EFFECTS OF AEROBIC DANCE ON SELECTED CARDIOVASCULAR DISEASE RISK FACTORS OF OVERWEIGHT/OBESE NIGERIAN ADULTS

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DEPARTMENT OF PHYSICAL AND HEALTH EDUCATION
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ZARIA, NIGERIA

2007

DECLARATION

I hereby declare that the work in the dissertation entitled “Effects of Aerobic Dance on Selected Cardiovascular Disease Risk Factors of Overweight/obese Nigerian Adults” has been written by me in the Department of Physical and Health Education, under the supervision of Professor M.A. Chado and Professor J. A. Gwani. It has not been presented in any previous application for a higher degree. All sources of information cited have been specifically and appropriately acknowledged by means of references.

_____ _____

Ezra A. Gunen Date

CERTIFICATION

This dissertation titled "**EFFECTS OF AEROBIC DANCE ON SELECTED CADIOVASCUALR DISEASE RISK FACTORS OF OVERWEIGHT/OBESE NIGERIAN ADULTS"** by **Ezra Abednego Gunen** meets the regulations governing the award of the degree of Doctor of Philosophy of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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Professor M. A. Chado Chairman, Supervisory Committee	Date
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Professor J. A. Gwani Member, Supervisory Committee	Date
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Dr. A. I. Kabido Head of Department	Date
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Professor S. A. Nkom Dean, Postgraduate School	Date

DEDICATION

To the memories of: late:

Da'a Gunen T. Yiwal, from whom the patience and endurance in life were first learnt

Na'aTukhutsum Gunen, who despite lack of formal education, knew the joy of academic excellence

and

Mama Nadurung Mbot, a motivator, purposeful mother and a source of encouragement

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TITLE OF DISSERTATION: EFFECTS OF AEROBIC DANCE ON SELECTED CARDIOVASCULAR DISEASE RISK FACTOSRS OF OVERWEIGHT/OBESE NIGERIAN ADULTS.

DEGREE FOR WHICH REPORT WAS SUBMITTED: DOCTOR OF PHILOSOPHY (PhD) IN EXERCISE AND SPORTS SCIENCE**.**

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ABSTRACT

This study was carried out to assess the effects of aerobic dance on selected cardiovascular disease risk factors of overweight/obese Nigerian male and female adults. The CVD risk factors included BMI, determined by dividing the weight (kg) by height in meter squared (wt/ht^2), abdominal fat patterns (WHR), determined by dividing the waist circumference (cm) by the hip circumference (cm), resting heart rate (RHR), resting systolic (RSBP) and resting diastolic blood pressure (RDBP) and VO_2 max.. These variables often aggregate to cause a variety of health and fitness problems to the cardiovascular system that include hypertension, non-insulin dependent diabetes mellitus (NIDDM), osteoarthritis and stroke among others. These variables were evaluated using the standard laboratory procedures and clinical techniques respectively. All the variables were assessed three times at baseline, during (immediately after 8 weeks) and finally immediately after 12 weeks of training. A total of forty (40) subjects (male = 20 and female = 20) were selected using the purposive sampling technique on the basis of their BMI. Only those whose BMI was 25.5kg/m2 and above were included as subjects in this study. All the selected subjects attended a group aerobic dance class three times per week, on alternate days for durations of 30 to 70 minutes at intensity levels ranging from 60% to 75% HR max. The collected data were analysed using the descriptive statistics and repeated measures ANOVA. An alpha level of 0.05 was used to accept or reject the hypotheses of this study. The findings of this study revealed significant sex-specific reductions in BMI ($F = 29.81 < 0.05$), RHR ($F = 11.41 < 0.05$), WHR ($F = 51.68 < 0.05$) and significant sex-specific improvement in VO_2 max ($F = 509.30 < 0.05$). However, resting systolic and diastolic blood pressures did not show these sex-specific

modifications. The adopted duration of aerobic dance (12 weeks) and the intensity levels of 60% to 75% HR max used in this study may explain this. The results of this study also revealed significant test by group interactional effects of 12 week aerobic dance on BMI ($F = 54.86 < 0.05$), WHR ($F = 16.12 < 0.05$), RHR ($F= 34.45 < 0.05$), RSBP ($F = 13.59 < 0.05$), and VO_2 max ($F = 300.69 < 0.05$). However, the results failed to show significant difference between male and female adults in the effects of 12 week aerobic dance on all the selected CVD risk factors. Therefore, to minimize the trauma of cardiovascular disease risk of overweight/obesity, adults should be encouraged to engage in regular low to moderate aerobic dance on alternate days for durations of 30 to 70 minutes.

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LIST OF ABBREVIATIONS

ACSM	American College of Sports medicine
AHA	American Heart Association
BP	Blood Pressure
BMI	Body mass index
CT	Computed tomography
CVD	Cardiovascular disease
FA	Fatty acids
FFA	Free fatty acids
HC	Hip circumference
LMPA	Low-moderate physical activity
LTA	Leisure time activity
MPA	Moderate physical activity
MRI	Magnetic resonance imaging
RHR	Resting heart rate
RMR	Resting metabolic rate
USCDC	United States Center for Disease Control
USDHHS	United States Department of Health and Human Services
WC	Waist circumference
WHR	Waist-to-hip ratio
VO_2 max	Maximal oxygen consumption in $ml.kg^{-1}.min^{-1}$

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OPERATIONAL DEFINTION OF TERMS

The following terms have been operationally defined as they are used for the purpose of this research work.

CARDIOVASCULAR DISEASE RISK FACTORS: These are conditions, traits or habits that are associated with increased risk of developing specific health problems in the future to the cardiovascular system. In this study, they are those risk factors that can be changed with aerobic exercise participation and they include high blood pressure (systolic and diastolic), high body mass index, high waist-to-hip ratio and low aerobic capacity

SYSTOLIC BLOOD PRESSURE (SBP): The highest pressure existing in the arteries, resulting from ventricular systole. In this study, resting systolic blood pressure greater than 140mmHg places an individual at risk for cardiovascular health

DIASTOLIC BLOOD PRESSURE: The lowest pressure existing in the arteries during diastole. In this study, resting diastolic blood pressure greater than 90mmHg places an individual at health risk.

AEROBIC DANCE: A fitness training mode mostly choreographed to music that fitness instructors often use for conditioning their clients for health and fitness improvement. In this study, its use incorporated callisthenic type-activities that were rhythmical and continuous in nature, involving large muscle groups that lasted between 30 to 70 minutes for duration of 12 weeks. It was choreographed to music meant to stimulate the interest of the participants during each training session.

BODY MASS INDEX (BMI): It is an individual's weight in kilogram (kg) divided by the height in meters squared (Wt (kg)/Ht (m^2). In this study, BMI greater than 25.5kg/m^2 for men and 26.5kg/m^2 for women respectively was considered overweight while BMI greater than 30kgm^2 for men and 31kg/m^2 for women respectively was considered an obese condition.

WAIST-TO-HIP RATIO: This is one of the most often used clinical applications of girth measurements that reflects the degree of fat concentration at the abdominal region described as android for males and gynoid for females. In this study, WHR of 0.88-0.94 and 0.77-0.82 was the measure of overweight for men and women while >0.94 and >0.82 was a measure of obesity for men and women respectively.

AEROBIC CAPACITY (VO_2 MAX): This is the maximal rate at which an individual can consume oxygen during physical activity. In this study, it was used as the best index of cardio-respiratory fitness