Sierra Leone Journal of Biomedical Research
Vol. 2 (1) pp. 17-22, June, 2010

ISSN 2076-6270
Abstracted on AJOL
http://ajol.info/index.php/sljbr/index

Original Paper

The Effects of a Six-Week Aerobic Dance Programme on Selected Fitness Components and Waist-Hip-Ratio in Adult Males

Okuneye Rafiu O, Adeogun John O* and Idowu Ismail

Physical and Health Education Department, Faculty of Education, Lagos State University, Ojo, Lagos, Nigeria

ABSTRACT

This study examined the effects of a six-week low-impact aerobic dance on selected fitness components (trunk flexibility, leg power and abdominal muscle endurance) and waist-hip-ratio (WHR) in adult males. A total of fifteen (15) Lagos State University male undergraduates (age range: 19-28 years) from the Faculty of Education volunteered to take part in the study. The one-group pre-test - post-text quasi-experimental research design was employed. Both pre-test and post-test measurements were taken from each participant under the same conditions. Participants were all exposed to a low-impact aerobic dance for a duration of six weeks. While the descriptive statistics of mean, range and standard deviation were used to describe the data; inferences were drawn using the Students' paired T-test. Results revealed that a six-week low - impact aerobic dance programme can significantly reduce the waist-hip-ratios, improve trunk flexibility, leg power and abdominal endurance/strength in male undergraduate students.

Keywords: **Hypokinetic diseases, Low-impact aerobic dance, Sedentariness, Waist-hip-ratio**

Received 31 January 2010/ Accepted 21 April 2010

INTRODUCTION

Health is a word often associated with good fitness. Early definition of health focused on illness (Haastrup and Adeogun, 2005). However, as medical and public experts received better training they began to focus on the prevention of illness and diseases as well as on the treatment of people who were already sick (Wilmore and Costil, 1994). This new focus led world health experts to define health as more than absence from disease (Wilmore and Costil, 1994; Hoeger and Hoeger, 1998; Adeogun *et al*., 2003). In recent years, the definition of health has been expanded to include wellness; a state of being that enables you to reach your fullest potential. Wellness thus includes intellectual, social, emotional, physical, and spiritual aspects of one's life (Wilmore and Costil, 1994).

Akdur *et al*. (2007) reported that sedentary lifestyle threatens the health of every individual in every walk of life. Sedentary living costs the United States of America 150 billion dollars each year because of increased need for health care and loss of productivity. Approximately 250,000 people die prematurely because they are inactive. Reports from major health organizations including the office of the Surgeon General; indicate that regular physical activity is one of the best ways of reducing illness and increasing wellness in the society (Akdur *et al*., 2007).

***Corresponding author: Tel: +234 803 3040 786; E-mail: femiadeogun1@yahoo.com**

Evidence indicates that people with a very large waist compared to the hip size tend to have more fat inside the body and may be at risk for health problems (Lindsey, 2007). This is because excessive body fat in the abdominal area is associated with high blood fat level. Studies (Powers and Dodd, 2003; Haastrup and Adeogun, 2005) have shown that individual with "apple shaped" bodies (with more weight around the waist) are at greater health risk than those with "pear shaped" bodies (more weight around the hip area). Waist–hip ratio (WHR) is used as a measurement of obesity which in turn is a possible indication of other more serious health conditions (Wilmore and Costil, 1994). A WHR of 0.7cm for women and 0.9cm for men is known to correlate strongly with general health and fertility. Women within the 0.7cm range have optimal level of estrogen and are less susceptible to major diseases such as diabetes, cardiovascular disorder and ovarian cancer. Men with WHR around 0.9cm similarly have shown to be more healthy and fertile, with less prostate cancer and testicular cancer (Wilmore and Costil, 1994).

Aerobic exercise is any physical exercise that intends to improve the efficiency of the cardiovascular system in absorbing and transporting oxygen. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process. Many exercises are aerobic, and by definition are performed at moderate levels of intensity for extended periods of time (Adeogun and Dansu, 2007; Wikipedia, 2009) Aerobic exercise comprises of innumerable forms; in general, it is performed at a moderate level of intensity over a relatively long period of time. For example, running a long distance at a moderate pace is an aerobic exercise, but sprinting is not, playing singles tennis with continuous motion, is generally considered aerobic activity. While golf or two person team tennis, with brief burst of activity, punctuated by more frequent breaks, may not be predominantly aerobic exercise. Some sports are thus inherently "Aerobic" in nature, while other aerobic dance classes are designed specifically to improve aerobic capacity and fitness. Aerobics dance is a system of exercise designed to help prevent coronary artery diseases and improve total fitness (Haastrup and Adeogun, 2005). Aerobic activity is often classified as either low impact or high impact depending on the intensity, severity and the modality (Wikipedia, 2009).

Most activities in the physical activity pyramid (including lifestyle activities) can be considered aerobic. But only those that are vigorous enough to elevate the heart above the heart rate threshold and into the target zone are considered active aerobics. Aerobic activities are among the most popular and most beneficial of all activities in the physical activity pyramid. Since several studies (Wilmore and Costil, 1994; Shimamoto *et al*., 1998; Haastrup and Adeogun, 2005; Adeogun and Dansu, 2007; Haskell *et al*., 2007) have actually reported the myriad benefits of aerobic activities, this study was therefore specifically designed to examine the effects of a six-week low-impact aerobic dance programme on selected fitness components and waist-hip ratio of adult males.

MATERIALS AND METHODS

Study Population

The population for this study consisted of male students between the ages of 19 - 28 years from Faculty of Education, Lagos State University, Nigeria. The convenient sampling technique was used to select fifteen (15) adult males as participants for the study. Anthropometric rule (tape rule,) to measure the hip and waist girth, recording sheets, stop watch, gym mats, tape recorder (for aerobic dance), and weighing scale were the research instruments used for data collection.

Study Design

The one group pre-test post-test quazi experimental research design was used for the study

$$T_1 \ X \ 1_2$$

Ethical clearance was obtained from the University medical director and all the participants consented to taking part in the study. All participants were invited and gathered at Lagos State University (LASU) indoor sports hall, briefed on what the programme was all about, and then signed the consent form. Then a pre-test was conducted after a five minutes warm up session. Thereafter participants were tested on flexibility, abdominal muscle endurance, explosive leg power, waist-hip-ratios were also determined. All the participants underwent six weeks low-impact aerobic dance three times a week for 30minutes duration. After the six week duration of aerobic exercise, a post-test was conducted on the participants.

The following pre-test and post-test were performed by or administered on the participants:

***Sit And Reach Test*:** This test was used to measure the flexibility level of each participant before and after the programme. Each participant was asked to sit on the gym mat (floor) with legs resting flatly on the side of a box and they stretched their hands as far forward as possible on top of the box and the distance covered by the hands were recorded in inches (Wilmore and Costil, 1994).

***I Minute Sit Up Test*:** This test was used to measure the abdominal muscle endurance level of the participants. Each participant was required to perform sit-ups for one minute. The maximum number of sit-ups that a participant could complete in one- minute was recorded

***Standing Broad Jump*:** This was used to measure the explosive leg-power while jumping forward (horizontally). Participants stood with both feet together behind a marked line on the ground, then jumped furthest away as possible from the marked line. The furthest distance was recorded in centimetres.

Data Analysis

The data collected were subjected to descriptive statistics of mean, standard deviation, range and inferential statistics of paired T-tests.

RESULTS

Table 1: Mean (X), Standard Deviation (S.D) and Range (R) of Participants' Waist Hip Ratio (cm)

	Pre-test	Post-test
X	0.9	0.89
S.D	2.18	1.55
R	70-105	70-90

The result in table 1 shows that the mean value for the pre-test WHR was 0.9 ± 2.18cm with a range of 70- 105cm while the post-test mean WHR was 0.89 ±1.55cm with a range of 70-90cm.

Table 2: Mean (X), Standard Deviation (S.D) and Range (R) for Sit and Reach

	Pre-test	Post -test
X	18.8	24.2
S.D	4.33	5.1
R	10-30	13-34

The result presented in table 2 shows that the pre-test mean for flexibility (sit and reach) was 18.8 ± 4.33cm with a range of 10-30cm, while the post-test mean for flexibility (sit and reach) was 24.2 ± 5.1cm with a range of 13 -34cm. Table 3 presents the pre-test Mean for Abdominal Muscular Endurance which was 31.5 ± 4.3 (min) with a range of 25-40 (min), while the post-test Mean for Muscular Endurance was 36.2 ± 4.24 (min) with a range of 30-45 (min).

Table 3: Mean (X) Standard Deviation (S.D) and Range (R) for Sit-ups (mins)

	Pre -test	Post- test
X	31.5	36.2
S.D	4.3	4.24
R	25-40	30-45

Table 4: Mean(X), Standard Deviation (S.D) and Range (R) for Leg Power (Broad Jump, cm)

	Pre test	Post Test
X	193.6	207.6
S.D	44.6	41.3
R	90-250	100-250

The result presented in table 4 shows that the pre-test Mean for leg power was 193.6 ± 44.6 cm with a range of 90-250 cm, while the post-test Mean for leg power was 207.6 ± 41.3 cm with a range of 100-250 cm. Table 5 shows that the calculated t value of 2.5 and 11.33 was higher than the critical, t value of 1.833 for both waist-hip-ratio and trunk flexibility respectively. This demonstrated that the six-week low-impact aerobic dance programme had a significant effect on both trunk flexibility and waist-hip-ratio of the participants. The table further shows that the calculated t value of 15.7 for abdominal muscle endurance was higher than the table value of 1.833 while the table value of 1.833 was lower than the calculated t value of 5.40 obtained for leg power. This implies significant difference in both abdominal muscle endurance and leg power of the participants due to six weeks low-impact aerobic dance programme.

Table 5: T-test on WHR (cm), Flexibility (cm), Abdominal Endurance (mins) and Leg Power (cm)

Component	Calculated Value	Table Value	Significant Level
WHR	2.5	**1.833**	**P value=0.05**
Trunk Flexibility	11.3		
Abdominal Muscle Endurance	15.7		
Leg Power	5.40		

DISCUSSION

The finding of this study showed that six weeks of low-impact aerobic dance had significant effects on selected fitness components (trunk flexibility, leg power and abdominal endurance) and waist hip ratio (WHR) in adult males. The aerobic dance significantly (p-value of 1.833 at 0.05 level of significance) reduced the waist-hip-ratio, improved trunk flexibility, leg power and abdominal endurance/strength. Similarly in a study conducted by Hopkins *et al*. (1990), significant improvement in all functional fitness components of their participants including cardio-respiratory endurance, strength/endurance, body agility, flexibility, body fat and balance was reported. This was also corroborated by Petrofsky *et al*. (2008) who in a study on the effect of aerobic dance and diet programme on cardiovascular fitness, body composition, and weight loss in women reported a significant decrease in body weight, reduced waist girth and an improved cardiovascular function and general fitness.

Additionally, Akdur *et al*. (2007) reported improved flexibility and significant change in waist-hip-ratio while studying the effects of walking and step aerobics on physical fitness parameters in obese women. Hui *et al*. (2009) also observed significant improvement in both physical and psychological well-being of the participants exposed to dance over time. In a related study, Mazzeo (2002) opine that active aerobic sport and active recreation are good for developing muscular endurance. Similarly, Short and Short (2007) maintained that aerobic dance had effect on leg power of adult males. However, the small our sample size in could be a limitation to this study and might have influenced the results of the study and the observations made.

CONCLUSION

The findings of the study show that a six week aerobic dance programme can have a significant effect on selected fitness component and waists hip ratio (WHR) in adult males.

Significant (1.833 at 0.05 level of significance) post- test have shown increases in flexibility, muscular endurance and improve leg power. Based on the findings, the following recommendations are made:

1. Individuals need to participate in regular physical activities especially aerobic exercises which could be in form of aerobic dance as this can help to reduce hypokinetic diseases.
2. Recreational facilities in schools should be provided by the government and non-governmental organization.
3. The government should create a forum for seminar and workshop on various aerobic programmes and their importance and benefit to health. This can also be organized by the health units in all institutions of learning from time to time.
4. The school authorities should inculcate aerobic programmes into the school curriculum in order to promote physical fitness among the students.
5. The government and private organisations should introduce one hour aerobic dance programme three times weekly for their staff which may help in improving work force and efficiency among workers.

REFERENCES

Adeogun JO, Setonji, NA and Dansu A (2003). "Physical Fitness: A Significant Factor in Individual Health Protection" *Matters Arising in Health Education.* Lagos State University, Lagos. Pp. 103-117.

Adeogun JO and Dansu A (2007). Exercise readiness assessment of female undergraduate students of LASU, *Journal of International Council for Health, Physical Education, Recreation Sports and Dance. (ICHPER-SD AFRICA REGION) Ibadan. 2 (2): 110-113.*

Akdur H, Sozen AB, Yigit Z, Balota N and Guven O (2007). The Effects of Walking and Step Aerobic Exercise on Physical Fitness Parameters in Obese Women. *"http/www.tfdergisi.co/pdf-itf-506.pdf"* Retrieved 16/01/2010.

Haastrup EA and Adeogun JO (2005). *Personal Health and Physical Fitness*. Goldnetwork Communications (GNC), Lagos. Pp: 35-44

Haskell WLI, Lee R, Pate K, Powell SN, Blair BA, Franklin CA, Macera GW, Heath PD, Thopson P and Bauman A (2007). Physical Activity and Public Health: Updated Recommendations for Adults from the American College of Sports Medicine and the American Heart Association. *Med Sci Sports Exercise.* **39**: 1424-1434.

Hui E, Chui B and Woo J (2009). Effects of Dance on Physical and Psychological Well-being in Older Persons. Arch Gerontol Geriatr. 49: 45-50. *"http/www.sciencedirect.com"* retrieved 10/01/2010.

Hoeger WK and Hoeger SA (1998). Lifestyle Physical Fitness and Wellness. *Fifth Edition*. Colorado; Morton Publishing Company. Pp: 35-60

Hopkins DK, Murrah B, Hoeger WWK and Rhodes KC (1990). Effect of Low Impact Dance on the Functional Fitness of Elderly Women "*http/gerontologist.gerontologyjournals.org"; retrieved: 27/01/2010.*

Lendsey CBR (2007). Fitness for Life. United States Human Kinetics. Champaign IC; Custom Colour Graphics. 5th Edition.

Mazzeo KS (2002). Fitness through Aerobics and Step Training. Stamford CT; Wordsworth/Thomson Learning. 3rd Edition.

Petrofsky JB, Collins JBL, Yang K, LeMoein T, Bains M, Gunda G, Raju S, Vanaras C,Kim D, Beard Y, Broussard C, Christiensen C, Ellstrom J, George C, Holland I, Vallabhaneni M, and Brown J (2008). Effect of an Aerobic Dance and Diet Program on Cardiovascular Fitness, Body Composition and Weight Loss in Women. *"http/jarcet.com/articles/vol8lss3/179-188"* Retrieved 27/01/2010.

Powers SK and Dodd SL (2003). *Total Fitness and Wellness.* Benjamin Cummings, San Francisco.*3rd Edition.*

Shimamoto H, Adachi Y, Takahashi M and Tanaka K (1998). Low Impact Aerobic Dance as a useful Exercise mode of Reducing Body Mass in Mildly Obese Middle-aged Woman. *Available at http://www.Jstage.jst.gov.jp. Retrieved on 05/04/09.*

Short, S and Short W (1999). Four - year Study University Athlete Energy Demand. *J American Dietic Association*. **5**: 82-86.

Wikipedia (2008). 'Aerobic Exercise. *Available at http://en.wikipedia.org/wiki/Aerobic exercise*. Retrieved 25/01/2010

Wilmore JH and Costil DL (1994). *Physiology of Sports and Exercise*. Bang Printing, U.S.A.