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Effects of a Six-Week Aerobic Exercise Program with Music in Modulating Body Composition among Overweight and Obese Women at a College in Chitungwiza, Zimbabwe

Magoshe, Violet[1], Kugara, Shepard[2]

[1]Department of Physical Education and Sport ,Zimbabwe Open University, Harare, Zimbabwe, Email : violetm676@gmail.com
[2]Department of Physical Education and Sport, Zimbabwe Open University, Harare, Zimbabwe, Email: kugashe@gmail.com

ABSTRACT

Obesity and overweight are a threat to the health of modern urban dwellers, especially women. The study was concerned with the effects of an aerobic program with music in modulating body composition among overweight and obese women with particular focus on female students from a teacher's college in Chitungwiza. The research study adopted the quantitative approach and was prompted by the prevalence of obesity and overweight among young women especially of the reproductive category. The study was comprised of a total of 76 female students' teachers. It is from this sample that the experimental group and control group were derived using the random sampling method. The instruments used were a stadiometer, body weight scale or bathroom. The research results confirm a non-significant of effect on weight loss among obese and overweight women participants during a 6-week aerobic exercise irrespective of the overall duration of the exercise. Programs lasting up to twelve months are effective when it comes to the modulation of body composition, waist and thigh circumference and fat reduction. It is recommended prolonged aerobic dance workouts as an essential role in influencing body composition in terms of weight loss and that aerobic dance exercises must be practiced more frequently and for a longer period of time in order to reduce overweight and obesity in women of various ages. More studies must be undertaken to assess their impact on weight reduction in women using other interventions which encompass Cross fit and resistance training methods accompanied with music

Keywords: aerobics, overweight, obese, African women, 6 week programme, cardio

1. Background to the study.

Obesity is not just a health concern, but a pressing issue that demands our immediate attention. Particularly, women aged 30 to 45 are at risk. WHO (2000) defines obesity as a condition characterized by excess or substantial body fat to the point where health is jeopardized. According to Friedman (2000) and WHO (2000), both developed and developing nations have seen an increase in the number of individuals who are obese in recent years. Obesity is connected to an increased risk of developing chronic diseases such as cardiovascular disease, type 2 diabetes mellitus, and cancer, according to research conducted by Hasslum et. al (2005) and Visscher et al. (2001). Therefore, urgency of the obesity problem is evident, and practical measurements and treatments are necessary. In 2016, the WHO reported that 39% of adults aged 18 and above were overweight (39% of men and 40% of women). Thus, obesity is high in women and measures should be implemented to help everyone.

According to Simşek et al. (2005), many people engage in less physical activity. Most unemployed women spend the majority of their time idle; therefore, the food they consume causes them to become obese and overweight. According to Günay et al. (2014), decreased physical activity and poor nutritional habits contribute to increased levels of saturated fat and excessive sugar consumption. Günay et al. (2014) say that a lack of exercise has made obesity a global concern, not only in rich countries. Günay et al. (2014) were supported by Li et al. (2013), who echoed that the widespread use of advanced technological instruments (including mobile phones, televisions, laptop computers, and home entertainment systems, amongst many others) that quickly fill our recreational time has played a significant role to the rise in obesity. Thus, humans get little or no exercise, preferring to spend their time sitting, ordering food over the phone and having it delivered to their door.

Overweight is another health issue that affects women (Esin & Aktaş, 2012). In social life, there has been a decrease in the physical strength-based housework of homemakers or working ladies. Because these actions in household chores are repetitive and monotonous, energy expenditure increases appropriately, which helps to maintain body composition (Arslan & Ceviz, 2007).In other words, the day-to-day duties women undertook were quite important. These might keep most women awake, resulting in exercise and a well-maintained body composition.

According to Akinboboye et al. (2003), recent studies have demonstrated that the prevalence of cardiovascular disease (CVD) is higher in African people who are obese, while it is unclear if these two findings are related. According to Yusuf et al. (2001), there has been an increase in the prevalence of

obesity in Africa in recent years, which could be ascribed to increased urbanization and the corresponding ease of access to a more westernized, calorie-dense diet.According to an American Psychological Association (APA) survey conducted in March 2021, over 42% of Americans gained more weight than planned due to a sedentary lifestyle during COVID-19. Because individuals were urged to stay indoors to prevent the spread of Covid 19, the day's activities were eating and sleeping. As a result, bodies began to develop, culminating in obesity and overweight. Most participants gained an average of 30 pounds as a result of their excessive eating and sleeping, according to Melamed et al. (2022).This is a cause for concern and interventions are needed to address the situation.

In Zimbabwe, physical activity levels declined and reported weight gain occurred throughout the lockdown period, increasing the risk of being overweight or obese, particularly in women (Matsungo et al., 2020). However, the link between happiness and women's stature has led many African women to reject weight loss in favour of maintaining large/obese bodies, compromising on a variety of health conditions. A married African lady is expected to gain weight as an indication that her family is doing well. There is a widespread belief that if an African woman is thin, her family is poor. However this perception contradicts the notion of losing weight to stay healthy.According to Musaiger et al. (2012), being overweight has been connected with wealth, health, agility, and fertility in many African and Arabic cultures; however, Swami et al. (2007) suggest that slender body size is frequently admired in the Western world. Furthermore, Sermo (2015) argued that in societies prone to food shortages or famine, obesity was viewed as a symbol of riches and social position. Obesity can also be viewed as a symbol within a prestige system. Obesity was thus viewed as a symbol of success, power, and money worldwide. Based on the foregoing facts, Sermo (2015) concludes that African women are expected to gain weight when they marry, and if they do not, they are deemed unwell cared for by their husbands. This belief, however, has contributed to the obesity of most African women and is now regarded as a matter of concern. However, increasing attitudes toward a more Western body ideal have been documented in non-Western cultures (Musaiger, 2011.In relationship with this study, women play a crucial role in the rearing of children and thus have a significant impact on promoting good health. This underscores their responsibility in combating the issue of obesity and overweight. Given the growth of urban living, its related disorders, and the different impacts of aerobic exercise on the body, more research in this field is required. According to Goodwin (2005), a consideration on using aerobic exercise to reduce obesity in individuals, alleviates obesity in women and prevent numerous diseases as well as boosting women's physical and mental health. This highlights the empowerment and responsibility of women in the fight against obesity.

Physical activities and reasonable fitness are not just beneficial, but essential for human existence and health (Mishra, (2013); Blair, (2004) agrees that regular physical activities generate significant changes in the body, which manifest as enhanced health and fewer risk factors in the lives of inactive individuals. Aerobic exercises, in particular, are said to be crucial in enhancing body composition, lowering body weight and blood glucose levels. Therefore, both men and women must s exercise daily. Many authors, including Fatima (2004) and Freeman et al. (2001), concluded that aerobic activities benefit inactive people and cardiac patients. Simple regular activities, such as a daily 20-minute brisk walk, might be helpful to health (Fatima, 2004). Furthermore, Fatima (2004), spelt out that exercise improves body composition and muscle strength, reduces falls, diabetes, and the risk of coronary artery disease, joint pain, and depression, improves quality of life, and increases life span.

Aerobic exercise regimens are increasingly being employed around the world to regulate body composition in some overweight and obese persons. According to Fatima (2004), aerobic exercise programs with music are unique in their potential to stimulate people to exercise in ways other routes cannot. Many actors are interested in the concept of altering body composition. Aerobic activities are a mechanism for excellent body mass maintenance, balanced blood glucose levels, fat burning, and muscular tone improvement.The American College of Sports Medicine (ACSM) defines an optimal dose of physical activity as a tempo that allows people to feel comfortable and encourages inactive people. The ACSM suggests that healthy individuals exercise at least thirty minutes of moderate-intensity cardiovascular exercise five days a week (Focht, 2013). Based on this background, the study examined the effects of a six-week aerobic exercise program with music on modulating body composition among overweight and obese women at a teachers' college in Seke, Chitungwiza.

1.3 Objectives of the study

The following objectives govern the research.

- To establish the effects of a six-week aerobic exercise program with music to modulate body composition among overweight / obese women at college in Chitungwiza.
- To address the overweight and obesity-related health complications and among women.
- To modulate the overweight and obese women through the intervention strategy of a six-week program.

1.4 Research questions

- What is the effect of a six-week week aerobic exercise program with music to modulate body composition among overweight/obese women at a college in Chitungwiza?
- What are the health problems associated with obesity and overweight among women?
- How can the intervention strategy of a six-week program be implemented to modulate overweight and obese women?

2.0 Literature review

The following literature guides the study and provides the knowledge gap. The review is guided by subheadings

2.1 Health problems associated with overweight and obesity among women.

Overweight is one of the top ten health concerns in the world, according to the World Health Organization (WHO), and one of the top five in developed countries. Obesity and overweight were once linked with high-income countries, but they are now common in poor and middle-income countries as well. According to the poll, females are more likely than males to be obese. As a result, they must participate in exercise programs in order to maintain a healthy lifestyle. Flegal et al. (2016) list several obesity-related illnesses that affect women exclusively or primarily. These include, among other things, osteoarthritis, congenital disabilities, breast and endometrial malignancies, cardiovascular and gallbladder illnesses, infertility, gynaecological difficulties, and discrimination. Mosha et al. (2017) stated that research conducted in Tanzania revealed that Tanzania is no different, with overweight and obesity in women of reproductive age increasing dramatically between 2010 and 2015, rising from 21.5 to 28%. It was revealed that the prevalence of overweight among women in cities is double (42%) that of women in rural areas (21%) (Tanzania Ministry of Health, 2015)

Overweight and obesity are serious public health concerns that impact almost half of the world's adult population, with women having a higher prevalence than men (Bhurosy& Jewson, 2014; WHO, 2020). According to a study conducted in Zimbabwe by Mangemba and Sebastian (2020), which was cited in (WHO,2018), being overweight or obese is a developing pandemic, with the occurrence trebling in 41 years (1975-2016); today, 39% of individuals worldwide are overweight (39% men and 40% women), with 13% obese (11% men and 15% women). Being overweight causes more than 4 million deaths worldwide, with cardiovascular disease accounting for two-thirds of them (Collaborators et al., 2017). This is the purpose of the study to examine an intervention which can help to reduce obesity in overweight and obese women.

2.2 Aerobic exercise program with music.

According to a study by Tsai et al. (2021) and Kao et al. (2021), 12 weeks of moderate-intensity aerobic exercise mixed with resistance training did not improve reaction speeds in obese women conducting the Stroop test. However, this does not discount the potential of aerobic exercise. It is worth examining if obese people's body composition improves after six weeks of cardiovascular exercise with music intervention. Aerobic exercise at a low to moderate intensity, i.e. 50% - 80% of maximum pulse, provides training load. Siska (2020) further articulates that exercises lasting 15 minutes to an hour are the boundaries of the body's ability to develop the organism's system and boost the body’s physiological function so that it works efficiently. Conducting aerobic exercise can help one lose weight. Ozemek et al. (2019) also stated that extra fat in the body will be used as a source of energy during aerobic exercise. The more frequently persons with excess fat in their bodies engage in aerobic exercise, the more optimal fat burning in the body will become. Aerobic exercise reduced body weight by 66 78% and body fat percentage by 86 .42% (Utomo, 2012). Therefore aerobic exercise can reduce body fat levels, offering hope in the fight against obesity.Other studies underscores the importance of exercise in obese pregnancy in reducing long-term cardiovascular risk to the infant. It also highlights the necessity of follow-up studies throughout life, emphasizing the continuous need for research and development in this field. While not all exercise and lifestyle intervention programs during pregnancy have been shown to have direct benefits for the mother and new born, there is a clear need to model intervention strategies like modulation of overweight and obese women through the intervention strategy of a six-week aerobic exercise program. This stresses the importance of follow-up studies and makes the audience feel the necessity of continuous research and development in obesity prevention.

2.3 The effects of an aerobic exercise program with music to modulate body composition among overweight and obese women.

Numerous authors advocate for various types of aerobic exercise, citing their benefits in preventing various ailments and enhancing one's health. The increasingly popular group fitness regimes, such as pre-programmed forms of physical training to music, have favourable impacts on body composition among women, such as a decrease in body mass and fat, resulting in an improvement in overall physical attractiveness (Hadzovic, 2020). Another study discovered that young women are more inclined to go on physical activity and exercise connected to fitness as they are more unsatisfied with their body image (Gholinejad et al., 2019). According to a study conducted in 2018 by Katoul, increased physical activity in terms of health and physical fitness is connected with lower mortality and disease, quality of life, psychological indicators, body composition, basic skills training, and balanced metabolism. According to Afriani et al. (2021), regular physical activity provides various benefits, including a lower risk of infection, cardiovascular disease, and diabetes, certain malignancies, and depression, as well as enhanced personal satisfaction and good mood.

Aerobic exercise is necessary for people to maintain their body form(Gusvominesia et al. (2019). According to Chiu et al. (2017), aerobic exercise is a sport that can be traced back to European societies' traditional and synchronized motions. Several sources agreed on aerobics, stating that the general norm for aerobics classes is the same. Warming up and doing aerobics or cardiovascular activities, stretching and flexing exercises on specific muscle joints, endurance movements, and chilling are all part of it. Furthermore, Chiu et al. (2017) claimed that aerobic exercise has a good effect on most body organs, contributing to caloric balance and body weight regulation. According to Elkington (2017), aerobic exercise is a short and moderately long activity accompanied by music and powered by an aerobic device. According to Schwender (2018), among diverse exercises, women prefer rhythmic and coordinated exercises such as aerobic exercise over other sports. According to Schwender (2018), sports, particularly aerobic sports, may cause alterations in energy balance, an increase in the release of metabolic hormones, an increase in appetite, and obesity.

According to Sema (2019), aerobic activity raises peak oxygen consumption (VO2 peak), which is closely correlated to total body fat percentage (BF %). According to Chiu et al. (2017), aerobic exercise is also a potent technique for weight loss, particularly in reducing body fat. According to a recent study conducted in Indonesia in 2021, aerobic exercise is a sequence of movement activities that primarily enhance metabolic ability, namely cardiovascular ability. All the specialists mentioned above believe exercise is an excellent tool for burning unnecessary fats that can lead to obesity and overweight. Thus, to regulate, burn fat, and stay fit, people must engage in aerobics under the supervision of a trainer.

Aerobic activities are essential in humans' daily lives. Eating and sleeping are not recommended to maintain a healthy body. According to Panday et al. (2017), the correct fitness program can significantly reduce fat levels and body weight in those who are overweight or obese. Aerobic exercise regimens can help overweight and obese women change their body composition. Some research was conducted on the impact of aerobic exercise programs on reproductive women, and various benefits linked with participating in the exercise programs were tremendously realized.Furthermore, Indah (2016) states that there will be an improvement in blood circulation throughout the body, muscles will become stronger, and there will be an increase in muscle mass and a decrease in the percentage of body fat, exposing the entire body to a dangerous situation in which the heart and lungs may begin to malfunction. As a result, aerobic activities must be taken seriously and regularly. Given the growth of urban living, its related disorders, and the different impacts of aerobic exercise on the body, more research in this field is required. With the sound effects of aerobic exercise on reducing obesity in women of reproductive age, a step toward preventing numerous diseases and promoting women's physical and mental health can be taken.

3.0 Research Approach

Different approaches have been making an impact in research, (ACAPS, 2012) argues that an approach is a broad view or perspective of something. The research adopted the quantitative approach and was done to help ascertain the effects of an aerobic exercise program with music in modulating body composition programs for overweight and obese women. The analysis of numerical data is complex and must be addressed systemically. Quantitative data that is carefully gathered, processed, and critically analyzed demonstrates greater reliability. Therefore, the researcher believes that study findings can be generalized to the population about which information is required. Notwithstanding the disadvantages associated with the quantitative approach, the researcher is going to capitalize on its advantages which include the collection of a large amount of data using structured tools and techniques which is relatively speedy and easier in this approach.

3.1Sample and sampling procedure

From a total of 100 overweight female students, convenient sampling was used to come up with an experimental group made up of 38 and another 38 as a control group. The study was comprised of a total of 76 female students' teachers. It is from this sample that the experimental group and control group were derived using the random sampling method. The experimental group took part in aerobic exercises while the control group did not participate. The criteria for choosing the participants was based on the responses from the survey which included the following categories to indicate; age, height, weight, arm circumference, and waist girth among other variables.

3.2 Research instruments

The instruments used were a stadiometer, body weight scale or bathroom Scale and a tape measure. A stadiometer is a long ruler attached to the wall and it is marked in inches and centimetres. It has a horizontal headpiece that is adjusted to rest on top of the head. It is a quick way of accurately measuring one's height. The researcher used the stadiometer to measure the heights of the women selected for the study. Bodyweight scales, also known as a body composition scale, are devices that can help in obtaining a complete picture of one's body composition including body fat, visceral fat and BMI. Also, bathroom scales are used for measuring the weight of a person and are useful for people who are watching their weight, on a diet, or in an exercise program, and this one seems quite ideal for use in this particular research. It is a kind of flexible ruler that is marked in centimetres and inches. The tape measure was used to measure the arm, waist, and thigh girths of the participants during the pre-test session. However, the major instrument to be used will be a 5-day 30 minutes weekly program for six weeks of aerobics training with music of moderate to high tempo.

3.5 Data Collection Methods

In this study, the researcher used an experimental research design as a method of collecting data. Experimental research is commonly used within the framework of the scientific method. The researcher measured the heights of the participant using the stadiometer and will record the obtained scores in centimetres. The participant will stand against the stadiometer with bare feet and the reading was then captured. The bathroom scale was ideal for measuring the participants' weights then recording will be in kilogram readings. The participants were made to stand on the scale with bare feet and a recording is captured, the arm, waist and thigh girths are going to be measured by a Tape measure. The measurements are to be done where there is direct contact with the skin for accuracy. The last and most important procedure is the experimental intervention which will be a 5-day 30 minutes weekly program for six weeks of aerobics training with the music of moderate to high and very high tempo. These data collection procedures will be done during the pre-phase period.

3.6 Data Analysis

The SPSS Version 26 was used for data analysis. It has differentials for the statistical analysis. The analysis (output) was exported from SPSS while the research report was compiled in Word format. The demographic characteristics of respondents were summarized in tables and graphs.

4.0 Data presentation, analysis and interpretation of findings

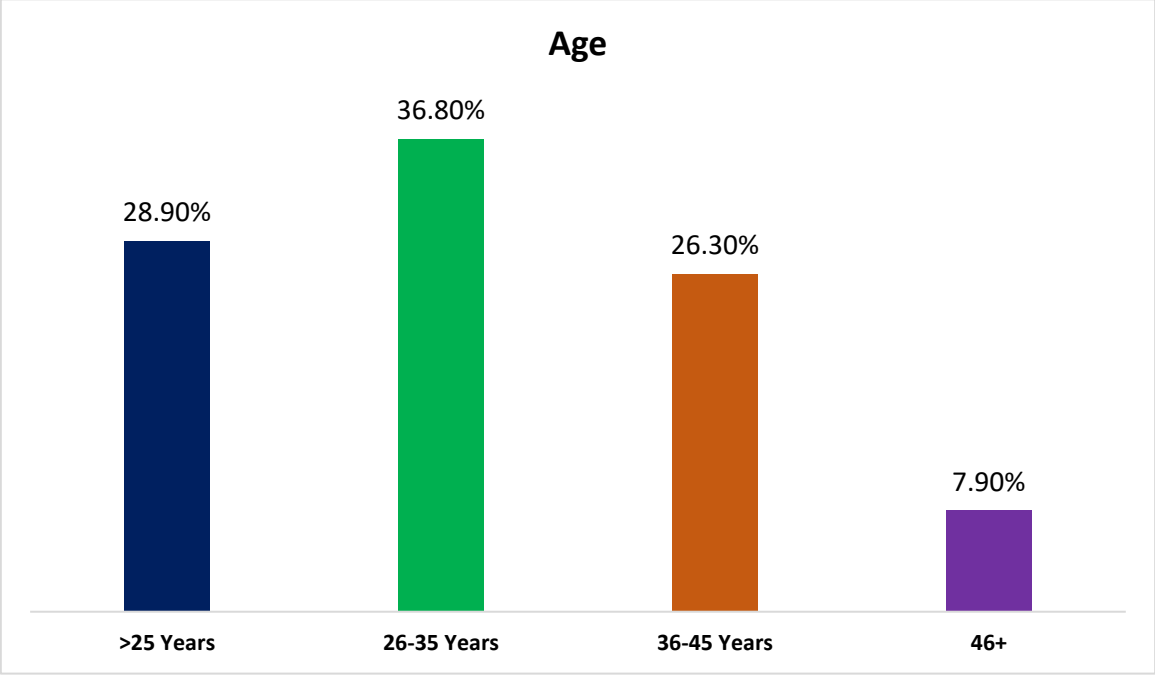
The study was adopted an experimental design employs the quantitative data analysis methods to evaluate the effectiveness of aerobics trainings among women and make conclusive findings based on the statistical power of the analysis. The biographic data such as age and the key treatment grouping will be analysed first to indicate that characteristic of the participants in the experiment. Descriptive analysis of the major covariates and dependent variables on the repeated measures will be presented. Descriptive analysis included mean, mode, standard deviation kurtosis and skewness. The data analysis is done using t-tests, ANCOVA and repeated measures ANOVA for conclusive analysis on the significance and effect size of the data analysed. The analysis of data in this chapter will be based on the data output from SPSS 26 and excel.

4.1 Biographic data of the experiment subjects

This section gives a brief descriptive analysis of the experiment subjects used in this study which includes gender and age

4.2.1 Age

The data below is summary of the age distribution of the experiment participants.



The data above indicates that most of the female students at college are within the range of 25-35 years of age. The 26-35 age category is the most dominant age group with 36.8% (n=14), followed by those below or age 25years with 28.9% (n=11). This age distribution is indicative of student teachers who are training to teachers and who intend to have an extended professional experience after college.

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<25 Years	11	28.9	28.9	28.9
	26-35Years	14	36.8	36.8	65.8
	36-45 Years	10	26.3	26.3	92.1
	46+ Years	3	7.9	7.9	100.0

4.3.2	Total	38	100.0	100.0	

Treatment

The data below summarises the important covariate of the study which the treatment variable.

Treatment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Control	19	50.0	50.0	50.0
	Experiment	19	50.0	50.0	100.0
	Total	38	100.0	100.0	

In the treatment, the experiment divided the participants into two groups which are the control and the experiment group. The data above indicated that both the control and experiment group had an equal number of participants which 50% (n=19) each. Treatment groups are the subsets of research study participants who are subjected to some form of manipulation or deliberate alteration of the independent variable of interest. They are a crucial component of experimental research designs that aid in determining causality and measuring effects (Saunders, et al., 2019)

4.3.3 The table below summarises the treatment of the study

Treatment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Control	19	50.0	50.0	50.0
	Experiment	19	50.0	50.0	100.0
	Total	38	100.0	100.0	

The data shows that the control and the experiment group equally share the number of participants at 50% (n=19). This gives the study a balanced observation in the treatment of the variables under investigation.

4.3.3 Age * Treatment Cross tabulation

The data below summarises the age and treatment cross tabulation in the experiment.

Age * Treatment Crosstabulation				
Count				
		Treatment		Total
		Control	Experiment	
Age	<25 Years	6	5	11
	26-35Years	5	9	14
	36-45 Years	6	4	10
	46+ Years	2	1	3
Total		19	19	38

The age and treatment cross tabulation indicates that there is an evenly distribution of in age in both the Control and Experiment groups.

4.3.4 Pre-test descriptive

Statistics						
		Pretest_Weight	Pretest_Height	Pretest_ThighCC	Pretest_Waist	Pretest_BMI
N	Valid	38	38	38	38	38
	Missing	0	0	0	0	0
Mean		90.03	1.6642	75.5837	100.0947	32.614
Std. Error of Mean		1.570	.00835	2.38033	1.84240	.5799
Median		86.50	1.6650	69.9950	99.0600	31.600
Std. Deviation		9.677	.05150	14.67336	11.35730	3.5745
Skewness		1.002	-.187	1.959	-.011	1.322
Std. Error of Skewness		.383	.383	.383	.383	.383
Kurtosis		.052	.693	2.924	-.214	1.427
Std. Error of Kurtosis		.750	.750	.750	.750	.750

The pretest data indicate that the participants selected were mainly obese women with a mean BMI =32.614, mean thigh CC =75.58cm, mean Waist = 100.09cm. the selected participants are suitable for an experiment on weight loss among obese women using aerobics.

4.3.5 Thigh CC descriptive statistics

The table summarise the data on the repeated tests of thigh circumference in the experiment

Statistics					
		Pretest_ThighCC	Midtest1_ThighCC	Midtest2_ThighCC	Posttest_ThighCC
N	Valid	38	38	38	38
	Missing	0	0	0	0
Mean		75.5837	75.5676	75.5129	75.4813
Std. Error of Mean		2.38033	2.38025	2.37963	2.36534
Std. Deviation		14.67336	14.67286	14.66901	14.58096
Skewness		1.959	1.957	1.960	1.951
Std. Error of Skewness		.383	.383	.383	.383
Kurtosis		2.924	2.918	2.923	2.882
Std. Error of Kurtosis		.750	.750	.750	.750

The data shows a slightly decreasing mean thigh CC from 75.58 in the pretset to 75.48 cm in the posttest. The averages in SD=14, Skewness =1.9 and kutorsis =2.9 show a normal distribution. The decrease can be attributed to the six weeks aerobics programme.

4.3.6 Waist Descriptive statistics

The data below shows that descriptive data of the repeated measures of the waist circumference of the women in the experiment.

Statistics

		Pretest_Waist	Midtest1_Waist	Midtest2_Waist	Posttest_Waist
N	Valid	38	38	38	38
	Missing	0	0	0	0

Mean	100.0947	100.0866	99.6603	99.6155
Std. Error of Mean	1.84240	1.84280	1.84693	1.85463
Std. Deviation	11.35730	11.35976	11.38523	11.43270
Skewness	-.011	-.010	.017	.016
Std. Error of Skewness	.383	.383	.383	.383
Kurtosis	-.214	-.215	-.244	-.273
Std. Error of Kurtosis	.750	.750	.750	.750

The data shows a marginal decrease in the waist line of the participants from a mean of 100.09cm in the pretest to a mean of 99.61cm in the post test. The data describes a change in the weight due to the experiment.

4.3.7 BMI Descriptive Statistics

The data below show the results of the mean BMI of the participants in the treatment.

Statistics					
		Pretest_BMI	Midtest1_BMI	Midtest2_BMI	Posttest_BMI
N	Valid	38	38	38	38
	Missing	0	0	0	0
Mean		32.614	32.422	32.248	31.964
Std. Error of Mean		.5799	.5862	.5814	.5825
Std. Deviation		3.5745	3.6137	3.5841	3.5906
Skewness		1.322	1.292	1.320	1.187
Std. Error of Skewness		.383	.383	.383	.383
Kurtosis		1.427	1.288	1.327	.815
Std. Error of Kurtosis		.750	.750	.750	.750

The data above indicate a decrease in the BMI of the women who participated in the study. There is a decrease from 32.61 in pretest to 31.96 in the posttest BMI index. This indicates that the treatment caused marginal changes in the BMI.

4.4 One Sample t-test on obesity

The study used the World Health Organisation criterion to classify the status of body the participants' body composition as adults. According to WHO BMI criteria, underweight is ≤18.48kgm/m, normal ≥18.50 -24.99kg/m2 and overweight ≥25.0kg/m2 -29.99kg/m2 while obesity is ≥30.0kgm2 (World Health Organization, 2019). One sample t-test on overweight indicated that all the BMI test from pretest to posttest had a significant overweight index.

One-Sample Test						
	Test Value = 25					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Pretest_BMI	13.131	37	.000	7.6142	6.439	8.789
Midtest1_BMI	12.661	37	.000	7.4221	6.234	8.610
Midtest2_BMI	12.466	37	.000	7.2476	6.070	8.426

Posttest_BMI	11.957	37	.000	6.9645	5.784	8.145

The data above indicates the BMI of the participants had a p=0.00<0.05 signifying that at all repeated measures the participants were found to have a BMI that was over weight.

4.4.1 One sample t-test on overweight.

The study carried out a sample t-test using the test score of 30 which according to WHO is the index of obesity.

One-Sample Test

Test Value = 30

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Pretest_BMI	4.508	37	.000	2.6142	1.439	3.789
Midtest1_BMI	4.132	37	.000	2.4221	1.234	3.610
Midtest2_BMI	3.866	37	.000	2.2476	1.070	3.426
Posttest_BMI	3.373	37	.002	1.9645	.784	3.145

The data in the table above indicates that all the tests of BMI had a significant obese result as the p=0.00<0.05. This data comparatively can mean that the six weeks aerobics exercise did not significantly change the BMI of the participating women in the programme.

4.4.2 Independent T-test BMI

The study carried out an independent samples t-test. The Independent Samples t Test compares the means of two independent groups to determine if there is statistical significance that the associated population means are statistically significantly different.

Group Statistics

	Treatment	N	Mean	Std. Deviation	Std. Error Mean
Posttest_BMI	Control	19	32.254	3.1050	.7123
	Experiment	19	31.675	4.0844	.9370

The group statistics above indicates that in the posttest of BMI the mean of the control group is M=32.254kg, SD = 3.1050 and SEM =0.7123, and the mean of the experiment group is smaller than the control group at M=31.675, SD=4.0844, SEM=0.9370. This descriptive static shows a difference in mean but does not show if it is significant hence the t-test below.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest_BMI	Equal variances assumed	.719	.402	.492	36	.625	.5795	1.1771	-1.8077	2.9667
	Equal variances not assumed			.492	33.596	.626	.5795	1.1771	-1.8137	2.9726

The data above indicate F(2,36)=0.719, p=0.404>0.05, t=0.492, MD=0.5795, CI=-1.8077-2.9667. These results indicate that there is no significant difference between the two independent samples hence the manipulation in the experiment group did not cause any statistically significant change in BMI of the participants comparative to the control group.

4.4.3 The Paired Sample T Test BMI

The paired sample t-test indicated that the mean of pretest and post were different therefore a paired sample t-test was carried out.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest_BMI - Posttest_BMI	.6497	.7223	.1172	.4123	.8872	5.545	37	.000

The data above indicate a statistically significant change in the pretest and posttest BMI where t(1,37)=5.545, p=0.00<0.05, CI=0.4123-0.8872. The significance in the results shows that there is no difference between the two paired samples despite the previously indicted difference in descriptive statistics.This shows that the data shows that the participants remained in the overweight category.

4.5 One T-test for Thigh CC

The average female thigh size in this study has been 55.1 cm based on the National Research Council (US) Committee on Diet and Health. Diet and health (National Research Council (US), 2018). It shows the thigh CC per age as follows 20-29 years old: 55.1cm- (45.4cm-68.6cm); 30-39 years old: 55.1cm- (46.7cm-65.0cm) and 40-49 years old: 55.0cm- (46.8cm-65.0cm). (National Research Council (US), 2018).

The table below indicates that results of the one sample t-test based on the test score of 55.1 cm.

One-Sample Test						
	Test Value = 55.1					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Pretest_ThighCC	8.605	37	.000	20.48368	15.6607	25.3067
Midtest1_ThighCC	8.599	37	.000	20.46763	15.6448	25.2905
Midtest2_ThighCC	8.578	37	.000	20.41289	15.5913	25.2345
Posttest_ThighCC	8.617	37	.000	20.38132	15.5887	25.1740

The data above shows that there is a significant results with all the measures of the thigh CC being above 55.1 cm despite previously indicated reduction in the thigh CC. The aerobics exercises show that they had no statistically significant impact on the reduction thigh CC.

4.5.1 Independent T-test on thigh CC

The further carried out an independent t-test to confirm if there is a significant difference between the experiment and the control group.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest_ ThighCC	Equal variances assumed	.008	.929	-.089	36	.930	-.42474	4.79542	-10.15030	9.30083
	Equal variances not assumed			-.089	35.992	.930	-.42474	4.79542	-10.15037	9.30090

The data above indicates an F(2,36)= 0.008, p=0.929, t=0.089, CI=-10.150-9.300. the data shows that there is no statistical significance on the difference between the control and experiment group on Thigh CC in the post test.

4.5.2 Paired Sample t-test on Thigh CC

Paired Samples Test								
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest_ThighCC - Posttest_ThighCC	.10237	.22444	.03641	.02860	.17614	2.812	37	.008

The data above show a p=0.008<0.05 to signify that there is no difference in thigh CC of the participants. The significance in the results shows that there is no difference between the two paired sample despite the previously indicted difference in descriptive statistics. This shows that the thigh CC data of participants remained in the overweight category.

4.6 One sample t test for Waist

The average female weight circumference in this study is 88 cm based on the National Research Council (US). (National Research Council (US), 2018) The data below is a one sample t-test carried on the waist line of the female participants in the study.

One-Sample Test						
	Test Value = 88					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Pretest_Waist	6.565	37	.000	12.09474	8.3617	15.8278
Midtest1_Waist	6.559	37	.000	12.08658	8.3527	15.8204
Midtest2_Waist	6.313	37	.000	11.66026	7.9180	15.4025
Posttest_Waist	6.263	37	.000	11.61553	7.8577	15.3734

The data above show a p=0.00<0.05 in the entire repeated waist measuring in the experiment. This indicates that all the participants had a waist circumference that was above the average.

4.6.1 Independent T-Test for Waist

The study compared the control and experiment posttest waist circumference to asses if there is a significant difference in the means. The table below shows that results from the test.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest_Waist	Equal variances assumed	.001	.974	-.044	36	.965	-.16474	3.76032	-7.79102	7.46155
	Equal variances not assumed			-.044	35.988	.965	-.16474	3.76032	-7.79111	7.46164

The data in the table above shows the following results F(2,36)=0.01, p=0.974>0.05, t=0.044; CI= -7.791-7.461. The result show that there is statistically significant difference between the control and the experiment group after the aerobics exercises meaning that there was not much significance in weight reduction.

4.6.2 Paired Sample T-test for Waist

The paired sample test compared the pretest and posttest wait sizes to check if there was any statistically significant difference. The null hypothesis for the paired sample is that there is no difference on the two sample.

Paired Samples Test							
	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			

Pair 1	Pretest_Waist - Posttest_Waist	.47921	.70762	.11479	.24662	.71180	4.175	37	.000

The data above shows that there is no statistical difference between the two pairs as the p=0.00<0.05. this shows that the aerobics did not cause any significant changes in the waist circumference of the participants.

4.7 Repeated Measures ANOVA.

In this study the repeated measures ANOVA was used because there were same measurements that participants were rated at more than two time points. If the study had only two points the paired sample t-test would have been a sufficient measure but the study requires a repeated measure ANOVA to effectively cater for the pretest, midtests and posttest.

4.8 Repeated Measures ANOVA BMI.

The study carried out a repeated measures ANOVA using the midtest 1 , midtest 2 and posttest as the dependent variables and the pretest as the covariate variable. The between subjects factor was the treatment which had control and experiment.

4.8.1 The Mauchly's Test of Sphericity

To determine whether or not the repeated measures ANOVA's sphericity assumption is true, Mauchly's test of sphericity is used. In the case of sphericity, all combinations of related groups have identical variances in their differences.

The table shows the test which assumes sphericity in the variables

Mauchly's Test of Sphericity[a]							
Measure: MEASURE_1							
Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b]		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
BMI	.967	1.136	2	.567	.968	1.000	.500
Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.							
a. Design: Intercept + Pretest_BMI + Treatment Within Subjects Design: BMI							
b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.							

The findings above indicate that sphericity is assumed as the variances of the differences between all combinations of related groups are equal. This is confirmed by the non-significant p = 0.567>0.05, χ^2=1.136, Ep CI =0.5-1.

4.8.2 The Levene'sTest

The study carried out the Levene's test to test if there was homogeneity of variance in the repeated measures. The table summarises the results of the Levene's test.

Levene's Test of Equality of Error Variances[a]				
	F	df1	df2	Sig.
Midtest1_BMI	4.090	1	36	.051
Midtest2_BMI	.037	1	36	.849
Posttest_BMI	1.285	1	36	.264

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Design: Intercept + Pretest_BMI + Treatment Within Subjects Design: BMI

The data indicates a significant results of p> 0.05 which suggest homogenity of variance. Tests the null hypothesis that the error variance of the dependent variable is equal across groups the results indicate a non-significant p value hence homogeneity.

4.8.3 The Multivariate Test (MANOVA)

The repeated measures multivariate analysis of variance was used to determine if there was any difference in the multiple dependent variables over time and or between treatments where the participants were measured at all-time points. The table below summarises the multivariate results.

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
BMI	Pillai's Trace	.002	.029[b]	2.000	34.000	.972	.002
	Wilks' Lambda	.998	.029[b]	2.000	34.000	.972	.002
	Hotelling's Trace	.002	.029[b]	2.000	34.000	.972	.002
	Roy's Largest Root	.002	.029[b]	2.000	34.000	.972	.002
BMI * Pretest_BMI	Pillai's Trace	.010	.172[b]	2.000	34.000	.843	.010
	Wilks' Lambda	.990	.172[b]	2.000	34.000	.843	.010
	Hotelling's Trace	.010	.172[b]	2.000	34.000	.843	.010
	Roy's Largest Root	.010	.172[b]	2.000	34.000	.843	.010
BMI * Treatment	Pillai's Trace	.511	17.783[b]	2.000	34.000	.000	.511
	Wilks' Lambda	.489	17.783[b]	2.000	34.000	.000	.511
	Hotelling's Trace	1.046	17.783[b]	2.000	34.000	.000	.511
	Roy's Largest Root	1.046	17.783[b]	2.000	34.000	.000	.511

a. Design: Intercept + Pretest_BMI + Treatment

Within Subjects Design: BMI

b. Exact statistic

The four tests used were the Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root indicated that the multivariate tests were not significant. Based on the four test measures used in the multivariate test the study concluded that there is no significant difference in the repeated tests because the p>005 with the exception of the BMI*Treatement. The BMI*Treatment indicated a significant result with a p=0.00<0.05. The partial eta squares indicates a an effect size of 0.511 which means the treatment effect contributed to 51.1% on the BMI of the experiment if the aerobics are consistently carried out over a period of time.

4.8.4 Within Subjects Effects

The data below summarises the within-subjects effects of the participants in the experiment.

Tests of Within-Subjects Effects

Measure: MEASURE_1

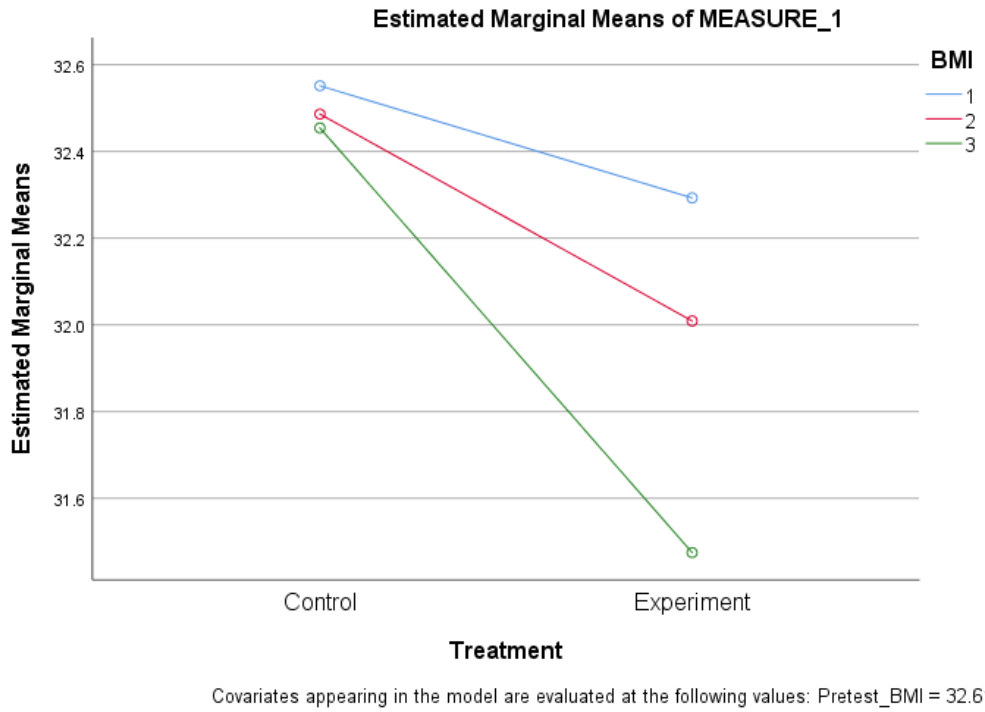
Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
BMI	Sphericity Assumed	.005	2	.002	.030	.970	.001

	Greenhouse-Geisser	.005	1.936	.003	.030	.967	.001
	Huynh-Feldt	.005	2.000	.002	.030	.970	.001
	Lower-bound	.005	1.000	.005	.030	.863	.001
BMI * Pretest_BMI	Sphericity Assumed	.024	2	.012	.148	.862	.004
	Greenhouse-Geisser	.024	1.936	.013	.148	.856	.004
	Huynh-Feldt	.024	2.000	.012	.148	.862	.004
	Lower-bound	.024	1.000	.024	.148	.703	.004
BMI * Treatment	Sphericity Assumed	2.587	2	1.293	15.684	.000	.309
	Greenhouse-Geisser	2.587	1.936	1.336	15.684	.000	.309
	Huynh-Feldt	2.587	2.000	1.293	15.684	.000	.309
	Lower-bound	2.587	1.000	2.587	15.684	.000	.309
Error(BMI)	Sphericity Assumed	5.773	70	.082			
	Greenhouse-Geisser	5.773	67.774	.085			
	Huynh-Feldt	5.773	70.000	.082			
	Lower-bound	5.773	35.000	.165			

The results above indicates that the partial eta squares the data above indicate that there are very marginal changes in the weight loss and BMI of the participants during the 6 week aerobics exercise programme. The BMI test show a non-significant result with a p=0.97 and a PES of 0.01 showing the there was a 1% effect on BMI caused by the 6 weeks aerobics exercise. The treatment factor indicated a significant results of p=0.00<0.05 and a PES of 0.309. This suggests that the treatment could cause a 30% change in the BMI if consistently carried out over time. The data is conclusive of the fact that the six week aerobic programme caused marginal and statistically insignificant change on weight reduction effect on the participants.

4.8.5 Estimated Marginal Means

The estimated changes that forecast the marginal means are insicated in the figure below.



The data in the figure above indicates the widening margins in the means in the three dependent variables. The variables are modelled from the Pretest BMI =32.614 and each line Midtest 1(blue line) , midtest 2(red line) and the Postest (green line) show the increasing marginal means pointing towards the weight loss over a period of time.

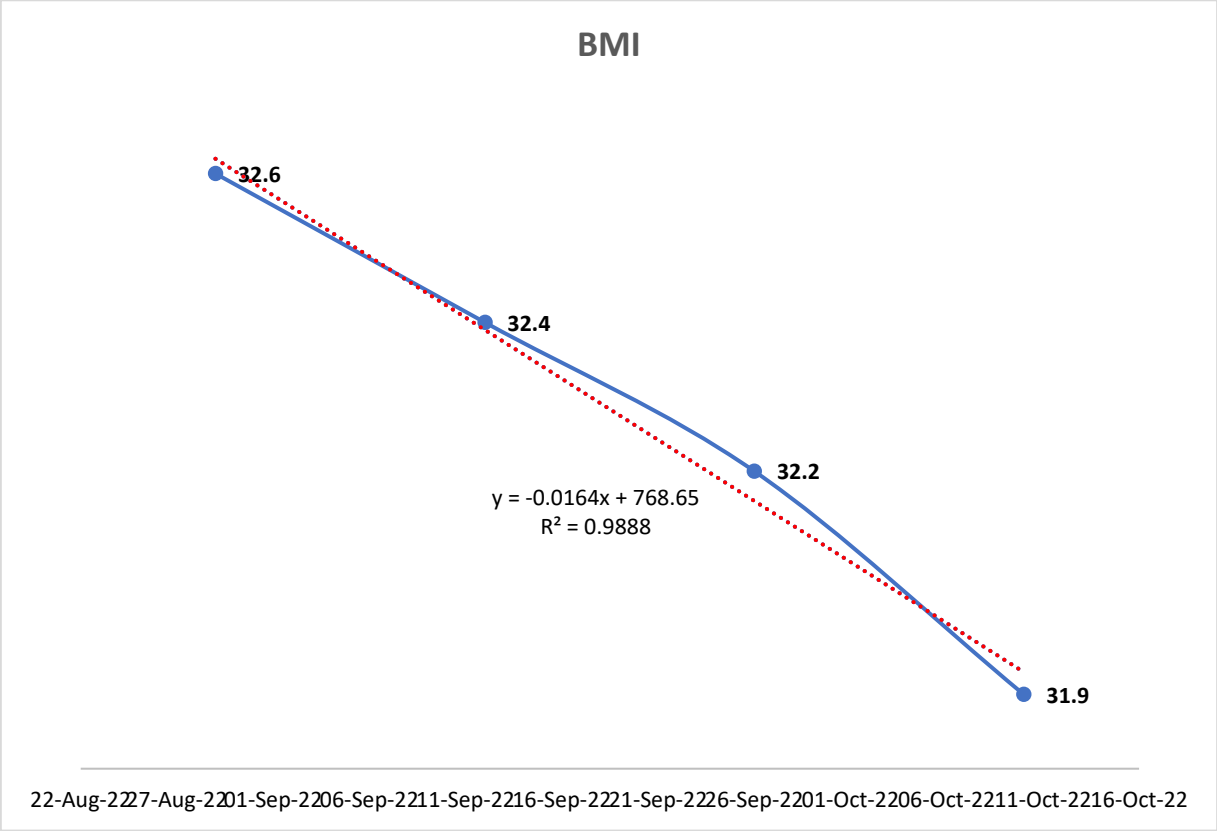
The marginal mean changes therefore predicted a significant effect size which points toward a positive BMI reduction if the aerobics are carried out consistently ceteris paribus. The reduction in the BMI also predicts a reduction in weight, thigh CC and waist circumference.

4.9 Weight Reduction Forecasting

The data collected is limited to 6 weeks aerobic exercises the major factor in weight loss exercises is not just intensity but of time and consistence. The study therefore carried out a forecasting analysis to predict the BMI of the participants in 6 months. The data below summarises the forecasting results.

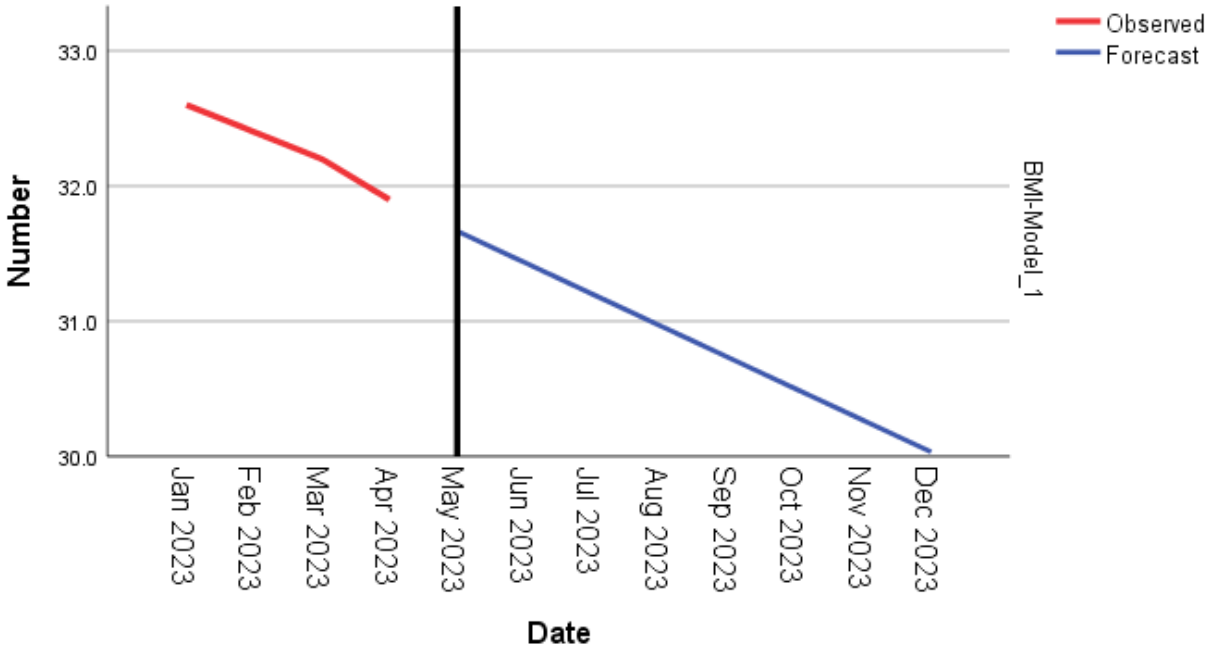
4.9.1 Repeated Measures Trend Plot

The measured mean of BMI from Pretest to Posttest is indicated in the figure below. Included is the regression line with the formula and the R Squared value.



The trend line in the repeated measures is indicative of weight loss and decreasing BMI but the time frame has indicated that the decrease has no effect and is not statistically significant.

Time series Forecast on BMI Reduction



The data in the forecasting above show that there will be a significant weight loss over a period of 12 months if the participants are consistent in the aerobic exercise programme. The time series analysis and forecasting indicates that aerobics are a slow paced mechanism in the weight loss management among obese women.

4.9.3 Exponential Smoothing Forecast

The table below summarises the time series result based on the exponential model of fore casting.

Forecast									
Model		May 2023	Jun 2023	Jul 2023	Aug 2023	Sep 2023	Oct 2023	Nov 2023	Dec 2023
BMI-Model_1	Forecast	31.9	31.9	31.9	31.9	31.9	31.9	31.9	31.9
	UCL	32.7	33.0	33.2	33.4	33.6	33.8	33.9	34.0
	LCL	31.1	30.8	30.6	30.4	30.2	30.0	29.9	29.8
For each model, forecasts start after the last non-missing in the range of the requested estimation period, and end at the last period for which non-missing values of all the predictors are available or at the end date of the requested forecast period, whichever is earlier.									

The data indicates the after twelve months of aerobics exercises the Lower Cut Level will be below 30 kg/m2 in the BMI index. These findings are consistent with the other findings which show that the aerobics exercises used were very slow paced in weight reduction.

4.10 Discussion

According to the study, a six-week aerobic exercise program accompanied by music can somewhat alter the body composition of overweight and obese women. Despite the fact that the difference in thigh size was minor, the results obtained suggest that there are no significant variations in BMI or WHR between the active and inactive groups. Additionally, aerobic exercise for six weeks (three one-hour sessions per week) significantly decreased the BMI, fat mass, and WHR in obese women.

Descriptive statistics from the pre-test, mid-test, and post-test results, such as thigh CC, waist, and BMI, showed a little decrease in the mean weight of the women in the experiment group. The results demonstrate that women remained in the same overweight category after six weeks, and the BMI had a p=0.00 0,05of overweight. The BMI of women has somewhat decreased as a result. To determine the importance and magnitude of the alterations, additional testing was done on the BMI and weight loss. T-test, ANCOVA, and ANOVA were employed in the investigation. These experiments showed that the six-week aerobic exercise program had no appreciable impact on the weight loss of women. For instance, the paired samples t-test results for the thigh CC were as follows: a p =0, 0080,05. This indicates that there was no statistically significant change in the thigh CC of the experiment's female participants.

As revealed by the following statistics: F(2,36)= 0.008, p=0.929, t=0.089, CI=-10.150-9.300, the study demonstrated that there is no statistically significant difference between the control and experimental groups on thigh CC in the post-test. The findings suggests that a six-week aerobic exercise had a negligible impact on participants' BMI, waist circumference, or thigh circumference. In the trial, there was no discernible variation in the data between the various age groups. Given that the same results were seen in both groups, age did not significantly influence the BMI, waist, or thigh CC reduction program. This information is consistent with the evidence described in chapter two, which shows that an effective exercise regimen can significantly affect a person's body weight loss and fat distribution in cases of overweight and obesity. Programs of aerobic exercise can be utilized to modify body composition in overweight and obese females. They also show that losing weight requires more hard, intense training. Programs of aerobic exercise can be utilized to alter the body composition of obese and overweight women. It also suggest that if there is to be a noticeable impact in a short- to medium-term weight-loss program, more intense, demanding exercise is needed. (Panday et al , 2017).

As previously reported in the literature, aerobic exercise raises peak oxygen consumption (VO2 peak), which is directly proportional to the percentage of total body fat. (Sema, 2019)

The data therefore show that aerobic exercise is also a highly effective method for losing weight, particularly body fat, as suggested by Chiu et al. (2017), who claim that aerobic exercise under a trainer's supervision is necessary for people to control, burn fat, and maintain good health. Schwender (2018), on the other hand, found no significant differences in physical characteristics across participants in terms of BMI, waist, and hip size. The current study discovered that this form of exercise reduced BMI by 0, 00%. In the research, this sort of exercise has been documented to have statistically inconsequential impacts on body composition (Hadzovic, 2020) . Hurley (2000) discovered a type of effect of this exercise on body composition that is compatible with the current study.(Schwender 2018) .

The current study discovered that six weeks of aerobic exercise with music had no significant influence on the reduction in women's body composition. This was in line with the findings of Gusvominesia et al (2019). When practiced for a period of more than six weeks, aerobic activities with music have an important function in maintaining BMI. Aerobic exercise can also help you lose thigh fat.

The difference between the current study's findings and the cited ones could be due to the type of exercise and its intensity, the type of music used, the duration of the exercise, and the subjects' fitness levels, among other factors. The following chapter will include a summary, conclusions, and recommendations.

5.0 Conclusion

The study revealed that there was no significant effect on weight loss among obese women participants during the 6-week aerobic exercise. The data analysis shows that the individuals' weight reduction and BMI changed just slightly during the six-week aerobic exercise program. This sort of weight loss strategy, while slow, results in a physically healthy organism for all age groups of women. If done frequently for a long period, low to moderate intensity aerobic dancing activities lower body weight, body mass index, waist hip ratio, thigh size, body fat percentage, and cardiovascular disease. The prognosis indicated that women's aerobics exercises will result in significant weight loss following a twelve-month period of consistency and duration. According to time series analysis and forecasting, aerobics are a slow-paced mechanism in the weight reduction treatment of obese women. According to the data, after twelve months of aerobics exercises, the Lower Cut Level in the BMI index will be less than 30 kg/m2. These findings are consistent with the other data, which suggest that the aerobics routines utilized in weight loss were relatively slow paced.

5.1 Recommendations

The following recommendations were made. It is recommended that:

- Prolonged aerobic dance workouts have been identified as an essential role in influencing body composition in terms of weight loss.
- For aerobic fitness, high-impact aerobic dance must be performed, whereas low-impact aerobic dance must be used for weight loss.
- Aerobic dance exercises must be practiced more frequently and for a longer period of time in order to reduce overweight and obesity in women of various ages.
- More studies must be undertaken to assess their impact on weight reduction in women using other interventions which encompass Cross fit and resistance training methods accompanied with music.

6.0 Declaration

The authors declare that the paper is original and that no funding was provided by any organisation or individual in conducting this study. The study is entirely self- sponsored.

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APPENDICES

PRE-TEST CONTROL GROUP

PRE-TEST CONTROL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.69	80	63.04	93.51		28
P2	1.68	83	67.6	102.2		29.4
P3	1.62	82	65.9	95.2		31.7
P4	1.7	94	67.4	119.98		32.5
P5	1.71	110	77.1	114.9		37.6
P6	1.66	98	75.2	116.5		35.5
P7	1.64	85	64.07	96.54		31.7
P8	1.71	84	69.1	100.01		28.7
P9	1.65	83	68.54	104.14		30.5
P10	1.66	95	70.2	107.1		34.5
P11	1.68	89	77.1	95.45		31.5
P12	1.59	80	69.79	90.98		31.74
P13	1.69	84	74.6	99.8		29.3
P14	1.63	81	65	97.05		30.4
P15	1.75	90	89.1	75.3		29.5
P16	1.69	97	73.6	114.8		33.9
P17	1.6	95	112.9	82.3		37.1
P18	1.69	111	115.8	88.7		38.8
P19	1.62	88	66.04	99.06		33.5

MID-TEST 1 CONTROL GROUP

MID-TEST 1 CONTROL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.69	80	63.04	93.51		28
P2	1.68	83	67.6	102.2		29.4
P3	1.62	81	65.5	95.05		30.9
P4	1.7	94	67.4	119.98		32.5
P5	1.71	110	77.1	114.9		37.6
P6	1.66	98	75.2	116.5		35.5
P7	1.64	85	64.07	96.54		31.7
P8	1.71	84	69.1	100.01		28.7
P9	1.65	84	68.57	104.2		30.8
P10	1.66	95	70.2	107.1		34.5
P11	1.68	89	77.1	95.45		31.5
P12	1.59	80	69.79	90.98		31.74
P13	1.69	84	74.6	99.8		29.3
P14	1.63	81	65	97.05		30.4
P15	1.75	89	89.1	75.3		28.8
P16	1.7	97	73.6	114.8		33.9
P17	1.6	95	112.9	82.3		37.1
P18	1.69	111	115.8	88.7		38.8
P19	1.62	88	66.04	99.06		33.5

MID-TEST 2 CONTROL GROUP

MID-TEST 2 CONTROL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.69	80	63.04	93.51		28
P2	1.68	82	67.2	101.6		29.07
P3	1.62	81	65.5	95.05		30.9
P4	1.7	94	67.4	119.98		32.5
P5	1.71	110	77.1	114.9		37.6
P6	1.66	98	75.2	116.5		35.5
P7	1.64	86	64.07	96.54		31.9
P8	1.71	84	69.1	100.01		28.7
P9	1.65	84	68.57	104.2		30.8
P10	1.66	95	70.2	107.1		34.5
P11	1.68	89	77.1	95.45		31.5
P12	1.59	80	69.79	90.98		31.74
P13	1.69	84	74.6	99.8		29.3
P14	1.63	81	65	97.05		30.4
P15	1.75	89	89.1	75.3		28.8
P16	1.7	95	73.6	114.8		32.8
P17	1.6	95	112.9	82.3		37.1
P18	1.69	111	115.8	88.7		38.8
P19	1.62	88	66.04	99.06		33.5

POST-TEST CONTROL GROUP

POST -TEST CONTROL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.69	80	63.04	93.51		28
P2	1.68	82	67.2	101.6		29.07
P3	1.62	81	65.5	95.05		30.9
P4	1.7	93	67.4	119.98		32.17
P5	1.71	110	77.1	114.9		37.6
P6	1.66	98	75.2	116.5		35.5
P7	1.64	87	64.07	96.54		32.34
P8	1.71	84	69.1	100.01		28.7
P9	1.65	84	68.57	104.2		30.8
P10	1.66	95	70.2	107.1		34.5
P11	1.68	89	77.1	95.45		31.5
P12	1.59	80	69.79	90.98		31.74
P13	1.69	84	74.6	99.8		29.3
P14	1.63	81	65	97.05		30.4
P15	1.75	89	89.1	75.3		28.8
P16	1.7	95	73.6	114.8		32.8
P17	1.6	95	112.9	82.3		37.1
P18	1.69	109	114.6	87		38.11
P19	1.62	88	66.04	99.06		33.5

PRE-TEST EXPERIMENTAL GROUP

PRE-TEST EXPERIMENTAL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.62	82	66.04	96.52		31.3
P2	1.66	84	68.58	104.14		30.5
P3	1.68	81	60.96	93.98		29.7
P4	1.72	92	68.58	121.92		31
P5	1.78	113	76.2	116.84		36
P6	1.76	100	76.2	111.76		32.3
P7	1.61	81	66.04	99.06		31
P8	1.68	82	68.54	99.06		29
P9	1.65	83	68.54	104.14		32
P10	1.61	96	71.12	109.22		37
P11	1.61	83	76.2	93.98		32
P12	1.67	81	71.12	93.98		29
P13	1.66	85	73.66	101.6		30.8
P14	1.62	80	68.58	99.06		30.5
P15	1.71	89	90.17	77.47		30.4
P16	1.7	100	76.2	116.84		35
P17	1.52	100	113.03	85.09		43
P18	1.62	110	114.3	86.36		42
P19	1.7	90	66.04	99.06		31

MID-TEST 1 EXPERIMENTAL GROUP

MID-TEST 1 EXPERIMENTAL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.62	82	66.03	96.51		31.3
P2	1.66	83	68.58	104.13		30.1
P3	1.68	81	60.96	93.98		29
P4	1.72	91	68.58	121.92		30.8
P5	1.78	112	76.2	116.84		35
P6	1.76	100	76.2	111.75		32.3
P7	1.61	81	66.04	99.06		31
P8	1.68	81	68.54	99.05		29
P9	1.65	82	68.54	104.13		29
P10	1.61	96	71.12	109.22		37
P11	1.61	82	76.2	93.97		32
P12	1.67	81	71.12	93.97		29
P13	1.66	84	73.66	101.5		30.5
P14	1.62	80	68.58	99.05		30.5
P15	1.71	89	90.17	77.46		30.4
P16	1.7	100	76.1	116.83		35
P17	1.52	100	113.02	85.09		43
P18	1.62	109	114.2	86.35		41.5
P19	1.7	90	66.02	99.05		31

MID-TEST 2 EXPERIMENTAL GROUP

MID-TEST 2 EXPERIMENTAL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.62	81	66.02	96.5		30.5
P2	1.66	82	68.58	104		29.7
P3	1.68	81	60.95	93.92		29
P4	1.72	90	68.57	121.6		30.5
P5	1.78	111	76.1	116.82		35
P6	1.76	98	76.1	110		31.6
P7	1.61	80	66.02	98		30.9
P8	1.68	80	68.5	99		28.3
P9	1.65	81	68.5	103		30.7
P10	1.61	95	71.12	109		36.6
P11	1.61	81	76	93.5		32
P12	1.67	80	70.6	91		28.7
P13	1.66	83	73.5	100		30.1
P14	1.62	79	68.52	98		30.1
P15	1.71	88	90.1	77.2		30
P16	1.7	99	76	115.5		34
P17	1.52	99	113	84		42.8
P18	1.62	108	114	85.2		41.1
P19	1.7	88	66	98.02		30.4

POST TEST EXPERIMENTAL GROUP

POST TEST EXPERIMENTAL GROUP						
PARTICIPANT	HEIGHT	WEIGHT	THIGH CC	WAIST	AGE	BMI
P1	1.62	80	66.02	96.5		30.5
P2	1.66	81	68.58	104		29.3
P3	1.68	79	60.95	93.92		28.01
P4	1.72	88	68.57	121.6		30.7
P5	1.78	109	76.1	116.82		34.4
P6	1.76	96	76.1	110		31
P7	1.61	79	66.02	98		30.5
P8	1.68	78	68.5	99		27.6
P9	1.65	79	68.5	103		29
P10	1.61	93	71.12	109		36.6
P11	1.61	80	76	93.5		30.8
P12	1.67	80	70.6	91		28.7
P13	1.66	81	73.5	100		29.3
P14	1.62	76	68.52	98		29
P15	1.71	87	90.1	77.2		29.7
P16	1.7	98	76	115.5		33.91
P17	1.52	97	113	84		41.9
P18	1.62	107	114	85.2		40.8
P19	1.7	87	66	98.02		30.1