

**PHYSIOLOGICAL CHANGES IN APPARENTLY HEALTHY
MIDDLE AGED FEMALE WORKERS, FOLLOWING AN INDIGENOUS
AEROBIC DANCE PROGRAMME**

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Abstract

People start aerobic dance programme with great zeal and motivation, only to quit after few weeks or find their zeal dying out almost immediately, due to inability to cope with the style of music. Nigeria has rich cultural music and dance for various social and religious functions, which have not been incorporated for aerobic dance exercise to attain physical fitness. This study determined the extent to which Nigerian indigenous music in aerobic dance exercise affects selected physiological parameters of middle-aged female workers. Quasi-experimental Pre-test, post -test control group research design was adopted. Female workers from Lagos State Ministry of Health, Alausa, was purposively selected for the study. (n=47) women who gave their consent, were randomly assigned to the two groups of experimental (n=23) and control group (n=24). Variables tested includes systolic and diastolic blood pressure, triglyceride, cholesterol and blood sugar level. The descriptive statistics of frequency counts, and inferential statistics of analysis of covariance (ANCOVA) were used for statistical analysis. Significant reductions were observed in all variables tested after the dance programme. It was recommended that Nigerian indigenous music be integrated into aerobic dance programme against foreign music in order to promote exercise adherence, higher level of endurance, strength, improved fitness level and productivity among female workers.

Keywords: Aerobic Dance, Female workers, Nigerian Indigenous, Middle-aged, Physiological

Introduction

Physical inactivity, accompanied by industrial development and consequent change in lifestyle, affects personal and public health. It is well known that, sedentary life style leads to major health problems such as, obesity, high blood pressure, and glucose intolerance. These results encouraged many researchers to investigate and find out proper exercise programs that should be prescribed to enhance physiological and psychological health of women. In very recent studies, regular physical activity and exercises such as step and dance aerobics are associated with a reduced cardiovascular mortality rate(Otinwa, 2014). Women health can benefit from aerobic dance exercises in a number of ways. The American College of Sport Medicine (2000) explains that aerobic exercise can improve women's cardiovascular health, decrease blood pressure, improve blood sugar, blood cholesterol and help in weight management. Improvement can also be significant in muscle strength, coordination flexibility and balance. Even though aerobic dance is a form of exercise, as highlighted above, not all Nigerian women are involved.

Several health issues have emerged in the past decades, because of their particular relevance to women, yet some body organs and systems become the object of particular concern, or perhaps unfair scrutiny, as

a woman enters middle age. It is imperative to take a closer look at some of these health issues confronting the women folk in recent time. Women's health has been a source of concern globally and this has led to increasing awareness on the biological complexity of women, like hormones, pregnancy and menopause with researchers and policy makers directing great effort at bringing solution to the health challenges of women (Tinker, Finn & Epp, 2000).

Aerobic dance exercise is engaged by the beat of the song/music carefully selected to match the tempo or pace at which the exercises need to be accomplished both in terms of safety and effectiveness. As with other forms of exercise, aerobic dance performed within a target heart rate of between 60% and 70% of the maximal heart rate (MHR) has demonstrated cardiovascular and metabolic benefits such as increased maximal oxygen consumption (VO₂max) improved aerobic endurance capacity, and increased energy production (Banfi, 2006; Adesina, 2012). It has become imperative for exercise specialists and researchers to further investigate the specific benefits of aerobic dance exercise not with the common use of contemporary or foreign music but with the use of Nigerian indigenous music for aerobic dance.

Music have a considerable effect on enjoyment levels during exercise and selecting the right music is a key factor in maintaining adherence to exercise (Karageorghis, 2008). During repetitive, endurance-type activities like aerobic dance, self-selected, motivational and simulative music is shown to enhance effect, reduce ratings of perceived exertion, and improve energy efficiency leading to increased work output (Terry & Karageorghis, 2011). Before the advent of contemporary music, where musical instruments such as the Piano, Guitar, Saxophone were used, Nigerians used indigenous musical instruments such as the Ogene, Ekwe, Oja, Igba, Udu, Kora (Igbo musical instrument). Agogo, Agidigbo, Bata drum, Gudugudu and Talking Drum (Yoruba musical instruments). Goje, Kukkuma, Kontigi, Kalangu, Kakaki, Shantu, (Hausa musical instruments) and many others to play folk music and to produce rhythm. Several of these instruments were used in the early nineties and they were an integral part of the life of the Nigerian people (Akinsipe, 2003).

The benefits of aerobic dance exercise in the amelioration of modifiable cardiovascular disease (CVD) risk factors such as reduction in blood pressure levels have been widely reported in the literature. The reduction of resting blood pressure after a single bout of exercise in both normal and hypertensive patients together in the reduction of submaximal exercise systolic pressure after exercise training suggest that exercise induced effects of blood pressure regulation may contribute towards a reduction in CVD risk by lowering the blood pressure levels. Thus exercise may serve as a preventive modality in the amelioration of the aged dependent rise in blood pressure as well as exerting its effects through a reduced frequency in arterial hypertension development. Elevated blood pressure is an important risk factor for cardiovascular diseases, for coronary heart disease as well as cerebrovascular disease (Giampaoli, 2001).

Blood glucose level is chiefly controlled by the hormones insulin and glucagon, but other hormones play also a role. A defect in insulin secretion, insulin action, or both results initially in impaired glucose

tolerance (IGT) and causes hyperglycemia. Eventually, most cases of IGT will progress toward overt diabetes mellitus, a condition where the blood glucose level exceeds the reabsorption threshold of the kidneys and glucose is excreted in the urine. Hyperglycemia causes microvascular and macrovascular damage in several organs and is a powerful risk predictor for cardiovascular disease morbidity and mortality (Abel, Peroni & Kim 2001). The evidence for the adverse effects of obesity on women's health is overwhelming and indisputable. Obese women are particularly susceptible to high blood pressure, and diabetes, which in turn, puts women at increased risk of cardiovascular disease (CVD) which is the leading cause of mortality among women (Mayo Clinic 2014). To reduce the risk of cardiovascular disease, efforts have focused on modifying the metabolic risk factors that constitute glucose intolerance through aerobic dance exercise (Bentley-Lewis, Koruda & Seely, 2007).

Although many heart attacks occur in persons with "normal" blood lipid levels. However, clinical trials with the so called "statin" group of drugs have shown that reducing blood lipid levels decreases the risk for coronary events. Lipid transport in the circulation occurs in the form of lipoproteins (protein shells surrounding a lipid core). Lipoproteins are classified according to their source, composition and physiological action. (Pearson, Laurora, Chu & Kafonek, 2002). The two types considered to be most important for cardiovascular risk assessment are low density lipoproteins (LDL) and high density lipoproteins (HDL). They are involved in the transport of cholesterol to and away from the body tissues, which led to the suggestion that the ratio LDL/HDL is an important indicator for cardiovascular risk (European Health Risk Monitoring Project & Tolonen, Wolf, Jakovljevic & Kuulasmaa, 2002).

Awopetu (2017) asserts that physical activity prevents heart related diseases which lead to the incidence of heart failure because aerobic dance exercise training causes biochemical changes which affect nutrient deposits such as increased cholesterol concentration and Low Density Lipoprotein (LDL) in the blood vessels. Training increase concentration of High Density Lipoprotein (HDL) which helps in carrying away vascular disease causing deposits from blood vessels. This can prevent incidence of heart related diseases. Also there is improved fat metabolism particularly at rest since the caloric expenditure is increased as a result of regular participation in physical activity.

Aerobics dance has been referred to as dance movements put to music, but the scope has expanded to include low-impact aerobics, high-impact aerobics, water aerobics, step aerobics, funk aerobics, slide aerobics, and country-western line aerobics. The current interest in aerobic exercise is the result of the wide-spread interest in improving appearance, health, and longevity. Therefore there is need to incorporate Nigerian indigenous music into an aerobic dance exercise such dance that the average Nigerian adult who intends to keep fit may easily relate or identify with. Therefore, this study is an attempt to determine the effects of Nigerian indigenous aerobic dance on blood related variables of apparently healthy female workers

Statement of the Problem

Women's health has been a source of concern globally and this has led to increasing awareness on the biological complexity of women, like hormones, pregnancy and menopause with researchers and policy makers directing great effort at bringing solution to the health challenges of women (Byron, 2010). It has been observed over the years by the researcher that there is a decline in exercise adherence and inability to sustain the initial drive and zeal to exercise. This is probably as a result of inability to relate well with foreign music being played during exercise at the centers. Indigenous Nigerian music such as apala, fuji, juju, atilogu, bata are not popularly in use for aerobic dance workout. This is an aerobic dance mode that will unlock music from Yoruba, Hausa and Igbo as the workout progresses exposing the participants to authentic customs, local rhythms and native dance styles, targeting cardiorespiratory, body composition and musculoskeletal fitness of women.

Purpose of the Study

To determine the effects of Nigerian aerobic dance music on the physiological parameters of middle-aged female workers. To develop and utilize an aerobic dance exercise training programme. To determine the changes in pre-test and post-test measurement of all physiological parameters of middle-aged female workers.

Research Hypothesis

1. There will be no difference in the of Blood pressure, Blood sugar level, Blood cholesterol and Triglyceride of apparently healthy middle aged women following a Nigerian Indigenous aerobic dance program.

Methods and Procedure

The study was a Quasi-experimental, pre-test post-test control group design. Target population for this study comprised all female workers who work in the Lagos state Ministry of Health Alausa. (n=50) women gave their signed consent to participate throughout the period of the study and also met the requirements of inclusion and exclusion criteria. Simple random sampling was used to select (n=25) participants who were assigned to each of the two groups. Purposive sampling was used to select female workers from Lagos state Ministry of Health Alausa. During the period of this study, attrition occurred and a total of (n=47) women completed the study. (n=23) for experimental group, and (n=24) for control group. Female workers were found more appropriate because they belong to an organized sector that is more accessible and lead more of a sedentary lifestyle. The participants for the study were domiciled at Folarin Coker Staff Clinic space within the Lagos State Secretariat, Alausa. The Research Assistants which comprise a nurse, lab scientist and two aerobic dance instructors were introduced to the participants of the study, detailed explanation of the study, its benefits and possible implications of participating were also given. Informed consent participation forms were administered to participants to indicate their willingness to take part in the study. Also the researcher posted some articles on fitness, wellness and

health on the Aerobic Dance Whatsapp group chat which was a forum where questions and comments by the participants were attended to. Emphasis was laid on the benefits of exercise and the need to cultivate and maintain the culture of exercise. Pre-test was taken (T₁) on the first(1st) week of the study. Health screening was done to test physiological variables (systolic and diastolic blood pressure, triglyceride, cholesterol and blood sugar level). The values were recorded in the data entry form. The two groups were separated from each other. Duration was 20 – 40 minutes per session, intensity of exercise was low-moderate-high and frequency of exercise was three times per week. Borg's rating scale of perceived exertion (6 -20) which the participants were taught during fitness testing was used to determine intensity of exercise. All participants were asked to maintain their usual diet and family behaviour during the entire period. Treatment group danced to the indigenous Nigerian aerobic dance music (INADM), the Control group was exposed to health talk on fitness, weight management and healthy nutrition. The exercise programme was taught and led by certified aerobic dance instructors. Due to the different work schedule of the women, the researcher organized two sessions per day, all two sessions took place between 4pm-6:30pm and this was done to accommodate all participants who were in the treatment group. The study was concluded with post-test administration of the instruments (T₂) on tenth (10th) week of the study. Medical screening was done again to test all physiological variables (systolic and diastolic blood pressure, blood sugar, triglyceride and cholesterol) after which the values were recorded in the data entry form. Eight (8) weeks was used for the treatment and two (2) weeks for pre and post data collection. The entire study was for ten (10) weeks. The descriptive statistics of frequency counts, percentage, and inferential statistics of analysis of covariance (ANCOVA) was used for analysis. The research hypothesis was tested at 0.05 alpha level.

RESULTS

Hypothesis: There will be no difference in the values of Blood pressure, Blood sugar level, Blood cholesterol and Triglyceride of apparently healthy middle aged women following a Nigerian Indigenous aerobic dance program.

Data Analysis and Result

Table 1: Physical Characteristics and Demographics of Participants (Female Workers)

Age	Frequency	Percentage
30 – 35 Years	8	17.02
36 – 40 Years	11	23.40
41 – 45 Years	10	21.28
46 – 50 Years	14	29.78
51 – 55 Years	4	8.51
Cadre	Frequency	Percentage
Directors	1	2.12
Assistant Directors	16	34.04
Medical Officers	10	21.28
Admin/Human Resource	12	25.53
Others	8	17.02
Marital Status	Frequency	Percentage
Single	12	25.53
Married	28	59.57
Widowed	3	6.38
Separated	4	8.51
Academic Qualification	Frequency	Percentage
WASC/SSCE/OND/NCE	5	10.63
BA, B.Sc, B.Ed, HND	31	65.95
Ma, M.Sc, M.Ed, MBBS	11	23.40

Table 1 shows that majority of women (29.78%) are between the ages of 46-50 years. The table also shows that 2.12% of the participants are at the cadre of Directors, 34.04% are Assistant directors, 21.28% medical officers, 25.53%, Admin/human resource and 17.02% are in other cadres, meaning,

most of the women are in other departments. 25.53% participants are single, 59.57% are married, 6.38% are widowed and 8.51% are separated it shows that most women are married. In terms of the participants' level of education, it is observed that 10.63% of the participant have secondary school level of education while 65.95% of them have equivalent of first degree and 23.40% have equivalent of M.Sc. level of education. This implies that the level of education of the women have B.Sc. and its equivalent.

Table 2: Descriptive analysis of Pre-test and Post-test Mean values for Systolic and Diastolic Blood Pressure, Triglyceride, Cholesterol Blood sugar level of Treatment and Control groups.

Variables	Groups	N	Pre-test	Post-test
Systolic Blood Pressure	Indigenous Aerobic Dance	23	123.52±18.44	122.26±16.02
	Control	24	126.92±16.38	128.04±16.27
Diastolic Blood Pressure	Indigenous Aerobic Dance	23	78.35±15.83	75.48±13.76
	Control	24	82.88±12.61	82.92±12.54
Triglyceride	Indigenous Aerobic Dance	23	250.65±64.18	224.65±54.49
	Control	24	212.67±83.85	213.58±83.73
Cholesterol	Indigenous Aerobic Dance	23	277.04±75.28	257.26±67.39
	Control	24	277.25±45.89	278.88±46.16
Blood Sugar	Indigenous Aerobic Dance	23	86.70±12.21	82.39±14.97
	Control	24	94.25±10.88	94.29±10.86

Descriptive analysis result of pre-test and post-test mean values shows that there was decrease in the resting values of systolic and diastolic blood pressure, blood sugar level, triglyceride and cholesterol in the participants who exercised with indigenous Nigerian aerobic dance music. However there was a slight increase in the resting values of the control group. To determine significant difference among the participants in the experimental conditions, the Analysis of covariance statistics was used while the result of the analysis is presented in Table 3.

Table 3: Analysis of covariance (ANCOVA) for Aerobic Dance effect on Systolic and Diastolic blood pressure, Blood Sugar, Triglycerides and Cholesterol of Middle -Aged Women

Variables	F - cal	F-crit	Sig.
Systolic Blood Pressure	6.937	3.15	0.003*
Diastolic Blood Pressure	5.006	3.15	0.010*
Blood Sugar	3.788	3.15	0.000*
Triglyceride	13.292	3.15	0.000*
Cholesterol	21.92	3.15	0.000*

Analysis of covariance (ANCOVA) proved that significant improvement was observed in the systolic blood pressure, diastolic blood pressure, triglyceride, cholesterol and blood sugar level of middle aged female workers. The result shows that exercising with indigenous Nigerian aerobic dance music helps to reduce all physiological parameters than not exercising at all, these deductions implies that F-calculated was significant since it is greater than the critical F-value of 3.15 given 2 and 58 degree of freedom at 0.05 level of significance. These result corroborates with the findings of Otinwa, 2014 which states that regular physical activity and exercises such as step and dance aerobics are associated with a reduced cardiovascular mortality rate. The outcome agrees with Giampaoli, (2001) findings which affirms that the reduction of resting blood pressure after a single bout of exercise in both normal and hypertensive patients together in the reduction of submaximal exercise systolic pressure after exercise training suggest that exercise induced effects of blood pressure regulation may contribute towards a reduction in CVD risk by lowering the blood pressure levels. Also, it showed that **most physically active individuals experience decreases in resting blood pressure and blood viscosity**. Center for Disease Control and Prevention, (2018) corroborated with the outcome of this study by stating that to reduce the risk of cardiovascular disease and other hypokinetic diseases efforts have been focused on modifying the metabolic risk factors that constitute obesity, dyslipidemia, glucose intolerance, and hypertension, by encouraging women to be physically active. Awopetu (2017) asserts that physical activity prevents heart related diseases which lead to the incidence of heart failure because aerobic dance exercise training causes biochemical changes which affect nutrient deposits such as increased cholesterol concentration and Low Density Lipoprotein (LDL) in the blood vessels. American College of Sport Medicine (2000) agreed that aerobic exercise can improve women's cardiovascular health, decrease blood pressure,

improve blood sugar, blood cholesterol and help in weight management.

Conclusion

The primary purpose of the current study was to determine the effects of Nigerian indigenous aerobic dance on physiological parameters in female workers. The researcher observed that 8-week aerobic dance training program led to significant decrease in measurements of systolic and diastolic blood pressure, blood sugar level, triglyceride and cholesterol. Considering the fact that control group did not participate in any of the organized forms of physical activity, it is clear that the slight increase in the values of their physiological parameters could be explained by the inactivity of these participants. The researcher cultivated positive relationships with the participants by creating a conducive environment that is comfortable enough for interactions about issues relating to health and fitness challenges during the programme. The researcher, with the assistance of qualified doctors, attended to such issues appropriately. It was also observed by the researcher that the indigenous music seems new and surprising to participants, although the Music served as a motivation for participants to workout, especially those from the respective geopolitical zones whose culture of music was displayed. Physical activity at moderate to high intensity, 5 to 7 days/week, for at least 30 min/day and for 60 min/day promotes weight loss, low to moderate intensity, 3 days/week, for 30 min/day by people enhances physical fitness and general wellbeing if it is done with appropriate emphasis on nutrition and exercise adherence.

Recommendations

Nigerian indigenous dance could be used as a group exercise format that incorporates aerobic dance components and would be friendly and appropriate to follow for improving physiological parameters. Presently, aerobics instructors use genre (R&B, salsa, South African music jazz, hip hop) during aerobic workout session, but there could be a possibility of using local indigenous music with familiar beats and rhythm.

Recommendation

1. Nigerian indigenous dance could be used as a group exercise format that incorporates aerobic dance components and would be friendly and appropriate to follow for improving cardiorespiratory and body composition and blood lipid profile.
2. Presently, aerobics instructors use genre (R&B, salsa, South African music jazz, hip hop) during aerobic workout session, but there could be a possibility of using local indigenous music with familiar beats and rhythm.

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