

Impact of 12 Weeks of Resistance Band Exercise on Blood Glucose Level Among Middle-Aged Women

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Abstract

The aim of this study was to find out the impact of 12 weeks of resistance band exercise on blood glucose level among middle aged women. Forty middle aged women ($n = 40$) were randomly selected as subjects and their age ranged between 40 and 55 years. The selected subjects were randomly assigned into two equal groups such as experimental group (EG) and control group (CG) with twenty subjects each ($n = 20$). The experimental groups underwent their respective resistance band exercise for twelve weeks three days per week and a session on each day. Control group was not exposed to any specific training apart from their activities. Fasting blood sugar level was taken as variable for this investigation and it was measured in milligrams per deciliter (mg/dL) by enzymatic glucose oxidase preoxidase (GOD-POD) method using Boehringer Mannheim kit. Analysis of covariance (ANCOVA) was used to analyze the collected data. The results revealed that the experimental group (EG) produced significant reduction ($p \leq 0.05$ & 0.01) on blood glucose level due to resistance band exercise when compared to control group (CG). Resistance band exercise is one of the best methods to improve the glucose level in blood among middle aged women.

Keywords: Resistance band exercise, blood glucose, diabetes, middle aged women.

INTRODUCTION

Resistance bands are big elastic or cloth bands used for strength training and improving balance, flexibility and mobility in all areas of the frame. They can help construct muscle, enhance bodily characteristic and strengthen bones while not having to use heavy weights or signing up to a steeply-priced gym membership. Resistance band exercises can also enhance your stability, reducing the risk of falls and injury, and making regular sports, like carrying something heavy or climbing stairs, simpler (www.bhf.org.uk/information-support). Nowadays, obesity, mainly belly obesity, in addition to boom in frame fat layers is taken into consideration as one of the predominant troubles globally. A huge variety of behavioral, genetic, biological, and environmental factors can lead to obesity (Sturm, 2005). Obesity is strongly related to chronic cardiovascular problems and type 2 diabetes mellitus at some stage in the middle-age and the vintage age (Galic et al., 2010). Resistance exercises is a workout programme whether or not free or desk bound weights are used for the cause of increasing muscular electricity, muscular staying power and electricity thru which skills may be progressed (Moran & McGlynn, 1997).

The resistance is a try to result in edition in anxiety established neural mechanisms that inhibit the excitation of motor neurons in voluntary maximal contradictions. Resistance education refers to strength training performed by and large to decorate someone's look, symmetry, energy and wellbeing (Bean, 1997). It's miles an anaerobic shape of workout (Teng et al., 2008). It's miles caused to beautify the capability of the body to carry out at very high pressure or electricity for a completely brief time frame

(Baechle, 1994). At the same time as the literature supports the performance of resistance training or three instances in step with week (Ramsay et al., 1990). 12 weeks of regular resistance band training substantially lowers fasting blood glucose, reduces insulin resistance, and improves HbA1c stages in middle-aged girls, mainly people with kind 2 diabetes or metabolic syndrome. This education method complements glucose uptake by muscle tissues, appearing as a powerful, reachable, and plausible home-based totally intervention to improve glycemic manage.

Glucose is the number one source of energy for the frame's cells, and blood lipids (within the shape of fats and oils) are normally a compact energy store (Hayashi et al., 1997). Glucose is transported from the intestines or liver to body cells through the bloodstream, and is made to be had for cellular absorption thru the hormone insulin, produced through the body mostly in the pancreas. Its size is essential to the prognosis of diabetes mellitus. The high supply of strength human cells is glucose that's a sort of sugar which passes thru the blood system. While eat carbohydrates, glucose is going thru body. The tiers of glucose are kept regular by way of glucagon and insulin. Insulin is the hormone which is generated inside the pancreas and discharged into the blood system whilst levels of glucose upward thrust. Resistance schooling facilitates to enhance the extent of insulin generation (Miller et al., 1994 & Henriksson, 1995). Currently, it become determined that the adipose tissue is an energetic endocrine tissue which secretes a large quantity of active intermediates which include adipokine, which plays an extensive role in energy homeostasis, similarly to, regulating the blood glucose and fat metabolisms ((Rabe et al., 2008). The "fasting blood glucose" check ought to have the man or woman fasting for at least eight - 12 hours. Regular levels for this test are 70 to one hundred mg/dl ranges of blood sugar always better than 150 mg/dl are a signal of high blood sugar also called hyperglycemia. While the blood sugar degree consistently falls to 70 are lower this is a signal of low blood sugar additionally recognise as hypoglycemia. Continual hyperglycemia causes diabetes mellitus that is the most frequent disease connected to the law of blood sugar. Diabetes is a ailment that may reason kidney, nerve and eye harm. Bodily exercise allows manipulating blood sugar level and keeping fitness (WHO, 2008 & Craig et al., 1989). Health club schooling is facilitates to normalize the level of blood sugar (Jason et al., 2008). The objective of this have a look at become to find out the effect of 12 weeks of resistance band exercise on blood glucose level amongst middle aged women.

MATERIALS AND METHODS

The purpose of this study was to find out the impact of 12 weeks of resistance band exercise on blood glucose level among middle aged women. Forty middle aged women (n = 40) were randomly selected as subjects and their age ranged between 40 and 55 years. The subjects were selected from the Ernakulum city who were coming for regular walking, Kerala, India. The selected subjects were randomly divided into two equal groups of twenty subjects each (n = 20). The groups were one experimental group (EG) and one control (CG). During the training period, the experimental groups underwent their respective training programme for twelve weeks 3 days per week and a session on each day apart from their curriculum. Control group (CG), who did not participate in any specific training. Moderate intensity (60-70%) of resistance was used in this experimentation. Fasting blood sugar was selected as dependent variable for this study. It was measured in milligrams per deciliter (mg/dL) by enzymatic glucose oxidase preoxidase (GOD-POD) method using Boehringer Mannheim kit. These are the exercise used as a resistance, pull apart, lat pull down, dumb waiter, lateral raise, chest press, bicep curl, triceps extension, leg press, leg abduction (standing and seated), and Squat (standing and seated). Mean and standard deviation were calculated for fasting blood sugar for training group and control group. And the data were analyzed by using analysis of covariance (ANCOVA). Statistical significance was set to priority at 0.01 and 0.05.

RESULTS

Table - I Analysis of Covariance on Fasting Blood Sugar of Experimental Group and the Control Group

Test		EG	CG	SOV	SS	df	MS	F
Pretest	Mean	109.45	105.83	B W	16.92	1	18.38	1.58

	SD	5.27	4.92		1236.7	38	33.71	
Post test	Mean	93.28	106.72	B W	629.28	1	594.02	10.29*
	SD	5.92	5.19		1206.92	38	30.16	
Adjusted Post test	Mean	93.02	106.33	B W	702.71	1	617.27	14.61*
					962.28	37	29.62	

$F = (df\ 1, 38) (0.05) = 4.10$ & $(0.01) = 7.35$; $(p \leq 0.05)$ & $(p \leq 0.01)$, $F = (df\ 1, 37) (0.05) = 4.11$ & $(0.01) = 7.37$; $(p \leq 0.05)$ & $(p \leq 0.01)$.

Table I shows that the pre test mean of experimental and control groups are 109.45 and 105.83 respectively. The obtained F ratio of 1.58 for pretest mean is less than the table value 4.10 for df 1 and 38 required for significance at 0.05 level and table value 7.35 for df 1 and 38 required for significant at 0.01 level. The post tests mean of experimental and control groups are 93.28 and 106.72 respectively. The obtained F ratio of 10.29 for posttest mean is higher than the table value 4.10 for df 1 and 38 required for significance at 0.05 and also higher than the table value 7.35 for df 1 and 38 required for significant at 0.01 level. The adjusted post test mean of experimental and control groups are 93.02 and 106.33 respectively. The obtained F ratio of 14.61 for adjusted posttest mean is higher than the required table value 4.11 for df 1 and 37 required for significant at 0.05 and 7.37 for 0.01 level.

The result of the study indicated that there was a significant reduction between the posttest and adjusted posttests mean of resistance band training group and control group on fasting blood sugar at 0.05 and 0.01 levels. The pre, post and adjusted post test mean values of experimental group and control group on fasting blood sugar levels are graphically represented in the figures 1 & 2.

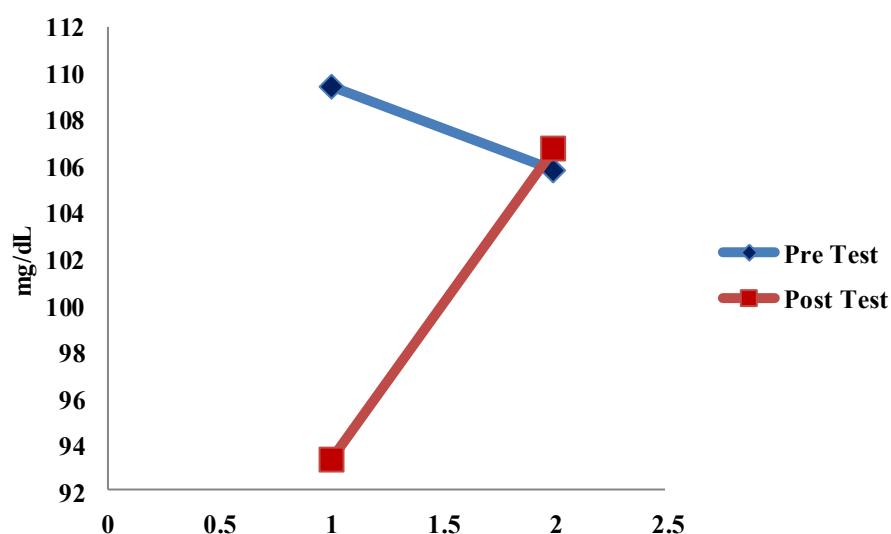


Figure 1: The pre and posttest mean values of experimental group and control group on Fasting Blood Sugar

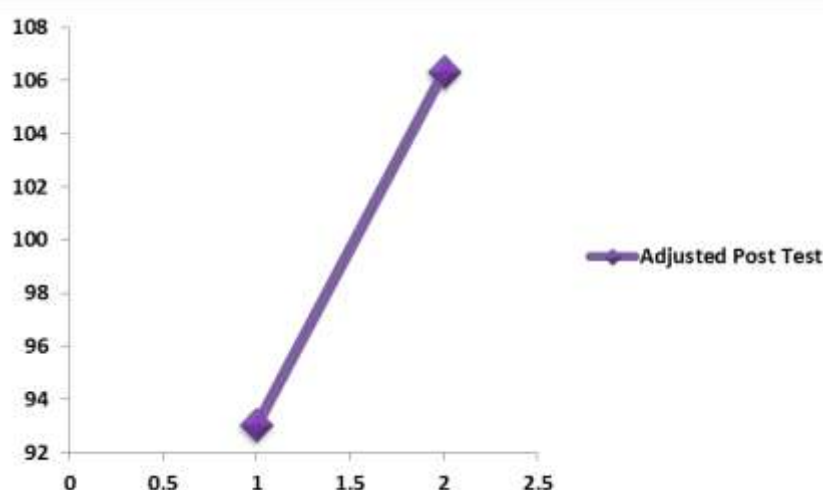


Figure 2: The adjusted posttest mean values of experimental group and control group on Fasting Blood Sugar

DISCUSSION

The present study revealed that there was a significant reduction on blood glucose level due to 12 weeks of resistance band exercise. The twelve weeks of resistance exercising has been shown to boom insulin sensitivity, decrease glucose intolerance (Sundell, 2011 & Neil et al., 2006). Jorge et al (2011) also said comparable findings; it is consequently, diabetic patients who did resistance skilled a boom in insulin receptor substrate expression. The study of Varghese & Abraham (2012) and Asaithambi et al (2012) clearly proved that the resistance training is the best method to improve the blood glucose level and it is very useful for the entire diabetic patients as well. High blood glucose and excessive insulin tiers can also have a deleterious impact on hypertension and blood lipids (Hurley, 1994). Mark et al., (2009) pronounced that electricity training considerably reduced basal insulin degrees and area below the insulin reaction curve following glucose ingestion.

The lower in insulin was drastically correlated with increase in lean body mass. Hurley et al. (1988) said that insulin response to an oral glucose tolerance check changed into extensively lower following 16 weeks of resistance training. Rajaram, & Abraham (2011) proved that the serum lipid was influenced by the systematic training. Enhancements in glucose metabolism with energy training, impartial of changes in cardio capacity or percentage body fats, have been shown (Hurley et al., 1988). Interestingly, Smutok et al. (1993) and Irvin & Taylor (2009) concluded that strength training and cardio schooling improved glucose tolerance and decreased insulin responses to oral glucose further. Some other studies are also associated with the result of this investigation, Joseph et al (2024), Sakeer et al (2014) and Abraham & Cherian (2014) found out that the systematic physical training very much influences the blood glucose level positively. Miller et al (1984), Anson et al (2008) and John & Abraham (2017) point out that the resistance training differentially affects weight loss and glucose metabolism.

In addition, physical sports have been advised to play a role in controlling the omentin-1 stage. For example, Saremi et al. investigated the effects of 12 weeks of aerobic workout on 18 overweight men. The consequences confirmed a decrease in insulin resistance (Saremi et al., 2010). AminiLari et al (2017) and Raut et al (2024) absolutely explained that the resistance training is one of the nice strategies to improve the insulin sensitivity amongst middle aged women and they found out this training can assist to reduce the blood glucose stage as nicely.

CONCLUSION

Resistance band physical activities were proven to be beneficial in enhancing many factors associated with right fitness. these factors include extended function and prevention of falls, decreased pain in continual low again ache sufferers, advanced glucose tolerance and insulin sensitivity, multiplied BMD, increased basal metabolic fee (weight manage), and improved first-rate of existence. It's far concluded that the fasting blood sugar degree may be reduced for the duration of the age between 40 and 55 years of women and favour the prescription of moderate intensity resistance band training during the initial adaptation duration.

The look at provided on this review demonstrates that there was a significant distinction on blood sugar because of slight resistance band schooling as compared to manipulate group. In conclusion, 12 weeks of resistance band exercising programme in middle aged women precipitated considerable upgrades in blood glucose level.

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Conflict of Interest

The authors declare no conflict of interest.

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