Effects of 8-Week Geordies Joggers Circuit Training nn Selected Body Composition Variables of Obese Female Undergraduates In Tertiary Institutions In Oyo Town

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Abstract

This study examined the effects of an 8-week Geordies Joggers circuit training programme on body composition variables of obese female undergraduates in tertiary institutions in Oyo Town, Nigeria. The study adopted a randomized pretest-posttest experimental design, 70 participants were divided into experimental and control groups. The experimental group engaged in the Geordies circuit training, while the control group did not based on Kinetography Laban theory of movement for the sessions. The t-test statistics were used to compare the difference in the results between the experimental and the control group. The findings from the study showed that there was a significant difference between the pretest and post-test scores of Body Composition of Body Fat per cent (%bf). %bf (Crit-t = 2.00, Cal.t = 3.759, df = 69, p<.05). The result further revealed that there was a significant difference between the pretest and posttest scores of Body Composition Waist-to-Hip Ratio (WHR). WHR (Crit-t = 2.00, Cal.t = 6.538, df = 69, p<.05). Based on the findings of the study, it is recommended that obese female undergraduates should be encouraged to take part in regular Geordies jogger circuit exercise for improved health benefits

Keywords: Geordies circuit training, obesity, female undergraduates

Introduction

There is evidence from studies that youth obesity is approaching epidemic proportion in Nigeria; sedentary screen-based behaviour (such as television watching, video game play, computer use and mobile phone games) is thought to displace physical activity and is independently associated with obesity and other adverse health outcomes in later life such as hypertension, diabetes, coronary heart diseases, respiratory problems and sleep apnea. The prevalence of obesity among the youth is increasing at alarming rates It has become a significant public health concern and remains a challenge for researchers. The World Health Organization, WHO (2022) reported that more than

1 billion people worldwide are obese; 650 million adults, 340 million adolescents including tertiary institution students, and 39 million children, it was also estimated that by 2025, approximately 167 million people including adults and children will become less healthy because they are overweight or obese.

Obesity is a condition where the body accumulates excess fat to the level that affects its health (WHO, 2016). In recent times, Geordies circuit training (CT) has been used as a method for patient recovery (Straudi, et.al, 2022) such as for individuals with metabolic disorders, and degenerative diseases among others. Ramos-Campo et.al (2021) stressed the benefits of CT which included the reduction of body fat, muscle mass gain, and improved muscular strength among others. The prevalence of obesity is a global phenomenon in many developing world. Jordie circuit training involves moving through a circuit of up to 6 or 10 exercises from which each targets different muscle groups or functions.

Body image is a state of an individual's psychological and mental experience of how the body looks like, that is appearance. Many people feel dissatisfied about their body image and thus consider exercise to bring out the best shape look (Ferreira, Medeiros, Nicioli, Nunes, Shiguemoto, and Prestes, 2010). During Geordies Circuit Training (GCT), participants perform each exercise for a specified period and move to the next activity with little or no rest (Kristen, 2023). Undergraduates are not paying attention to the benefits of medical checkups for early medical intervention. The only time they deem it fit is at the point of entry into the school when they will be required to provide some information regarding their health status such as height, weight, genotype, blood group etc, all of which constitute their body makeup. They believe that it is a mere waste of precious time and money and with the erroneous belief that their medical status will not be kept secret. One of the ways by which fitness level can

be determined is through the status of body fat in the body and the waist-to-hip ratio. Training methods that encompass workouts with little time and provide standard fitness need further intervention which serves as an impetus to examine the effects of the 8-week Geordies Joggers circuit Training Programme on some selected body composition variables of obese female undergraduates in tertiary institutions in Oyo town.

HYPOTHESES

1. There will be no significant main effects of treatment on the Body composition variable of Percent body fat (%bf) of obese female undergraduates in Oyo Town.
2. There will be no significant main effects of treatment on the Body composition variable of Waist-to-hip ratio (WHR)] of obese female undergraduates in Oyo Town

METHODOLOGY

The randomized pretest-posttest experimental research design was used for this study. It involves a careful measurement of the participants which was made before treatment was given (pretest) and subsequently another measurement (posttest) was made. The observed differences between the two measurements were then taken as the effect of the treatment given earlier on. The populations for this study were tertiary institutions' obese female undergraduates in Oyo Town. Eighty (80) obese female youths took part in this study, ten (10) could not continue due to increased level of intensity as regards exercise principles of loading, meanwhile, only 70 were able to finish to the end. A purposive sampling technique was used to select the participants for the study because the peculiar characteristics required a BMI $\geq$25.0 as the yardstick to qualify. The participants were selected from tertiary institutions in Oyo town: Emmanuel Alayande University of Education, Federal College of Education (Special), Federal Survey School, and Ajayi Crowther University, Oyo. This restriction helped to minimize to the barest minimum the effect of nutrition on body composition variables in this study. The participants were randomly assigned into two (2) groups (30 participants per group), the experimental and the control group. The experimental group were assigned to 8 weeks of Geordies Joggers circuit training sessions in Emmanuel Alayande College of Education gymnasium while the control group was placed on placebo (20 minutes

contact/week lesson of healthful lifestyle education) in Federal College of Education (Special).

The following inclusion criteria were adhered to in this study:

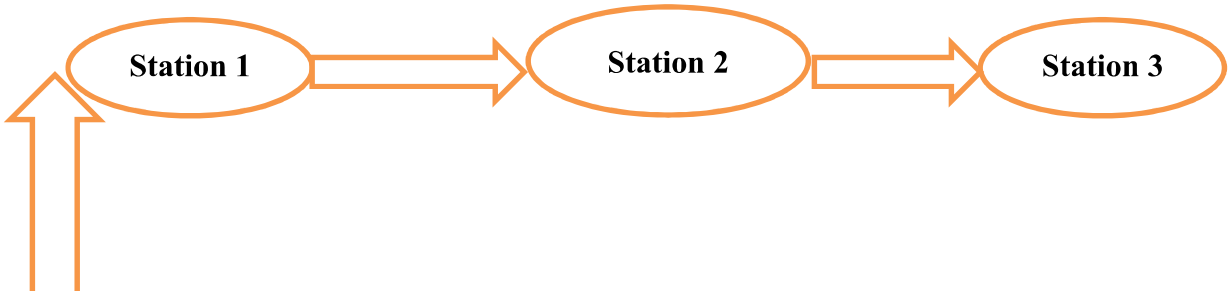
1. Undergraduate female students in colleges of education and university (NCE and B.Sc.Ed) in Oyo town.
2. Participants who had no medical reports contra-indicating exercise participation.
3. Participants who were not engaged in any exercise programme four weeks before, during and after the recruitment of this study.
4. Obese female undergraduates with BMI ≥25.0 to determine the level of obesity.

The following participants were excluded from this study:

1. Participants with cardiorespiratory disease and other metabolic conditions.
2. Participants with heart rate above 100 bpm-pretest.
3. Participants with a tendency towards fainting or dizziness.
4. Drop-out participants.

The following research instruments were used to collect data for the study at the Emmanuel Alayande University of Education, Exercise Physiology Laboratory (Pre and Post data): Bathroom weighing scale, Non-Elastic Measuring tape, Skinfold callipers, Stopwatch, Musical tape, and Cone.

Geordies Joggers Circuit Training programme was performed for 8 weeks, 3 days/week, 20 minutes/day and 3 sets per session. The total time (30 minutes) of the training programme was divided into warming up (5 minutes), main training programme (20 minutes) and cooling down (5 minutes) in the morning of the training days (7:30 am) at the Emmanuel Alayande University of Education sports field. The training programme was 50% target heart rate at the beginning (1st week) and 65% target heart rate at last (8th week). Dependent variables of pulmonary function and body composition of the participants were measured at the beginning and the end of the training program.



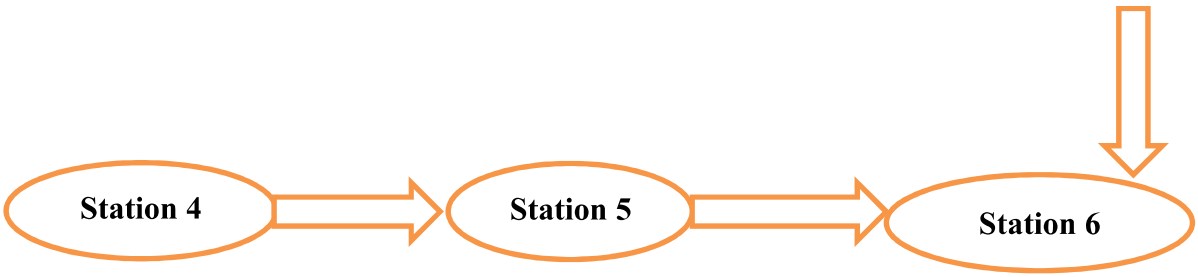


Fig 2: Adopted from Active School (2012)

For an outline of the programme design, a series of six rows, each consisting of five stations and a jogging station. Five trained research assistants were placed at each station to demonstrate the required movements. The following exercises were performed at each station and changed every week to avoid exercise monotonous:

Station 1: standing jump

Station 2: kick butty

Station 3: tap back

Station 4: jumping jack

Station 5: alternate toe touch

Station 6: jogging

The participants were distributed to each station; five (5) participants were at each station. The extra group are the joggers, who jogged once around the 40-meter (length) by 20-meter (breadth) perimeter of the circuit area, keeping together. When the joggers return to the start location "change" is called. All groups rotate 1 station. A new group becomes the joggers at station 1 and the joggers join the physical activity circuit at station 2. A five-second break was allowed for movement between stations and a rest of 5minutes between sets.

The participants were asked to sign the informed consent form showing their interest to be part of this research work and with readiness to cooperate with the researchers after which the following data (information) were collected before (Pre) and after (Post) training programmes. The following measurements were taken by the researchers and research assistants.

Age: The participant's birthday as at the last age were recorded in years to the nearest birthday.

Body Mass Index: This was used to determine the obesity level of the participant. It was calculated by dividing the participant's weight (in kilograms) by the square of height (in meters) (Weight (kg)/height? (meters)].

Weight (kg): Hanson scale Portable type was used to measure the participant's weight to the nearest kilogram with participants wore very light sport wear and no shoes; arm relaxed by the side, measurement was recorded to the nearest 0.1kg.

Height (cm): The participant heights in centimeter were measured while standing erect looked straight ahead with bare footed against the modified stadio- meter. A ruler was rested on the head of each participant horizontally. Their heights then read to the nearest centimeter.

Percent body fat (%bf): All skinfold values were taken from the entire participant's body right side. The participant stood in a relaxed position; the appropriate anatomical landmarks were carefully located and marked with a marker. The skinfold at the various sites was picked in between the index finger and the thumb of the left hand in other to ensure that, the two layers of the skin and underlying fat were included. The calliper was held with the right hand and gently applied perpendicular to the skinfold about 1cm from the gripping fingers to clamp the skinfold. Skinfold measure while reading off on the calliper's meters, one to two seconds after clamping, to the nearest 0.5mm. Three measure sites were taken as the average computed. The 3-sites included abdominal, uprailliac and triceps.

Scoring: Converted the skinfold measure to per cent body fat. Jackson, Pollock and Ward (1985) equation for estimation %body fat was used: %fat = (041563 x sum of skinfolds) - (0.00112 x square of the sum of skinfolds) + (003661 x age) + 4.03653. Reliability = 0.825

Waist-to-hip ratio: Participant's waist circumference with the use of flexible tape measure were taken around the smallest area of the waist typically above the navel 2.54cm, the hip circumference of the hip was then take at the largest area of the buttocks.

Scoring: the circumference was recorded to the nearest centimetres, and the waist girth by hip girth (WHR = Gw/Gh)

RESULTS

Demographic Characteristics of Respondents

Table 1: Weight of Respondents in Kilograms

Weight (kg)	Frequency	Per cent
61-70	9	12.9

71-80	30	42.9
81-90	30	42.9
90+	1	1.3
Total	**70**	**100**

Information on table 1 shows that 9(12.9%) of the participants weighed 61-70Kg, 30(42.9%) weighed 71-80Kg, 30(42.9%) weighed 81-90Kg and 1(1.3%) weighed 90Kg and above. The above data was the pretreatment measurements of all the participants.

Table 2: Heights of Respondents in Centimeters

Height (cm)	Frequency	Per cent
145-155	13	18.6
156-165	45	64.3
166+	12	17.1
Total	**70**	**100**

Information on table 2 shows that 13(18.6%) of the participants had 145-155 cm, 45(64.3%) had 156-165 and 12(17.1%) had 166 cm and more.

Table 3: Distribution of the participants by Class of obesity

Class of obesity	Frequency	Percentage	Norms	Interpretations
Class 1 obesity	45	64.3	25.0-30.0	Average
Class 2 obesity	12	17.1	30.0-35.0	Fatter than average
Class 3 obesity	12	17.1	35.0-40.0	Fat
Class 4 obesity	1	1.5	40.0-above	Overfat
Total	**70**	**100.0**		

Using the classification of Japan (2013), table 3 shows that 45(64.3%) of the participants were class 1 obese which was at an average level compared to the norms, 12(17.1%) class 2 obese were fatter than average level, 12(17.1%) class 3 obesity were

fat compared to the standard norms while 1(1.5%) class 4 obesity was categorized as over fat as described above. The above table revealed that all the participants were above the recommended normal height and weight expected of their age.

Table 4a: T-test table of % Body Fat (BF)

Variable		N	Mean	Std. Dev.	Crit-t	Cal-t.	df	P
% BF	Pretest	70	33.8013	4.0983	2.00	3.759	69	0.001
	Posttest	70	23.7619	2.7892				

Information in Table 4 shows the results of the significant difference between the pretest and post-test scores of Body Composition of Body Fat per cent (%bf). %bf (Crit-t = 2.00, Cal.t = 3.759, df = 69, $p<.05$). The hypothesis was rejected indicating a significant difference between the pretest and posttest %bf

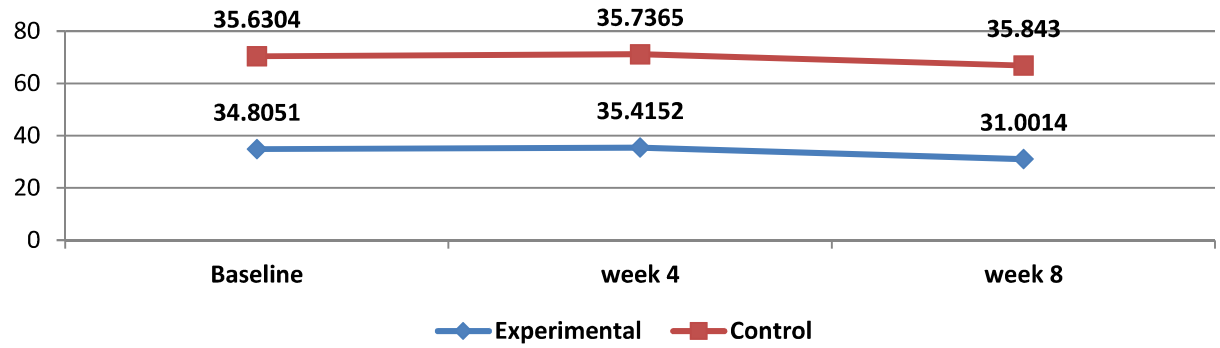
Table 4b: Estimated Marginal Means of Treatment Groups on %BF

Treatment	Mean	Std Error
Experimental Group	21.365	0.331
Control Group	38.041	0.250

From table 4b, it was revealed that participants in experimental group had a lower estimated mean score of 21.365 while participants in control group had a mean score of 38.041. This shows that participants in experimental group perform better than those in control group.

Table 4c: The Average %BF of Obese Female College Students Per Week

Fig 1: Line graph showing the mean scores of %BF of the respondent in Eperimental and Control groups in the basline, 4th week and 8th week



The above line graph indicates that the treatment was effective between the week 4 and week 8 but there was no significant effect between the baseline and the week 4. This may be a result of the principle of exercise conditioning

Table 5a: Analysis of WHR

Variable		N	Mean	Std. Dev.	Crit-t	Cal-t.	df	P
WHR	Pretest	70	0.7142	5.626E-02	2.00	6.538	69	0.000
	Posttest	70	0.6332	4.693E-02				

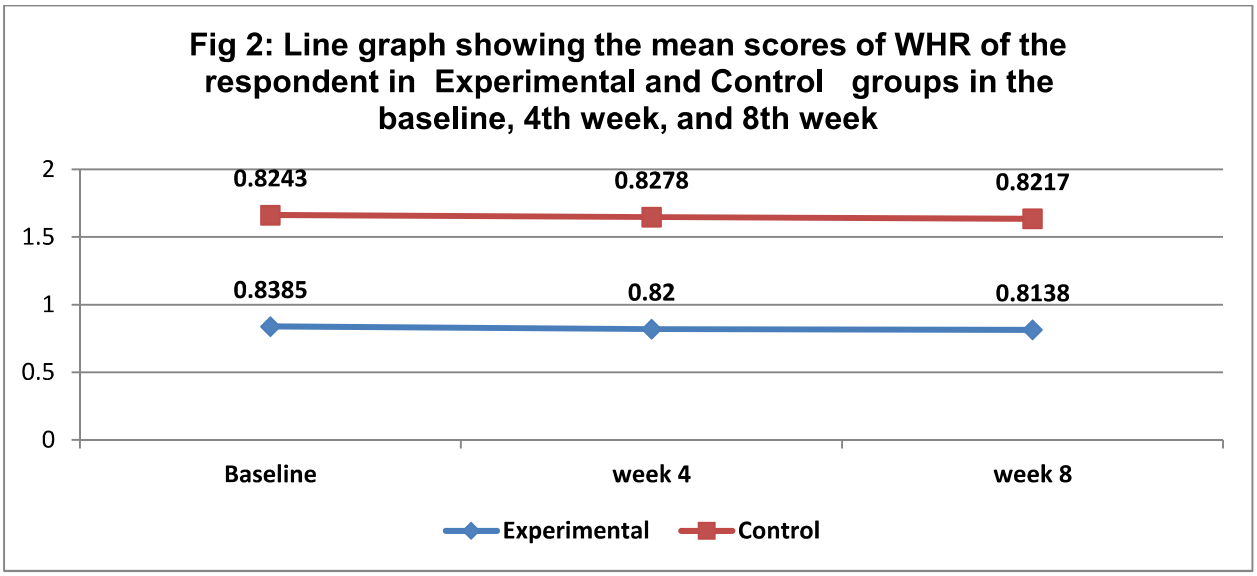
Table 5a shows the results of the significant difference between the pretest and posttest scores of Body Composition Waist-to-Hip Ratio (WHR). WHR (Crit-t = 2.00, Cal.t = 6.538, df = 69,p<.05). The hypothesis is rejected.

Table 5b: Estimated Marginal Means of Treatment Groups on Waist Hip Ratio (WHR)

Treatment	Mean	Std Error
Experimental Group	.665	0.011
Control Group	.749	0.009

Table 5b reveals that participants in the experimental group had a lower mean score of 0.665 while participants in control group had a mean score of 0.749. This shows that participants in experimental group perform better than those in control group.

Table 5c: The Average WHR of Obese Female College Students Per Week



The line graph indicates that the treatment was effective between the baseline, week 4 and week 8 but there was no effect between the baseline and week 8 among the control group.

DISCUSSION OF FINDINGS

The study examined the effects of 8-week Geordies joggers circuit training on selected body composition variables of obese female undergraduates in tertiary institutions in Oyo town. The study revealed that Geordies joggers' circuit training intervention led to a significant decrease in measurements of body composition. Because the participants of the control group did not engage in any form of physical activity, it was clear that the researchers did not expect any significant changes in body composition, and the significant changes to the values can be explained by the inactivity of these subjects. The results of this study reveal that there were decreases in participants' body composition based on % BF. This is a result of the overload principle of increasing the tempo of music corresponding to an increased MaxHR of 45%-69% predicted MaxHR. The results of the findings were in line with Gelson, et.al, (2024) in their study reporting that Geordies circuit training (GCT) had significant effects on body composition most especially reductions in body fats and an increase in lean body

mass. It was further stressed that GCT is effective in enhancing neuromuscular fitness, especially with prolonged and progressive regimented style. Similarly, Kamil, et.al, (2023), from the findings of their study which involved 30 overweight female students aged 14 who were subjected to a 12-week intensified geordies circuit training (ICT) programme posited a significant BMI decrease from 35.4 ±3.4 to 30.9 ± 2.9 in the experimental group which implies that exercise is beneficial for reducing % body fat through intensifying and elongating it will yield more significant charge.

Furthermore, the study revealed that there was a significant main effect of treatment on the Body composition variable of Waist-to-hip ratio (WHR)] of obese female undergraduates in Oyo Town. This finding was in line with Jeneviv, et.al, (2023), in their study on 90 female undergraduates with 45 in the experimental group, their findings revealed a significant reduction in waist circumference. Also, the finding of the study was at variance with Jeneviv et.al. (2023) in their study that there was no significant difference in the mean waist-hip ratio between the control and intervention group of participants of the age range 35-45 years. This variance could be a pointer to the fact that the age of participants of this study was younger and the magnitude of change is small because of the duration and intensity of the exercise session.

CONCLUSION

The 8 weeks Geordies Jogger circuit training programme elicited significant changes in the values of body composition (percent body fat and waist-to-hip ratio) of obese female undergraduates, the values of body composition of obese female undergraduates significantly decreased from the 4th to the 12th week of Geordies Jogger circuit training.

RECOMMENDATIONS

It was recommended that Obese female undergraduates should endeavour to take part in regular Geordies jogger circuit exercise for improved health benefits. Exercise trainers, coaches and exercise physiologists should consider the principle of exercise frequency, intensity, type and time (FITT) and other factors which will decrease the body composition as used in this study when planning the exercise programme. Geordies jogger circuit training exercise can usually be accommodated with less stress by people of all ages and fitness levels. This is one of the unique characteristics of Circuit Training, in that the same step can be modified by the participants to meet the needs of their workout. Also, Regular BMI monitoring should be undertaken as an important way to monitor and prevent the occurrence of obesity among female undergraduates.

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