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Elevated Blood Triglycerides Respond To Brisk Walking And Jogging Exercise After Exercise Counseling: Implication For Practice In Primary Education

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Abstract

The goal of this study was to see how females with high blood triglycerides responded to brisk walking and jogging activities after receiving exercise coaching. Michael Okpara University of Agriculture, Umudike, and Abia State, Nigeria was the focus of this research. The regular non-academic personnel ranged in age from 35 to 60 years old. The study included 67 individuals who responded to a call for a free lipid profile examination. The volunteered workers were given a questionnaire with both inclusion and exclusion criteria, and their replies were compiled. Following that, 54 non-academic employees (15 men and 39 women) met the criteria for inclusion. As a result, the 39 female employees were qualified and sampled for the study based on their gender. The study's 39 female participants were divided into three unequal groups: brisk walking (13 females), jogging (8 females), and control (nine females) (18 females). Data was collected using the Lipid and Risk Identification Questionnaire (LRIQ) and Venous Blood Samples from the individuals for pre and posttest lipid profiles. ANOVA was used to test the hypotheses. The results of this study revealed that following treatment, the female non-academic staff in the brisk walking group lost much more weight than the females in the jogging group. There were substantial variations in the mean loss of female TG between the two treatments groups. A greater dose of BWE and JE of roughly 50–60 minutes per day could result in a considerable reduction in blood triglyceride (TG) levels. It is necessary to establish a university program and calendar that will stimulate and provide opportunities for her employees to engage in active involvement in fitness.

Keywords: lipid profile, triglycerides, counseling, brisk walking, jogging

Introduction

When it comes to cardiovascular risk, triglycerides have received less attention in the past than LDL and HDL cholesterol levels. Recent research suggests that if one's triglyceride levels are higher than average, people should attempt to lower them, especially if you have heart disease or other risk factors like diabetes, high blood pressure, or smoking (Harvard Medical School, 2020). In contemporary society, an increasing number of adults engage in a variety of lifestyle practices that make them more susceptible to heart disease. Diet and exercise are well-known modifiable determinants of the health status of all persons in contemporary culture, including blood lipid profile and cardiovascular disease risk (Odo, & Ogu, 2020). Physical inactivity and abnormalities in blood lipid profiles (triglycerides) are two risk factors harming the health of an increasing number of persons around the world (WHO, 2017).

Triglycerides (TGs) that are too high are linked to an increased risk of cardiovascular disease (Aberra, Peterson, Pagidipati, Mulder, Wojdyla, Philip, Granowitz, & Navar, 2020; Toth, 2016; Miller, et al, 2011; Sarwar, et al, 2007; and American Diabetes Association, 2007). Females with high triglyceride (TG) levels are at a considerably higher risk of coronary artery disease than males, and this risk category (high triglyceride) has been linked to the development of coronary artery disease regardless of the major risk factors (Aberra, et al, 2020). This feature appears to be common in our society, according to Aberra et al., with twice as many cases of coronary artery disease. The World Obesity Federation claimed in 2020 that forced physical inactivity, even for brief periods of time, increases the risk of lipid-related (metabolic) disease, altering an individual's health status.

Although TG is essential for good health, too much of it can be hazardous and increase the risk of heart disease (Szalay, 2016). When people consume more calories than they require, the body stores the excess calories as triglycerides, which can be used for energy later (Wright, 2016; Academy of Nutrition and Dietetics, 2016). Triglycerides (TG) are a type of fat that is more harmful than low-density lipoprotein and thus further increases the human risk of heart disease whenever levels get too high. The cells absorb the triglycerides for energy, leaving the protein and cholesterol behind (Coffman, 2018). Triglyceride levels could be a useful indicator of metabolic health.

TG concentrations less than 150 mg/dL are considered normal, whereas those between 200 and 499 mg/dL are deemed excessive. Furthermore, values of 500 mg/dL or greater are thought to be harmful to the development and progression of a variety of cardiac and vascular disorders (Ginsberg & Goldberg, 2001). Therefore, the triglyceride concentration higher than 150 mg/dL increases a person's risk of CVDs. These individuals need drug therapy and other therapies including exercise that has medicinal values.

Exercise has medicinal value since improving the blood lipid levels is related to reducing body weight and fat, individuals need to choose exercises that will help them lose weight (American College of Sports Medicine, 2021; and Wang, Y., Shen, L., & Xu, D., 2018; and Wang, Y., Shen, L., & Xu, D., 2018). At least 150 minutes of moderate aerobic activity—roughly 30 minutes on most days of the week can help maintain a healthy weigh (Mayo Foundation for Medical Education and Research, 2021). Healthy weigh could be linked to healthy blood

triglyceride levels. High blood triglyceride levels can increase a person's risk of heart disease. The same lifestyle changes that are beneficial to people's general health can also help them lower their triglycerides (Pruthi, 2020). Aerobic activity includes sports like basketball or tennis, cycling, stair climbing, dancing, gardening (including mowing the lawn and raking leaves), jogging, swimming, and walking to the Mayo Foundation for Medical Education and Research (2021).

Though drug therapy remains superior in handling lipid profile abnormalities and their associated comorbidities, the inadequate exercise programs designed and implemented to prevent physical inactivity and other numerous risk factors for lipid profile abnormalities in the community have led to little improvement in the physical fitness and health status of members of our communities. Findings from studies showed that not all the exercises were effective in improving the blood lipid profile. Also, some exercises were more effective than others in improving the blood lipid profile. The link between high blood triglycerides (TG) and brisk walking and jogging exercise was the least well-documented physical activity in Nigeria. Most times poor cholesterol control is the result of ineffective lipid-lowering therapy. For other people, sticking to healthy lifestyle choices like regular physical activity, which can help lower raised blood TG, has proved difficult. Exercise therapy could be a positive adjunctive alternative to these health problems associated to cardiac and elevated lipid profile.

Despite the clear health benefits that can be attained through adopting exercise as a more active lifestyle, most adults in our communities remain underactive. Hence, the need for study that will clearly define the best exercise in the prevention of high blood TG and exercise counseling for health promotion.

A controlled yet consistent exercise program is required to test the response to the two-mode exercise training (brisk walking and running) of university workers with increased triglycerides. The main goal of this study was to see how women with high blood triglycerides responded to two types of exercise training (brisk walking and jogging) after receiving exercise counseling.

Materials and Method

In this interventional study, two research designs—STRRIDE and a randomized parallel design—were used. Studies of a Targeted Risk Reduction Intervention through Defined Exercise (STRRIDE) is an abbreviation that stands for Studies of a Targeted Risk Reduction Intervention through Defined Exercise. STRRIDE is a dose-response study and a randomized controlled experiment for evaluating successful clinical therapies (Bateman et al., 2011). The targeted risk in this study was lipid profile disorder. The defined exercises for risk reduction in this study were brisk walking exercise (BWE) and jogging exercise (JE).

The researchers, through the Medical Center of the Michael Okpara University of Agriculture in Umudike (MOUAU), Abia State, Nigeria, invited the university staff to participate in free lipid profile examinations. The notification was posted on the notice boards of the colleges and staff school of the university. Non-academic workers from MOUAU, who were 35–60 years old volunteered for the study. The study's sample size was 67 people. The volunteered workers

were given a questionnaire with both inclusion and exclusion criteria, and their replies were compiled. Following that, 54 non-academic employees (15 men and 39 women) met the criteria for inclusion. As a result, the 39 female employees were qualified and sampled for the study based on their blood triglycerides levels and gender.

The Infrared Vein Viewer (IVV), Needles and Syringes, and the LipidPlus device were used to collect data in this investigation. In the laboratory, gloves, a white plain tube, cotton wool, methylated alcohol, and a tourniquet were also utilized.

The respondents were also given a Lipid and Risk Identification Questionnaire (LRIQ) to collect demographic information. Age range, employer, kind of employment (teaching or non-teaching employees), and gender were all included in Section A. Section B of the LRIQ included items for inclusion and exclusion criteria, such as age, whether the subject is sedentary (less than 2 times per week for the previous 3 months), whether the subject is on any lipid-lowering drug therapy, whether the subject has a TG level of 150 mg/dl or higher, and whether the subject is a regular staff member of MOUAU.

Patients who had any lipid profile problems related with co-morbidities, had taken any steroid therapy in the last 3 months, had any liver, renal, or heart failure, or were on any sort of anti-lipidemic therapy were all excluded.

STRRIDE was employed in this interventional trial. Studies of a Targeted Risk Reduction Intervention via Defined Exercise (STRRIDE) is an abbreviation that stands for Studies of a Targeted Risk Reduction Intervention via Defined Exercise. The therapies given to the participants with lipid profile problems were two types of exercise: brisk walking and running. As a result, this study used a randomized parallel design to investigate the effects of various exercise regimens on blood TG levels.

During the pretest and post-test, two trained chemical pathologists and medical laboratory scientists performed the lipid profile test (screening). To reduce measurement error, all of the subjects were screened by the same examiners. After an overnight fast of roughly 12 hours, blood samples were taken from each individual under stringent aseptic conditions. After extracting the blood sample, the serum was separated by centrifugation for 10 minutes. A blood analyzer was used to assess and calculate blood lipid concentration and lipid profile-triglycerides (TG). Chemical testing kits were employed as needed. The following are the intervention groups: Groups 1 and 2 are for brisk walking and jogging, respectively.

Prior to the start of the 12-week exercise program, the subjects received exercise counseling services. They were well informed about the hazards of physical inactivity as well as the therapeutic value of exercise. It was correctly conveyed to them how to assure injury-free workout participation. The participants were psychologically motivated to complete the workout program.

Each of the intervention groups (brisk walking and jogging) received training from a research assistant (fitness trainer). All subjects in both the brisk walking and jogging groups were instructed to exercise three times per week in the exercise prescription for the intervention groups.

Each training session lasted 50 minutes, including 5 minutes of warm-up, 40 minutes of nonstop brisk walking and running, and 5 minutes of cool-down.

The mode of activity was aerobic exercise, which included brisk walking and jogging. The Brisk Walking Exercise consists of a self-paced stroll or sluggish walking on the feet. A self-paced jog and a trot are included in the jogging exercise. The two intervention groups went through a 12-week training program (3 months). Every week, there were three sessions (Mondays, Wednesdays, and Fridays). Every training session took place in the evening (5–6 p.m.) and was divided into three parts: a general warm-up, a conditioning bout, and a cool-down.

The intensity of the activities in this study was monitored using a Talk test. Despite a minor increase in heart rate and respiration, the participants were able to sing while walking and running at a moderate pace.

The Michael Okpara University of Agriculture (MOUAU) Demonstration Secondary School football field was used for the brisk walking and jogging training programs. The subjects in the control group were told to go about their daily lives as usual. The three groups were compared in terms of triglyceride (TG) changes: the brisk walking group, the jogging group, and the control group. A test was performed to see if there were any differences in the mean TG levels in the three groups. ANOVA was used to test the hypotheses.

Results

Table 1: Mean Triglyceride (TG) Response to Two Modes of Exercise in Females (Pre-test and Post-test).

Variables	Walking Group (N=13)					Jogging Group (N=8)					Control(N=18)				
	Pre-test		Post-test		$(\bar{x})$	Pre-test		Post-test		$(\bar{x})$	Pre-test		Post-test		$(\bar{x})$
	$(\bar{x})$	SD	$(\bar{x})$	SD	loss	$(\bar{x})$	SD	$(\bar{x})$	SD	loss	$(\bar{x})$	SD	$(\bar{x})$	SD	loss
TG	124.62	22.18	97.20	20.68	27.42	127.88	16.73	118.38	18.11	9.5	132.33	9.65	131.78	10.28	0.55

Females in the control group had the greatest mean score of 0.55, followed by the jogging group with a mean loss of 9.5, and the brisk walking group with a mean loss of 27.42, as shown in Table 1. The table revealed that the control group's female non-academic staff had the highest post-mean TG score, followed by the jogging group. The ladies in the control group, on the other hand, experienced the least amount of TG loss. After the treatment, the female non-academic staff in the brisk walking group had the greatest mean loss, followed by the males in the jogging group.

Table 2: Test for Mean Differences in Female Non-Academic Staff TG Levels in the Three Groups

		Sum of Squares	Df	Mean Square	F	Sig.
PostTG	Between Groups	2954.911	2	1477.456	5.549	.008
	Within Groups	9586.063	36	266.280		
	Total	12540.974	38			

As indicated in Table 2, ANOVA demonstrated a significant main impact on the postTG of female university workers in all three groups: F (2,38) = 5.549, p.05. As a result, the hypothesis that there is no significant difference in postTG between male and female university employees was rejected.

Table 3: The results of the Bonferroni Multiple Comparisons Test on the mean differences in female TG between the three groups.

(I) groups	(J) groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
walking exercise	jogging exercise	-5.75962	7.33267	1.000	-24.1722	12.6530
	Control	-19.16239*	5.93939	.008	-34.0764	-4.2483
jogging exercise	walking exercise	5.75962	7.33267	1.000	-12.6530	24.1722
	Control	-13.40278	6.93385	.183	-30.8139	4.0084
Control	walking exercise	19.16239*	5.93939	.008	4.2483	34.0764
	jogging exercise	13.40278	6.93385	.183	-4.0084	30.8139

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*. At the 0.05 level, the mean difference is significant.

Using the Bonferroni post hoc test, it was discovered that variations in female workers' TG were only seen in the walking and control groups.

Discussion

Females with high blood triglycerides were given two modes of exercise training (brisk walking and jogging) after exercise counseling in an attempt to respond to the two-mode exercise training (brisk walking and jogging). The female non-academic staff in the BWE group had the highest mean drop in blood TG level than the JE group after the 12-week exercise training program, according to the study's findings. Female non-academic personnel in the brisk walking group had significantly higher mean loss after treatment than females in the jogging group. There were

substantial variations in the mean loss of female TG between the two treatments groups. The above findings provided answer to the following research question "What is the mean difference in the Triglyceride (TG) level of female non-academic staff who exercised in brisk walking or jogging and those in the control group?

This suggests that BW exercise was more effective than JE in lowering female blood TG levels. Also, among university employees, BWE and JE could be accepted as an effective supplemental cholesterol management medication. Monazamnezhad, Habibi, Shakeriyan, Majdinasab, and Ghalvand (2015); Monazamnezhad, Habibi, Shakeriyan, Majdinasab, and Ghalvand (2015). Nineteen middle-aged overweight or obese Korean women underwent either the brisk walking program (9 women) or the brisk walking plus diet program (10 women) for twelve weeks, according to Lee and Kim (2006). The brisk walking comprised of 20 to 50 minutes of walking per day. The results showed that following the brisk walking program, triglycerides (TG) dropped significantly ($Z = -2.31$, $p = 0.021$; $Z = -2.59$, $p = 0.009$). The TG and Apo B reducing effects of the brisk walking program were not statistically different from those of the brisk walking plus diet program ($U = 37.0$, $p = 0.549$; $U = 42.0$, $p = 0.842$). In the conclusion of their study, brisk walking can be an effective intervention for overweight or obese middle-aged women with triglyceride disorder.

Twenty-eight volunteer women with multiple sclerosis, ranging in age from 20 to 45 years, took part in this semi-experimental study by Monazamnezhad et al. (2015). The individuals were randomly assigned to one of two groups: exercise ($n = 15$) or control ($n = 13$). Before and after the intervention, a lipid profile and body composition data were determined.

For 8 weeks, 3 sessions per week, the exercise group did aerobic training and a 6-minute walk test (6 MWT) separately at 50 percent –70 percent heart rate reserve (HRR). Significant reductions in TG (triglyceride), TC (total cholesterol), LDL (low density lipoprotein), and PBF (percent body fat) were found in the exercise group at the end of the 8-week period. At the end of the study, there was a substantial difference in TG, LDL levels, and PBF between the two groups. In the control group, there was no significant difference in the studied parameters between the initial and final measurements. The current study's findings, as well as those of Monazamnezhad, et al. (2015), support the favorable impact of regular aerobic exercise training on lipid profile modifications in females with TG disease.

Other studies have found that exercise time, exercise volume, and exercise intensity affect blood lipid profile-induced changes in blood lipids. It is required to raise the aerobic activity intensity in order to reduce TG levels even more (Lamina & Okoye, 2012; Bemelmans, Blommaert, Wassink, Coll, Spiering, Graaf, & Visseren, 2012; Mawi, 2009). However, among those with coronary artery disease who have restricted exercise capacity or other risk factors, this is difficult to attain.

Conclusion

BWE and JE were found to be effective treatments for decreasing TG levels in female blood. For persons with high blood TG levels, brisk walking exercise (BWE) and jogging workouts (JE) can

be prescribed with no negative side effects. BWE and JE of moderate intensity are more effective in lowering the risk of TG levels and lipid diseases than diet and physical inactivity. A greater dose of BWE and JE of roughly 50–60 minutes per day could result in a considerable reduction in blood triglyceride (TG) levels. Prolonged physical inactivity induces an increase in the blood TG level. For individuals' healthy lipid profile and healthy heart, BWE would be an ideal exercise for the larger populations seeking to control their lipid profile level. Depletion of blood TG through BWE and JE suggests impaired development of comorbidity conditions associated with the disorders in this lipid profile parameter in the participants. More female blood TG was burned and depleted with BWE than JE. BWE increases the rate of digestion of blood TG in females more than JE.

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