Effects of Indigenous Aerobic Dance Music on the Physiological Variables of Female Workers in Lagos Metropolis

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Abstract

Nigeria has a diversified culture with huge cultural resources for entertainment which includes rich songs composed for various social and religious functions. Even though dance movement is involved, traditional music and dance are not structured for physical fitness. This study determined the effects of indigenous aerobic dance music on physiological variables of female civil servants in Lagos, Nigeria. Ethical approval was obtained from the Health Research and Ethics Committee of Lagos State University Teaching Hospital, (LASUTH) and Post Graduate Committee of the Department of Human Kinetics and Health Education. Quasi-experimental pre-test, post-test control group research design was employed in the study. The samples of this study comprised 47 females with age range of 46-55 years. The participants were divided into two groups: (A) 23 females in indigenous aerobic dance music and (B) 24 females in control group. The training programme was performed 3 times a week for eight weeks. Exercise duration was 30-40 minutes per session at an intensity of 60-80% of maximum heart rate. Pre-test and post-test variables of heart rate, systolic and diastolic blood pressure were measured. The data was analyzed using descriptive statistics of frequency counts and percentages while the inferential statistics of analysis of co-variance was used at 0.05 level of significance. The findings revealed that significant reductions were observed in all variables tested after the dance program in the experimental group. It was recommended that indigenous music should be integrated into aerobic dance program against foreign music in order to promote exercise adherence, perseverance and improved fitness level in Nigerian women.

Keywords: Aerobic, Blood Pressure, Dance Exercise, Female Workers, Physiological.

Introduction

Aerobic dance is an exercise that involves the use of large muscle groups with the fun of dancing. It combines fat burning aerobic movements, muscle building exercises and stretching into routines that are performed with the use of music. Aerobic dance is performed by small groups of all ages and is more popular among young and middle aged men and women (Leelarungrayub, Saidee, Pothongsunun, Pratanaphon, Yakai & Bloomer, 2011). Aerobic dance allows for maintenance and connection to everyday life because it gives a feeling of enjoyment and promotes social interaction, physical fitness and a sense of community appreciation of aesthetics. Aerobic dance is a form of physical activity that is more likely to be adopted as part of exercise program for the middle aged than other forms of activities (Justin, Keogh, Philippa, Linda & Dawn). Aerobic dance as a symbol of quest for fitness, hinges on the use of large muscle groups in a continuous rhythmic movement at an intensity and duration sufficient to stress the cardiovascular and respiratory system at 50% to 80% of maximum oxygen consumption. Aerobic dance is also a combination of dance step patterns and other whole body movements including walking, jogging, hopping, skipping, jumping and kicking accompanied with rhythmic beat of popular music that is drawn from various dance forms such as rock, blues, jazz, juju or high life (Awopetu, 2007). Aerobic dance exercise is engaged by the beat of the music carefully selected to match the tempo or pace at which the exercises need to be accomplished both in terms of safety and effectiveness, and 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, improved aerobic endurance capacity, increased energy production, and reduced total body fat (Adesina, 2012; Banfi, 2006 & Otinwa, 2010).

Music has a considerable effect on enjoyment levels during exercise, and selection of 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 reduce ratings of perceived exertion, and improve energy efficiency leading to increased work output (Terry & Karageorghis, 2011). Carefully selected music can promote physiological benefits during high-intensity exercise and increased exercise adherence among exercise participants (Karageorghis, 2008; Terry & Lane, 2011). 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 foreign music but with the use of indigenous music.

In Nigeria, indigenous musical instruments such as Igbo musical instrument (i.e., Ogene, Ekwe, Oja, Igba, Udu, and Kora), Yoruba musical instruments (Agogo, Agidigbo, Bata drum, Gudugudu and Talking drum), Hausa musical instruments (Goje, Kukkuma, Kontigi, Kalangu, Kakaki, Shantu), and many others were used to play folk music and to produce rhythms before the advent of contemporary musical instruments like the Piano, Guitar, Saxophone. Several of these instruments were used in the early nineties and they were an integral part of the life of Nigerians (Akinsipe, 2003).

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 on bringing solution to the health challenges of women (Byron, 2010). Middle-aged women's physical activity levels have remained low, the rates of obesity for these age groups have increased over the past five decades and the evidence for the adverse effects of obesity on women's health is overwhelming and indisputable (Mayo Clinic, 2016). Obese women are particularly susceptible to high blood pressure, and diabetes, which in turn, puts women at a significantly increased risk of cardiovascular disease (CVD) which is the leading cause of mortality among women (Centre for Disease Control and Prevention, 2012). Two-thirds of women who suffer heart attack do not make a full recovery while 500,000 women die yearly from cardiovascular disease (American Heart Association, 2011; Centre for Disease Control, 2012). To reduce the risk of cardiovascular disease, efforts have been focused on modifying the metabolic risk factors that constitute obesity, dyslipidemia, glucose intolerance, and hypertension, by enjoining women to be physically active, eat healthily, avoid smoking and limit the intake of alcohol (Center for Disease Control and Prevention, 2018).

Otinwa (2010) reviewed 16 lifestyle studies in West Africa, 13 studies were on Nigerians and three on Ghanaians. The prevalence of physical inactivity ranged between 25% and 57%, one study reported much higher prevalence of physical inactivity in women compared with men. Diabetes seemed rare at 0.2% in urban Ghana in 1963 and 1.65% in urban Nigeria in 1985 (Otinwa, 2010). For each study in the two countries, obesity was approximately four times higher in women than men. Physical inactivity, accompanied by industrial development and consequent change in lifestyle negatively affect personal and public health, sedentary life style leads to major health problems such as, obesity, high blood pressure, and glucose intolerance. It is recognized that physical activity behavior prevents the development of many chronic diseases including coronary heart disease (Blavo, Ayoade & Oroleye, 2016). In recent studies, regular physical activity and exercises such as step and dance aerobics are associated with a reduced cardiovascular mortality rate (Otinwa, 2014). The American College of Sport Medicine (2015) posits that aerobic exercise can improve women's cardiovascular health by decreasing blood pressure, improving blood sugar level, help in weight management, muscle strength, coordination, flexibility and balance.

Physiological wellbeing of women and exercise is key to health and fitness. Resting heart rate averages 60 to 80 beats/min in healthy adults. In sedentary, middle-aged individuals it may be as high as 100 beats/min. In elite endurance athletes, heart rates as low as 28 to 40 beats/min have been recorded. Exercise helps gain the most benefits and lessen the risks of heart diseases when exercise heart rate is 60 to 80 percent of maximum heart rate (Wilmore & Costill, 2005). A direct method for determining maximum heart rate is to exercise at increasing intensities until a plateau in heart rate is found despite the increasing work rate. Although heart rate increases rapidly with the onset of activity, provided exercise intensity remains constant, heart rate will level off (Wilmore et al, 2005). Hutber and Plitt (2012) assert that to stay off the chronic diseases of ageing and to reap the rewards of efforts put in for fitness, getting into the heart rate training zone is essential. Knowing and staying within the heart rate training zone is an easy way to pace the intensity of a workout session. Hypertension is a silent disease. If left untreated, makes the heart work harder, speeds up hardening of the arteries (atherosclerosis), and increases the risk of heart attack, stroke, and kidney failure (Hutber et al, 2012). Women who are overweight with a history of high blood pressure, are at greater risk. Most physically active individuals experience decreases in resting blood pressure, blood viscosity thickness, metabolism, body fat and blood sugar (Otinwa, 2014).

Over the years there has been a decline in exercise adherence and inability to sustain the initial drive and zeal to exercise (Awopetu & Ighekpe, 2011). This is probably as a result of inability to relate well with foreign music being played during exercise at the centers (Otinwa & Akinyemi, 2017). Observational studies have it that indigenous music such as apala, fuji, juju, atilogu, and 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. Even though aerobic dance is a form of exercise, Nigerian women are not all involved (Akinyemi, 2014). There is need to incorporate Nigerian music into aerobic dance exercise such that the average Nigerian adult who intends to keep fit may be easily related to it and enjoy same. This study therefore hypothesized that there will be no effects of eight weeks Indigenous aerobic dance training program on resting values of heart rate and blood pressure of female workers in Lagos.

Significance of the Study

Indigenous aerobic dance music may be used as an intervention package to improve physiological health of women and exercise adherence. The outcome of the study may be the basis for Federal and State Ministry of Women Affairs to adopt indigenous aerobic dance music training programme for their staff, especially women who intend to keep fit and stay healthy. The adoption of indigenous music in exercise programs may enhance work performance and ultimately lead to higher levels of endurance, strength and productivity of female civil servants at all levels of government, local, state or federal government. The findings of this study have the potential to stimulate more research on the topic in the future as music is very much liked by many individuals in general and women in particular.

Methods

Ethical approval was obtained from Health Research and Ethics Committee of Lagos State University Teaching Hospital, (LASUTH) with Registration number- NHREC04/04/2008 while the Postgraduate Committee of the Department of Human Kinetics and Health Education, assessed and approved the research protocols.

Quasi- experimental, pre-test post-test control group design was adopted in the study. The control group was not exposed to treatment while two groups received treatment for a period of eight (8) weeks.

Participants

The participants comprised all female workers in Lagos state Ministry of Health, Alausa, Lagos, Nigeria. A total of 50 women gave their written consent to participate in the study and also met the requirements for inclusion and exclusion criteria. Simple random sampling was used to select (n=25) female civil servants who were assigned to each of the two groups. During the period of this study, attrition occurred and a total of (n=47) participants completed the study. The participants for the study were domiciled at Folarin Coker Staff Clinic space within the Lagos State Secretariat, Alausa, Lagos, Nigeria (Table 1).

Table 1 *Physical Characteristics and Demographics of Participants*

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

Procedures

Research assistants in the study comprised a nurse, laboratory scientist and two aerobic dance instructors who were introduced to the participants while detailed explanation of the protocols and its benefits and possible implications were provided. Informed consent forms were administered for participants to indicate their willingness to take part in the study. A Whatsapp social media group chat was created as a convenient mode of communication on the benefits of exercise and the need to cultivate and adhere to exercise. Pre-test (T1) was administered in the first week of the study. These include health screening, heart rate, systolic and diastolic blood pressure. The values obtained were recorded in the data entry form. The two groups were separated from each other. Duration of exercise was 30 - 40 minutes per session, intensity of exercise was low-moderate-high and frequency of exercise was three times per week for 8 weeks . Borg's rating scale of perceived exertion (6 -20) which the participants were taught during fitness testing was used to determine the fatigue level of exercise. All participants were asked to maintain their usual diet and family behavior during the entire period. Treatment group danced to the indigenous aerobic dance music (IADM), while the control group was not exposed to any form of dance. The exercise program was taught and led by certified aerobic dance instructors and each group had a maximum of 10-15 participants per session. Due to the different work schedules of the participants, the researchers 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 post-test of physiological variables was done in the tenth week.

Data Analysis

Data was analyzed using descriptive statistics of frequency counts and percentages while the inferential statistics of analysis of covariance (ANCOVA) was used to determine any significant difference in the post-test mean scores of the variables between the treatment and control groups. The research hypothesis was tested at 0.05 alpha level.

Results

Participants' Demographics

The resting values of heart rate of the participants who exercised with indigenous aerobic dance music decreased, but increased slightly for those in the control group. The systolic and diastolic blood pressure of the participants who exercised using the indigenous aerobic dance music decreased however, there was a slight increase in the control group. Figure 1 presents the result in a Bar Chart.

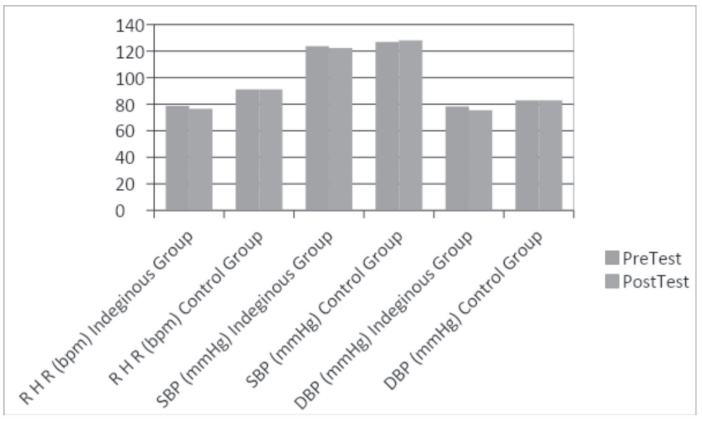

Figure 1. Bar-Chart for Descriptive analysis result of Pre-test and post-test mean values of resting heart rate, systolic and diastolic blood pressure of indigenous aerobic dance group and control group

Key: Resting Heart Rate (RHR), Systolic Blood Pressure (SBP) Diastolic Blood Pressure (DBP)

Effects of indigenous aerobic dance music on resting values of physiological variables of female workers in Lagos.

Table 2 shows that the resting values of heart rate of the participants categorized under indigenous aerobic dance music decreased, but increased slightly for those in the control group. The same pattern was recorded in the systolic and diastolic blood pressure value of the participants.

Table 2: *Descriptive Analysis of Pre-test and Post-test Mean Values for the Resting Values of Participants in Indigenous Aerobic Dance Music Group and Control Groups*

Variables	Group	N	Pre-test	Post-test	Mean Difference
Resting Heart	Indigenous Music	23	78.61 ±12.91	76.61 ±10.32	2.982*
Rate (bpm)	aerobic dance music				
	Control	24	91.17±16.64	91.20 ±16.59	1.467
Systolic Blood	Indigenous Music	23	123.52±18.44	122.26±16.02	-2.588*
Pressure	aerobic dance music				
(mmHg)					
	Control	24	126.92±16.38	128.04±16.27	1.139
Diastolic Blood	Indigenous Music	23	78.35±15.83	75.48±13.76	3.286*
Pressure	aerobic dance music				
(mmHg)					
	Control	24	82.88±12.61	82.92±12.54	1.081

Discussion

The pre-test and post-test mean values of the resting heart rate, systolic and diastolic blood pressure of the treatment group shows that there was decrease in the resting values of heart rate, systolic and diastolic blood pressure. However, there was a slight increase in the resting values of the control group. Analysis of covariance (ANCOVA) revealed significant improvement in the resting heart rate (F3.15 =6.526, p = < 0.05), systolic blood pressure (F3.15 =6.937,p=< 0.05) and diastolic blood pressure (F3.15 =5.006,p = < 0.05). Findings show that indigenous aerobic dance music positively affected the physiological variables tested. Therefore, exercise treatment was effective in reducing resting heart rate, systolic and diastolic blood pressure than not exercising at all. The result corresponds with that of Otinwa (2010) which reported that 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, improved aerobic endurance capacity, increased energy production and reduction in total body fat. This result supports the findings of Otinwa (2014) that regular physical activity and exercise such as walking, jogging, and aerobic dance are associated with a reduced cardiovascular mortality rate. Also, it showed that most physically active individuals experience decreases in resting blood pressure and blood viscosity. To align with the result of this study, Center for Disease Control and Prevention, (2018) affirms 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. Furthermore, in agreement with the findings, the World Health Organization, (WHO 2006) posits that aerobic dance is a fitness activity which uses large muscle groups designed to raise the heart rate while improving cardiovascular endurance, muscular strength and endurance and flexibility. Justin, Keogh, Philippa, Linda and Dawn (2009) justified aerobic dance as a form of physical activity that is more likely to be adopted as part of exercise program for the middle aged than other forms of activities.

The findings of this study agrees with earlier studies reported by Adesina (2012) and Otinwa (2010), that aerobic dance exercise is enjoyed when the beat of the music is carefully selected to match the tempo or pace at which the exercises need to be accomplished both in terms of safety and effectiveness. The slight increase experienced by the control group may be as a result of non-exposure to exercise, considering the fact that the control group did not participate in exercise programme.

Limitations

Considering the duration of the study, recruitment of participants was quite difficult. Also, some of the women who signed up to be part of the study did not meet the requirement for inclusion and exclusion criteria. During the intervention period, attrition occurred hence a total of forty-seven (47) women completed the study. Twenty-three (23) for IADM, and twenty-four (24) for control group.

Conclusion

The primary purpose of the current study was to determine the effects of indigenous aerobic dance on physiological parameters in female workers. The researcher examined an 8-week aerobic dance training program which led to significant decrease in measurements of heart rate, systolic and diastolic blood pressure. The researchers enjoyed positive relationship with the participants by providing an enabling environment that was comfortable enough for interaction during the programme. The researchers, with the assistance of qualified doctors, attended to exercise related issues raised by the participants appropriately. It was also observed that the indigenous music is relatively new, exciting and interesting to the participants. Physical activity at moderate to high intensity, 5 to 7 days/week, for at least 30 minutes/day and for ≥60 minutes/day promotes weight loss while low to moderate intensity aerobic, 3 days/week, for 30 min/ day, enhances physical fitness and general wellbeing if it is done with appropriate emphasis on nutrition and exercise adherence.

Recommendations

Indigenous dance should be used as a group exercise format that incorporates aerobic dance components and would be friendly and appropriate to follow for improving physiological variables. Indigenous aerobic dance music should be introduced to sport and exercise clubs of different categories of clients and participants to enhance their fitness status. Also this study should be replicated with other groups of people, athletes, corporate workers and

students without gender bias.

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