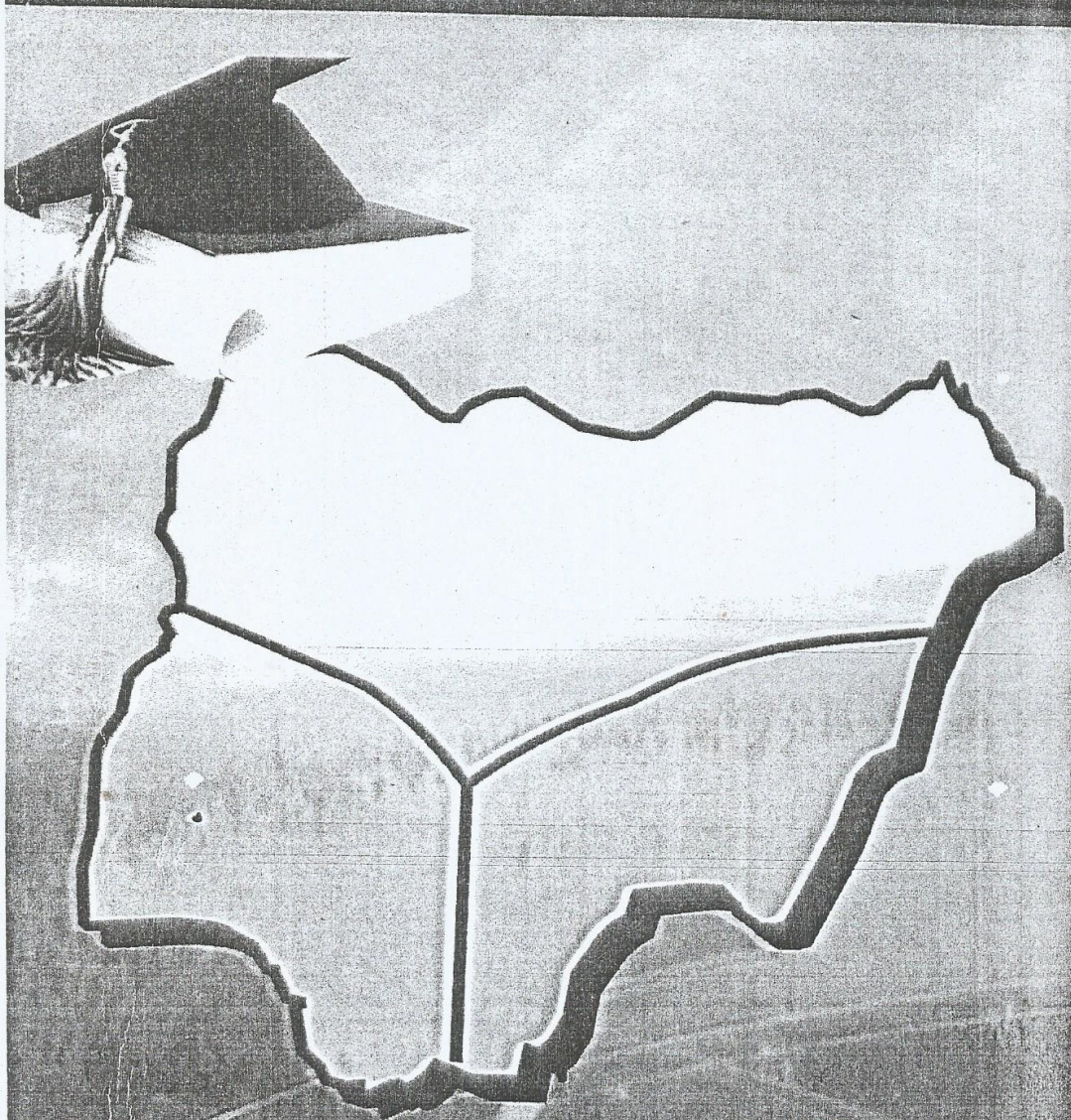

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EFFECT OF PHYSICAL INACTIVITY ON PERCENT BODY FAT OF COLLEGE MEN AND WOMEN

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ABSTRACT

The purpose of the study was to determine the effects of physical inactivity on percent body fat of college men and women. The participants were male and female students of College of Education, Ikere-Ekiti. The participants for the study consisted of twenty one men and twenty three women aged between eighteen and thirty years who were randomly selected, participated in the study. Hypothesis was formulated and tested to determine the effect of physical inactivity on percent body fat. Descriptive statistics of mean, standard deviation and range was used to describe the data. Inferential statistics of independent "t" test was used to compare both groups to see if any significant difference exists between them. The result obtained showed that there was significant difference in percent body fat between participants after the study. Body fat increases in the participants after 12 weeks of physical inactivity. It is recommended that the college men and women should take part in moderate intensity physical activities two to three days per week.

INTRODUCTION

Physical inactivity is associated with the development of hypokinetic diseases, such as hypertension, angina Pectoris, obesity, stroke, diabetes mellitus, hardening of the arteries and heart attack. Habitual inactivity results in gasping for breath and tiredness at the slightest physical exertion. A person in this situation has no reserve energy and cannot therefore cope with emergency situation. Inactivity has also been linked with low level of flexibility, lower back pain, and susceptibility to strains and arthritis. Physical inactivity promotes human deterioration.

American Medical Association (AMA, 1990) in its Guides to the Evaluation of Permanent Impairment, identified sedentary lifestyle/physical inactivity as a positive risk factor for coronary artery disease. It classified sedentary lifestyle/physical inactivity as persons 25% of the population, as defined by the combination of sedentary jobs involving sitting for a large part of the day and no regular exercise or active pursuits.

Hoeger and Hoeger (2007) enumerates the causes of physical inactivity as the decrease in the required daily energy (caloric) expenditure as a result of modern-day conveniences, such as short automobile trips that replace walking or riding a bike decrease energy expenditure by 50 to 300 calories per day; automatic car window and door openers represent about 1 calorie at each use; automatic garage door openers, 5 calories; elevators and escalators, 3 to 10 calories per trip; food processors, 5 to 10 calories; riding lawnmowers, about 100 calories; automatic car washes, 100 calories; hours of computer use to e-mail, surf the 'net, and conduct internet transactions represent another 50 to 300 calories; excessive television viewing can add up to 200 or more calories, all these lull us into physical inactivity.

Body composition changes take place slowly in human exercise studies, and the magnitude of the changes is small (Scott, 2007). Wilmore's Summary (1983) of exercise and body composition studies showed the average decrease in percent body fat to be only 1.6% with fitness programs ranging in duration from 6 to 104 weeks. The human body is composed of fat and non-fat components. The fat components are usually call fat mass or percent body fat. The non-fat component is termed lean body mass. Total fat in the human body is classified into two types, essential fat and storage fat, for normal physiological function, essential fat is needed, without it human health deteriorates.

The body fat percentage is the percentage of the body that is made up of both essential and stored fats. This number is a great indicator of the condition of the body. If there is too much fat, regardless of how much the body weigh, is a very dangerous thing and efforts should be made to get the body fat percentage in the right zones. Essential fat is necessary for the body to function and to maintain life and reproductive functions. The percentage is 3-5% in men and 8-12% in women, as a result of the importance of essential fat, women's body fat percentage should not be lower than 12%, and men's should not be lower than 3% of essential fat.

Stored fat, stored in adipose tissue, protects internal organs in the chest and abdomen. It is the excess fat that the body does not need to function. Stored fat is used when the body exerts more energy than normal, such as exercising. When not burned off, stored fat accumulates over time and leads to being overweight and obesity. When body fat percentage is calculated, it is the stored fat that indicates how healthy or unhealthy a person is in regards to fat content. For a healthy woman, the body fat percentage is 14% to 25%. It means that the woman has 12% essential fat, and another 2% to 13% of stored fat in the body. If this percentage increases to over 32%, the person is considered to have too much stored fat and is considered overweight. For men essential fat constitutes about 3 percent of the total weight, if the percentage increases to 25%, the person is considered over weight. (Hoeger & Hoeger, 2007).

Many adult men and women in Nigeria today are faced with chronic ailments. Many are assisted before they can walk, some walk with crutches, some are placed on special diets due to these diseases.

Inactivity has been identified as a primary risk factor for the development of chronic heart diseases (CHD) American Heart Association (AHA, 2005). Due to inactivity (Pollock & Kevin, 1994) submitted that there is increasing risk of chronic diseases (e.g. coronary heart disease (CHD), stroke, osteoporosis, diabetes, obesity/ hypertension which have become the leading causes of morbidity and mortality.

Blair and Brodney (1999) submitted that inactivity and low cardiorespiratory fitness are as important as overweight and obesity as mortality predictors. They found out that inactivity cause cardiovascular disease, mortality, coronary heart disease (CHD), hypertension, type 2 diabetes mellitus, and cancer. This was corroborated by (Guerra, 2006), who opined that increasing evidence suggests that low levels of physical activity in children and adolescents are related to increased levels of cardiovascular risk.

Ogden (2006) submitted that the prevalence of overweight children/adolescence increased from 13.8 to 16.0% for males and 14.0 to 18.2% for females. Nigeria not exclusive of the three major causes of death (tobacco, poor diet, and physical inactivity) as classified by the centre for Disease control (Mokdad, 2000), physical inactivity has received the least attention. Layel, Thyfault, Stump and Booth (2007) described the recovery of adiposity from a low proportion of fat to body mass in humans as "adiposity rebound". Adiposity rebound has been noted in children and it increases the risk of future obesity (Dietz, 2004; Rolland, 2006), glucose intolerance (Bhargava, 2004), and diabetes (Erickson, 2003). The activity to inactivity transition and the resulting increase in fat might be analogous to adiposity rebound. Indeed, adiposity rebound has been attributed to periods of physical inactivity in humans (Taylor, 2005). Physical activity has been observed to flow the growth of abdominal adipose tissue, and the ensuing period of physical inactively permitted fat cell hyperplasia in humans (Layel, 2007). It is conceivable that inactivity early in life may program "thrifty" genes that will exert adverse metabolic consequences later in life. William (2011) submitted that insulin resistance can be exacerbated by inactivity, loss of lean tissue and overweight. In order to control the amount of insulin secreted by the body, proper diet and exercise must become a regular part of day-to-day activities.

Percent body fat is one of the determinants of physical fitness. Percent body fat of < 12 in males < 17 in females is considered lean, between 12-21 in males, 17-28 in females is considered acceptable, 21-26 in males, 28-33 in females is considered moderately overweight and > 26 in males and > 33 in females is considered

overweight. For men below 3% is considered a health risk and for women less than 7% has negative health implication (Neil, 1998).

Little research has been carried out on effects of physical inactivity on percent body fat of college men and women in Nigeria. Therefore this paper examines the effects of physical inactivity on college men and women in college of education Ikere-Ekiti, Nigeria.

HYPOTHESIS

There would be no significant difference in pre and post percentage body fat (% body fat) of college men and women after twelve weeks of physical inactivity.

METHODOLOGY

The participants of this study consisted of 43 apparently healthy men and women of the school of science, college of education, Ikere-Ekiti. Their ages ranged from 18-27 years. The participants were randomly selected for the study with fish bowl method with replacement, so that all participants can be given equal opportunity to be chosen.

The age, status, weight and skinfold measure of each participant were taken to serve as the pretest measurements. The skinfold of the participants were measured using the large skinfold caliper (Cambridge scientific industries, U.S.A) at the following sites triceps, abdominal, front thigh, medial calf, subscapular and supraspinale following the procedure described by Katch (1991), Amusa and Igbanugo (1985) and Lohman, Roche and Martorell (1991). Siri formula (495/BD-450) was used to compute the body density for the participants. The computed densities were fed into the aquation derived by Withers, Whittingham, Norton and Dutton (1987) for male and female. Male body density equation = 1.10326 0.00031 (Age) 0.00036 (triceps + subscapular + supraspinale + abdominal + front thigh + medial calf). Female body density equation = 1.07878 0.00035 (triceps + subscapular + supraspinale + abdominal + front thigh + medial calf) + 0.00032 (Age) to derive percent body fat for the participants. The participants carried out their normal daily tasks for 12 weeks and they were asked to keep strickly to their pretest diet.

POST EXPERIMENTAL MEASURES

After twelve weeks of inactivity menace in physical activities by the participants, the weight and skinfold measure of each participant were taken as was done during the pretest measures. Analysis of data was carried out using descriptive statistics of mean, range, and standard deviation to describe the data. Inferential

statistics of students t-test was used to test for differences in pre and posttest measures of the percent body fat. Level of significance was set at 0.05 alpha.

RESULTS

Table 1 shows the pre-test mean and standard deviation of percent body fat of participants. The independent t-test was used to compare these parameters between the participants. The result shows that there was a significant difference between men and women .participants, t = -14.167 (tc = 2.021, df = 41 P < 0.05). A comparison of the post-test scores for percent body fat of the participants (table 2) also shows a significance difference between the participants, t = -13.584 (tc = 2.021, df = 41 P < 0.05).

Percent body fat after 12 weeks of physical inactivity

Table 1: Pre-test percent body fat (% body fat) between men and women.

Variable	Gender	N	X	SD	df	t_{ob}	t_c	Remark
Percent body fat	**Men**	**21**	**6.51**	**1.13**	**41**	**-14.167**	**2.021**	S
	Women	**22**	**16.71**	**3.11**				

Significant level = 0.05 alpha.

Post-test percent body fat (% body fat) between men and women.

Variable	Gender	N	X	SD	df	t_{ob}	t_c	Remark
Percent body fat	**Men**	**21**	**7.15**	**1.21**	**41**	**-13.584**	**2.021**	S
	Women	**22**	**17.91**	**3.43**				

Significant level = 0.05 alpha.

DISCUSSION

The anthropometric assessments are presented in tables 1 and 2. The participants body fat increased from 6.51 to 7.15 for men and 16.71 to 17.91 for women, the results were significant. The result of men and women participants is in line with literature as observed by (Pollock & Kevin, 1994; Blair & Brodney, 1999; AHA, 2005) and corroborated by (Guerra, 2006) that low levels of physical activity in children and adolescents are related to increased levels of cardiovascular risk. Increased in body fat has been attributed to inactivity as observed by (Ericksion, 2003; Dietz, 2004; Taylor, 2005; Rolland, 2006). The significant difference in this study was due to physical inactivity on the part of men and women participants. The increase in percentage body fat of women participants is in line with literature in that women have greater fat percentage than their men counterparts. Essential fat which constitutes about 3 percent of the total body weight in men and 12

percent in women. The percentage is higher in women because it includes sex-specific fat, as can be found in the breast tissue, the uterus and other sex-related fat deposits (Hoeger & Hoeger, 2007). The Increase would be facilitated by physical inactivity beyond the normal value apart from being natural.

CONCLUSION AND RECOMMENDATIONS

The findings of this study showed that physical inactivity significantly increase percent body fat of college men and women. The implication is that physical inactivity will lead to higher risk for disease, after a prolong sedentary life of the participants.

It is recommended that college men and women should participate in moderate intensity physical activities two to three days per week, with one set of eight to fifteen repetitions at a moderate exertion level and using eight to ten different exercises so that each major muscle group is recruited. To reduce the risk of chronic disease in adulthood participants should engage in at least thirty minutes of moderate intensity physical activity on most days of the week.

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