

IMPACT OF YOGA THERAPY ON 6 MINUTE WALK TEST AMONG MIDDLE AGED MEN DIAGNOSED WITH ASYMPTOMATIC VARICOSE VEINS RANDOMIZED CONTROLLED TRAIL

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Abstract:

Varicose veins (VV) are veins that are unusually large, convoluted, and conspicuous due to a lack of venous valves, resulting in venous congestion and high venous pressure. The primary objective is to determine whether yoga therapy will optimize pain and swelling in the leg in men who are diagnosed with varicose veins. Impact of yoga therapy on prolonged standing jobs diagnosed with varicose veins is a randomized, parallel group, active controlled trail. According to the National Clinical Guideline Centre and CEAP (Clinical, Etiological, Anatomical and Pathophysiological) Classification of lower limb varicose veins (2004): skin with varicose vein visible (C2) are selected for the study. The subjects will be middle aged men. The total number of sample size is determined to be 60. Based on the information obtained, subjects were divided into two groups: yoga therapy group (30) and control group (30). The Dependent variables are 6 minute-walk test (6MWT). Subjects had received yoga therapy for 3 months, three days per week with the session lasting for 60 minutes of total 12 weeks duration and the participants were taken from Chennai district only. In the Control Group, they will engage in active rest. The results proved that Yoga therapy intensify the Distance in 6 minute-walk test (6MWT). It is concluded that yoga therapy is beneficial to middle aged varicose veins men.

Keywords: Yoga therapy, 6minute-walk test (6MWT), Middle aged men, Varicose Veins.

INTRODUCTION

Lower-limb varicose veins (VVs) are frequent, and they are more common in those who work in vocations that require extended standing [1]. Varicose veins (VV) are veins that are unusually large, convoluted, and conspicuous due to a lack of venous valves, resulting in venous congestion and high venous pressure. Prolonged standing at work has been identified as a major risk factor for varicose veins [2]. Chronic venous diseases (CVD) are conditions that arise as a result of venous hypertension induced by valve insufficiency and/or venous flow restriction, and in which venous system function is reduced [3]. Yoga and Ayurveda are old Indian traditional systems. Yoga adheres to Ayurvedic teachings. Vagbhata describes the symptoms of "varicose veins" induced by vata, which develop as a result of Vata dosha activation. Treatment for varicose veins can be found in ancient Indian books such as Astanga Hrdaya and Charaka Samhitha [4]. Yoga for varicose veins is a methodical technique to comprehensive physical, mental, and emotional relaxation. Yoga for varicose veins can help restore vein suppleness, strengthen leg muscles, and enhance the muscular force required to pump blood towards the heart. Standing while working is often the most appropriate working posture. However, there are a number of serious considerations regarding employees' health and comfort [5].

INCLUSION CRITERIA

Willingness to participate in the study and signing in the written consent form, those diagnosed with varicose veins based on CEAP classification, symptoms C2, Middle aged men with Asymptomatic Varicose Veins, No history of practicing yoga or other exercises, Assessed suitable for practicing yoga therapy.

EXCLUSION CRITERIA

Active clinical surgery or other major clinically Significant disorder/ disease, Blood clotting disorders, Patients on anti-coagulant drugs, Person suffering with other co morbidities.

MATERIAL AND METHODS

Volunteers among the subjects, diagnosed with varicose veins are collected for the study after applying for ethical to the Meenakshi Academy of Higher Education and Research, Chennai. The impact of yoga therapy among middle aged men diagnosed with asymptomatic varicose veins was a randomized, active-controlled, parallel-group trail. According to the National Center for Clinical Guidelines and his CEAP (Clinical, Etiological, Anatomical, and Pathophysiological) Classification of Varicose Veins (2004): Skin with visible varicose veins (C2) is selected for study. The target audience is middle-aged men. All subjects will be informed of the purpose and nature of the study and will obtain written consent prior to data collection. The total number of samples is set to 60. Based on the

information received, subjects were divided into two groups. Yoga Therapy group (30 sample) and a Control group (30 sample). The dependent variable is the 6-minute walking test (6MWT). Pretest and posttest were performed for all outcome measures for all selected samples. Subjects were trained in yoga therapy three days a week for three months, with sessions lasting 60 minutes in Chennai city only. The control group were in active rest. A paired t test was used to examine the data within groups to compare the parameters between study and non-study groups by using SPSS v.26.

SIX-MINUTE WALK TEST

The 6MWT was performed to assess the submaximal exercise capacity of individuals. The 6MWT was applied to all subjects by the same physiopedia following standard instruction of the test. The object of this test is to walk as far as possible for 6 minutes. The following instructions were given to subjects before starting of the test that the subject have to walk for six minutes long and subject can probably get out of breath or become exhausted the subject are permitted to slow down or to rest as necessary. The 6MWT distance was measured by using a stopwatch, 30 meter stretch of

unimpeded walkway. Two cones to make the distance needs to be covered. Also, Heart rate has been measured during the walk [6].

INTERVENTION

For three months, the control group they were in active rest (AR), while the experimental group underwent yoga therapy (YT). The techniques administrated for YT group as part of Yoga were Sukshma-Vyayama (Subtle joint loosening), Asanas (yogic-postures), Pranayama (voluntarily regulated breathing practices), Deep-relaxation techniques (DRT), OM-Dhyana (Meditation). The details about the above-mentioned practices and the duration are given below. For three months, a qualified therapist gave the YT treatments to the experimental group for sixty-minutes three days a week. Both groups were also instructed to continue their interventions on regular basis mentioned in methodology and also as per the provided directions or instructions, and regular phone follow-up was done on time. During the trial, no injury or unfavorable impact of the procedure were observed.

RESULTS AND OBSERVATIONS:

CONSORT FLOW DIAGRAM

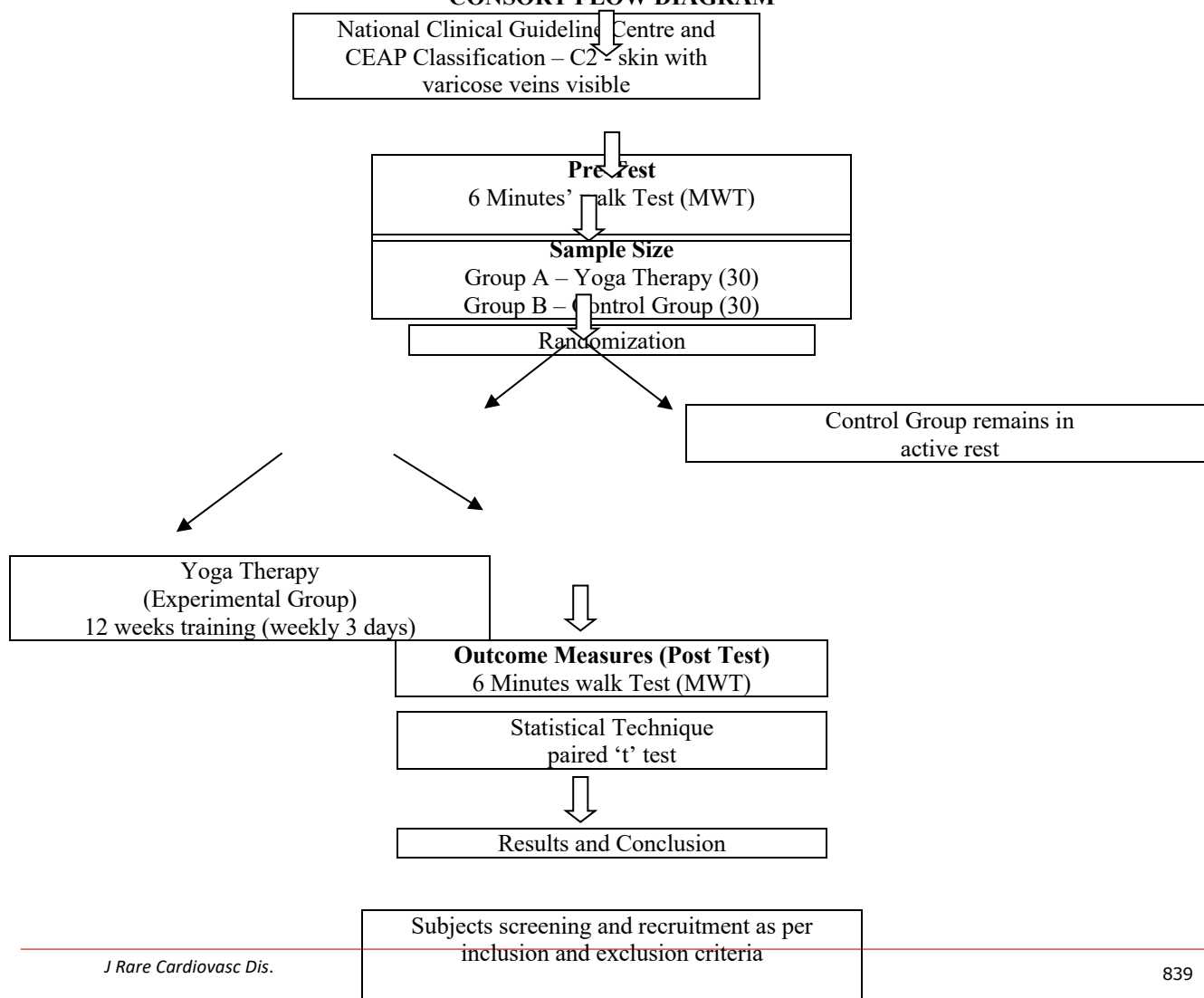


TABLE 1

The detail of practices introduces for both Experimental and Active control groups.

Groups	List of the Practices	Frequency	Duration
Experimental Group	Yoga Therapy Practices		
	1. Sukshma-Vyayama (subtle joint loosening practices) Baddhakonasana (full butterfly pose), Gulf-Chakra (ankle-rotations), Gulf-Goornan (ankle-rotations), Gulf-naman (ankle stretch), Janu-chakra (knee-crank), Janunaaman (knee-bending), Manibandhashaktivikasikaa (wrist-loosening exercises), Padangulinaaman (toes-stretch), Skandha-chakra (shoulder rotation)	3 days a week	10 min.
	2. Asanas (YP) Chakra-padasana (leg-rotation), Dhanuarsana (bow-pose), Jatharaparivartasana, Makarasana, Pada-sanchalanasana (cycling), Parsvakonasana, Paschimottanansna (forward-stretch), Salabhasana (locust-pose, Sarvangasana (shoulder-stand pose), Setubandhasana (bridge-pose), Trikonasana, Upavistkonasana, Utthanapadasana (raised-leg pose), Viparitararani (inverted-pose)	3 days a week	20 min.
	3. Pranayama (voluntarily-regulated breathing techniques) Kaplabhati (frontal-brain cleansing), Nadisuddhi (alternate-nostril breathing), Shitali, Sheetkaari.		10 min.
	4. Deep-Relaxation technique 5. OM-Dhyana (OM-Meditation) Total Duration	3 days a week 3 days a week	10 min. 10 min. 60 min/day
Control Group	Control Group (They were in Active Rest)		

RESULTS AND DISCUSSIONS

- The data pertaining to the variable collected from the two groups before and after the training period were statistically analyzed by using paired 't' test to determine the significant difference and the hypothesis was tested at 0.05 level of confidence.
- These are shown in the Tables below.

TABLE: 2

EFFECTIVENESS OF YOGA THERAPY ON WALKTEST_6MINT AMONG MIDDLE AGED MEN BETWEEN YOGA AND CONTROL GROUP

Group	Effect Score of Walktest 6mint		
	Mean	SD	Paired t test and p value
Yoga Group	83.83	9.08	t=50.567 p=0.000 ***
Control group	0.78	2.00	t=2.147 p= 0.040 *
Independent t value and p value	t = 48.924, p= 0.000 ***		

Note: *** - p<0.001 Level of Significant, N.S – Not Significant

The above table shows the results of "t" test of intervention groups for 6 minute walk test among middle aged men diagnosed with varicose veins. In the case of Pretest and Post test (Experimental Group), pre-test of yoga therapy group and control group shows no statically significant difference among them whereas post-test of yoga therapy group shows statically significant than the post test of control group. The post-test of yoga therapy group has improved than the control group. Hence, it is concluded that, there is a significant large difference between the Pre-test and Post-test for 6 minute walk test among experimental group.

TABLE 3

DESCRIPTIVE STATISTICS FOR STUDY VARIABLES AMONG MIDDLE AGED MEN IN PRETEST FOR YOGA AND CONTROL GROUP

Study variables	Yoga (n=30)		Control (n=30)		t test value and p value
	Mean	SD	Mean	SD	
Physical Variables					
walktest_6mint_pre	230.28	19.38	231.00	13.29	t = 0.171 p=0.865 (N.S)

Note: *** - p<0.001 Level of Significant, N.S – Not Significant

TABLE 4

DESCRIPTIVE STATISTICS FOR STUDY VARIABLES AMONG MIDDLE AGED MEN IN POSTTEST FOR YOGA AND CONTROL GROUP

Study variables	Yoga (n=30)		Control (n=30)		t test value and p value
	Mean	SD	Mean	SD	
Physiological Variables					
walktest_6mint_pre	314.10	17.86	231.78	13.61	t = 20.080 p=0.000 ***

Note: *** - p<0.001 Level of Significant, N.S. – Not Significant

The effectiveness of the yoga therapy on 6 minute walk test between yoga therapy group (M=83.83, SD=9.08) and the control group (M=0.78, SD=2.00) shows that the t-value for yoga therapy group is 50.567, p value p=0.000*** and for control group t value is 2.147, p value is 0.040*. This show that here is a significant difference. Hence, it is proved that yoga therapy group improve the walking pattern and distance among middle aged men diagnosed with varicose veins.

TABLE: 5 (DEMOGRAPHIC VARIABLES)

Characteristics	Number	Percentage
Age Group (years)		
31-35	9	15
36-40	15	25
41-45	24	40
46 and above	12	20
Marital Status		
Un Married	3	5
Married	57	95
Occupational Status		
Un Skilled ¹	19	31.6
Semi- Skilled ²	24	40
Skilled ³	17	28.3
Distended Superficial Veins		
Left Leg DSV	33	55
Right Leg DSV	27	45

¹Unskilled occupations include physical labor & watchman

²Semi-Skilled occupations include of hotel workers & Sales Persons

³Skilled occupations were Advocate & Teachers

TABLE: 6 ASSOCIATION BETWEEN WALK-TEST 6 MINUTES IN PRE-TEST AND DEMOGRAPHIC VARIABLES AMONG MIDDLE AGED MENFOR YOGA THERAPY GROUP

Demographic variables	Walk-test 6 minutes (n = 30)			
	n	Mean	SD	F and t test value and p value
1. Age in Years				
a.31 to 35	6	245.42	12.18	F = 5.836 p = 0.003 **
b.36 to 40	6	243.08	21.28	
c.41 to 45	11	224.96	12.29	
d.45 and above	7	214.64	18.22	
2. Educational Qualification				
a.SSLC	10	233.35	20.39	F = 1.367 p = 0.272 (N.S)
b.HSC	12	223.38	20.10	
c.Degree Holder	8	236.75	15.58	
3. Occupational Status	10			
a. Unskilled Occupation	12	233.35	20.39	F = 1.367 p = 0.272 (N.S)
b. SemiSkilled Occupation	8	223.38	20.10	
c. Skilled Occupation"		236.75	15.58	
4. Marital status				
a. Unmarried	2	247.50	26.68	t = 1.318 p = 0.198 (N.S)
b. Married	28	229.36	18.79	
5.Distended Superficial Veins				
a. Left Leg	18	224.03	17.72	t = 2.317 p = 0.028*
b. Right Leg	12	239.63	18.59	
6. Religion				
a.Hindu	27	229.07	18.46	t = 1.012 p = 0.320 (N.S)
b. Muslim	3	241.00	28.65	

TABLE: 7 ASSOCIATION BETWEEN WALK-TEST 6 MINUTES IN POST-TEST AND DEMOGRAPHIC VARIABLES AMONG MIDDLE AGED MEN FOR YOGA THERAPY GROUP

Demographic variables	Walk-test 6 minutes (n = 30)			
	n	Mean	SD	F and t test value and p value
1. Age in Years				
a.31 to 35	6	333.25	16.22	F = 10.549 p = 0.000***
b.36 to 40	6	325.92	15.93	
c.41 to 45	11	305.86	9.85	
d.45 and above	7	300.50	10.14	
2. Educational Qualification				
a. SSLC	10	319.45	21.84	F = 1.405 p = 0.263 (N.S)
b.HSC	12	307.58	16.42	
c.Degree Holder	8	317.19	12.65	
3. Occupational Status				
a. Unskilled Occupation	10	319.45	21.84	F = 1.405 p = 0.263 (N.S)
b. SemiSkilled Occupation	12	307.58	16.42	
c. Skilled Occupation"	8	317.19	12.65	
4. Marital status				
a. Unmarried	2	329.25	30.05	t = 1.254 p = 0.220 (N.S)
b. Married	28	313.02	17.06	
5. Distended Superficial Veins				
a. Left Leg	18	309.53	16.48	t = 1.780 p = 0.086 (N.S)
b. Right Leg	12	320.96	18.32	
6. Religion				
a. Hindu	27	313.32	17.41	t = 0.716 p = 0.480 (N.S)
b. Muslim	3	321.17	24.51	

DISCUSSION

Lower-limb VVs refers to a condition characterized by visible, tortuous VVs in the lower limbs resulting from intravenous blood reflux, in turn due to vein wall dilation and valvular incompetence of superficial veins. Prolonged standing at work has been shown to be associated with a number of potentially serious health outcomes, such as lower back and leg pain, cardiovascular problems, fatigue, discomfort and prolonged standing in the work place leads to a number of negative health outcomes [7]. According to the CEAP classification, walking distances were less in the 6MWT in patients in the C2 class. In fact, the above results show the improvement in the walking pattern 6MWT for the experimental group. The exercise capacity decreases in patients with varicose veins [3]. A previous study conducted with yoga therapy with walk test showed a significant results on post intervention, the experimental group exhibited a significant increase in 6minute walk test distance compared to the control ($p<0.05$), supporting the hypothesis that YT benefits VV patients in maintaining proper walking patterns [8]. Hence, the Yoga therapy will play a great role in the physical exercise for the improvement in varicose veins subjects. The comparison of the physical activity scores and 6MWT distance and distance percentage values of the CEAP C2 (varicose veins) classes of the study group is presented in Table 3. There was a statistically significant difference between the two groups in terms of the 6MWT distance and distance percentage values ($p<0.05$). The 6MWT distance values of the C2 (varicose veins) class were significantly higher yoga therapy group ($M=83.83$, $SD=9.08$) and the control group ($M=0.78$, $SD=2.00$). The table 5 and 6 (pre and post) in distended superficial veins pre shows that in left leg ($n=18$, $M=224.03$) and in right leg ($n=12$, $M=239.63$) also in posttest show that left leg ($n=18$, $M=309.53$) and in right leg ($n=12$, $M=320.96$) these values show that as a physiology of the human body the right leg will have more power than the left also in post shows the same significant difference. The distended superficial veins are that the veins are visible through our eyes which is procured out of the veins in legs. As in pre and post test of the right leg also improved than the pre test among subjects diagnosed with VV.

CONCLUSION

It was concluded that there will be significant differences on 6minute walk test distance was (Increased) among experimental group I compared to control group due to hatha yoga practices among middle aged men diagnosed with varicose veins. Hence, Yoga therapy is good for varicose veins men to maintain walking pattern in daily life. The study suggests that standing or walking at work should be limited and alternate with other positions such as sitting, preferably with the legs in an elevated position.

DECLARATIONS

Ethical Considerations

We complied with ethical standards. The trial has been reviewed and approved by the institutional ethics committee (IEC) of Meenakshi Academy of Higher Education and Research (Deemed to be University) in the committee meeting held on 20th February 2022. The institutional ethics committee clearance certificate reference number is MMCH/RI/PhD/01/JAN/23. The trial has been registered in the Clinical Trials Registry-India (CTRI). The registration number for the trial is CTRI/2023/05/052928.

Consent to publish

All authors agreed to the content of the final paper.

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Competing Interest

No potential conflict of interest was reported by the authors.

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