



RESEARCH ARTICLE

INFLUENCE OF YOGIC PRACTICE AND PHYSICAL EXERCISES ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE AMONG WOMEN PATIENTS WITH NIDDM

^{*}¹Uma, N. and ²Dr. S. Indira

¹Director of Physical Education from Pachiyappa's College for Women, Kanchipuram

²Director of Physical Education from JBAS College for Women, Teynampet, Chennai

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ABSTRACT

The aim of this study was to find out the effect of yogic practices and physical exercises on systolic and diastolic blood pressure among women patients with NIDDM. Sixty women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centres in Chennai were randomly selected as subjects in the age group of 35 to 45 and divided into control group, experimental group I, which underwent physical exercises, experimental group II which underwent yogic practices and control group did not underwent any special treatment / training. Pre and post experimental scores on systolic and diastolic blood pressure were statistically analysed using ANCOVA. The results proved that experimental treatments significantly contributed to beneficially alter systolic blood pressure (F : 36.36) and diastolic blood pressure (F: 69.44). The adjusted mean comparisons through post hoc analysis of results proved that physical exercises and yogic practices significantly altered systolic blood pressure compared to control group (P <0.05). Yogic practices non significantly altered systolic blood pressure than physical exercises. As for diastolic blood pressure it was found that both physical exercises and yogic practices significantly regularized compared to control group (P<0.05). The results further proved that yogic practices were significantly better than physical exercises in beneficially alter diastolic blood pressure. Thus, it was concluded that yogic practices play significant role in regularizing systolic and diastolic blood pressure and can be popularized among diabetic patients for effect of use in treating and managing diabetics especially among women diabetic patients.

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INTRODUCTION

Diabetes has become the leading cause of end-stage renal disease and of adult blindness. Neurological complications, including peripheral neuropathy and autonomic insufficiency, are other microvascular problems that afflict patients with diabetes. People with diabetes are two to four times more likely than nondiabetic individuals to experience cardiovascular complications. The scale of the diabetes epidemic is increasing, primarily because of the rising occurrence of obesity in the developed, as well as the developing, world. Moreover, the incidence of diabetes increases with age, and most populations worldwide are growing older. Harris *et al.* (1998) Weight loss and physical activity are the most effective means of improving insulin sensitivity in patients with type 2 diabetes. In fact, a prospective, randomized trial has shown that diet-related weight loss and physical exercise can each reduce the

incidence of diabetes onset in patients with impaired glucose tolerance. Knowler *et al.* (2002) These behavioral approaches to preventing the onset of diabetes or to improving insulin sensitivity in established diabetes are difficult to implement and sustain. Diminished exercise capacity, as assessed by peak oxygen consumption (peak VO₂), was independently associated with an increased incidence of diabetic nephropathy and retinopathy in patients with diabetes without a history of coronary artery disease. Estacio *et al.* (1998) The incidence of hypertension is very high among patients with type 2 diabetes mellitus; the condition is present in approximately 40% of patients at diagnosis, increasing to 80–90% when diabetic nephropathy develops. Randomized Appropriate Blood Pressure Control in Diabetes (ABCD) clinical trial was undertaken with hypothesis that blood pressure control would prevent or slow the progression of diabetic nephropathy, neuropathy, retinopathy and cardiovascular events and emphasized the importance of aggressive blood pressure control, in both hypertensive and normotensive patients, as one effective means of lessening the burden of complications caused by type 2 diabetes mellitus.

**Corresponding author: Uma, N.*

Director of Physical Education from Pachiyappa's College for Women, Kanchipuram

Thent *et al.* (2013) documented that exercise training programs have emerged as a useful therapeutic regimen for the management of type 2 diabetes mellitus (T2DM). Researches were undertaken to find out which of the different forms of physical activities are beneficial to control NIDDM. Hegde *et al.* (2013) studied the effectiveness of yoga intervention on oxidative stress, glycemic status, blood pressure and anthropometry in prediabetes and found Yoga is beneficial in reduction in BMI, waist circumference, systolic blood pressure and fasting glucose. Aswathy *et al.* (2013) documented that the prevalence of Diabetes is projected to increase to 80 million by 2030, placing an immense burden on the health care resources of our country. Thus, diabetes poses a challenge to health systems and the individual. Hence, it is necessary to look at adjuncts to effective management of Diabetes; adjuncts which are not resource intensive and are nearer to the community that people live in. Yoga holds promise as a therapeutic intervention and health promotion measure. This brief communication explores the studies done to date on the beneficial effects of Yoga on Diabetes. Sanghani *et al.* (2013) assessed the effect of structured exercise training and unstructured physical activity interventions on glycemic control and found structured exercise training was beneficial than unstructured physical activity. Thus, the theoretical foundations laid proved that yogic practices and physical activities can beneficially contribute in managing NIDDM. However, there was further scope for research to find out which of the two, whether yogic practices or physical activities is more efficient to control NIDDM, especially among women. Hence, this research was undertaken.

MATERIALS AND METHODS

Sixty women NIDDM patients undergoing treatment in Government Hospitals and Diabetic Centres in Chennai were randomly selected as subjects in the age group of 35 to 45. They were grouped into three based on their mean random blood sugar level, such as control group, experimental group I and experimental group II respectively. Pre tests scores were obtained on their systolic and diastolic blood pressure. Experimental group I underwent 12 weeks yogic practices, experimental group II underwent 12 weeks physical exercises and control group did not participated in any of the special activity. Immediately after completion of the experimental period, the post tests were conducted on the above said dependent variables, which formed final scores of the subjects. The difference between initial and final scores was considered as the effect of respective treatment. To test statistical significance, ANCOVA was used. In all cases 0.05 level was fixed to test the hypothesis of this study.

RESULTS

The collected data were analysed to find out the effect of yogic practices and physical exercises on blood pressure, such as systolic and diastolic separately among NIDDM women patients. The obtained results are presented in Table I. Due to experimental treatments, the blood pressure was stabilized and the systolic blood pressure was reduced 6.75 in physical exercise group and 8.50 in yogic practices group while there

Table 1. Effect of Yogic Practices and Physical Exercises on Systolic and Diastolic Blood Pressure among NIDDM Women Patients

Tests	MEANS OF			Source of Variance	Sum of Squares	df	Mean Squares	Obtained F
	PE Group	YP Group	Control Group					
RESULTS ON SYSTOLIC BLOOD PRESSURE								
Pre Test	143.75	144.75	145.50	Between	30.83	2	15.42	0.14
				Within	6162.50	57	108.11	
Post Test	137.00	136.25	147.25	Between	1510.83	2	755.42	10.94*
				Within	3937.50	57	69.08	
Adjusted Post Test	137.63	136.19	146.67	Between	1287.62	2	643.81	36.26*
				Within	994.38	56	17.76	
Mean Diff	6.75	8.50	1.75					
RESULTS ON DIASTOLIC BLOOD PRESSURE								
Pre Test	93.00	92.00	93.25	Between	17.50	2	8.75	0.25
				Within	2003.75	57	35.15	
Post Test	88.00	83.50	95.25	Between	1405.83	2	702.92	34.88*
				Within	1148.75	57	20.15	
Adjusted Post Test	87.86	83.93	94.97	Between	1243.99	2	622.00	69.44*
				Within	501.59	56	8.96	
Mean Diff	5.00	8.50	2.00					

PE: Physical Exercises YP: Yogic Practices

Table F-ratio at 0.05 level of confidence for 2 and 57 (df)=3.16, 2 and 56 (df)=3.16.

*Significant

Table 2. Multiple Comparisons of Adjusted Paired Means among Physical Exercises Group, Yogic Practices Group and Control Group on Systolic and Diastolic Blood Pressure

Variables	MEANS OF			MD	C.I Reqd
	PE Group	YP Group	Control Group		
Systolic Blood Pressure	137.63	136.19		1.44	3.35
	137.63		146.67	9.04*	3.35
		136.19	146.67	10.48*	3.35
Diastolic Blood Pressure	87.86	83.93		3.93*	2.38
	87.86		94.97	7.11*	2.38
		83.93	94.97	11.04*	2.38

PE: Physical Exercise; YP : Yogic Practices

* Significant

was a slight increase of 1.75 in control group. Similarly, there was a decrease in diastolic blood pressure to the extent of 5.00 among physical exercises group and 8.5 among yogic practices group and an increase of 2.00 among control group. To test which of the two experimental group was significantly better than the other post hoc analysis was made to compare the paired adjusted means and the results presented in Table II.

DISCUSSION

Forty percent of all diabetic admissions to hospitals in India are due to lack of exercises. Researches showed that physical exercises has been shown to reduce cholesterol levels, have a protective effect from coronary heart disease, reduce body weight, reduce blood pressure and improve circulation in medical patients. Physical exercises after eating have been beneficial in keeping post prandial blood sugars in control for many patients. Many diabetic patients have reduced their medication levels during their tenure in their walking programme. (Girish and Sridhar, 2007) The effect of physical exercises and yogic practices among diabetics women patients were studied in this article. The results proved that experimental treatments significantly contributed to beneficially alter systolic blood pressure (F : 36.36) and diastolic blood pressure (F: 69.44). The adjusted mean comparisons through post hoc analysis of results proved that physical exercises and yogic practices significantly altered systolic blood pressure compared to control group (P <0.05). Yogic practices non significantly altered systolic blood pressure than physical exercises. As for diastolic blood pressure it was found that both physical exercises and yogic practices significantly regularized compared to control group (P<0.05). The results further proved that yogic practices was significantly better than physical exercises in beneficially alter diastolic blood pressure. The findings were in agreement with the findings of Thent *et al.* (2013) who found exercise training programs have emerged as a useful therapeutic regimen for the

management of type 2 diabetes mellitus (T2DM); Hegde *et al.* (2013) who found yoga Yoga is beneficial in reduction in BMI, waist circumference, systolic blood pressure and fasting glucose. Thus, it was concluded that yogic practices play significant role in regularizing systolic and diastolic blood pressure and can be popularized among diabetic patients for effect of use in treating and managing diabetics especially among women diabetic patients.

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