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## Effect of brisk walking and yogic practices on flexibility and blood pressure

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### Abstract

The purpose of the present study was to find the effect of brisk walking and yoga practice on flexibility and blood pressure. For this purpose, forty five women living in and around Kannur town, Kerala State in the age group of 35 – 40 years were selected. They were divided into three equal groups (n = 15), each group consisted of fifteen subjects, in which group – I underwent brisk walking, group – II underwent yoga practice and group – III acted as control group who did not participate in any special training. The training period for this study was five days in a week for twelve weeks. Prior to and after the training period the subjects were tested for flexibility, systolic blood pressure and diastolic blood pressure. Flexibility was measured by administering sit and reach test and blood pressure was assessed by using sphygmomanometer respectively. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in the present study, Scheffé S test was used as pos-hoc test. It was concluded from the result of the study that the brisk walking and yoga practice has positively altered the criterion variables, such as, flexibility and blood pressure when compared with the control group. But there was no significant difference was found between the training groups.

**Keywords:** brisk walking, yoga practice, flexibility, systolic blood pressure, diastolic blood pressure

### Introduction

This reality of pure Consciousness has been recognized by all thinkers, spiritualists or materialists, as the fundamental axiom of life from which intelligence, volition, love and thought emanate <sup>[1]</sup>. It is a science that affects not only the aware oneself but the subliminal as well. It is a practical physiological training, can praise man to the 'supra mundane level'. [2] Patanjali introduced yoga and its principles were first written down in India several thousand years ago <sup>[3]</sup>.

According to Swami Vishnu Devananda <sup>[4]</sup> "Yoga is not an ancient myth buried in oblivion. It is the most valuable inheritance of the present. It is the essential need of today and the culture of tomorrow". Yogsanas have a deeper considerable value in the development of the physical, mental and spiritual personality. But pure physical exercises only have effect on the muscles and bones. Aerobic means "with oxygen", and refers to the use of oxygen in the body's metabolic or energy-generating process <sup>[5]</sup>. Walking is good for the muscles because all the muscles in our body contract at the time of walking <sup>[10]</sup>. Walking programs is being popular as recreational activity, that are characterized by moderate levels of intensity have been shown the most effective interventions when used to promote physical activity and adherence to exercise <sup>[11]</sup>. Regular walking of a moderate to vigorous intensity has been shown to benefit both cardiovascular and psychological health <sup>[12]</sup>.

### Methods

This study under investigation involves the experimentation of brisk walking and yoga practice on flexibility, systolic blood pressure and diastolic blood pressure. Only women those who were residing in around Kannur town, Kerala State and aged between 35 and 40 years were selected. The selected forty-five subjects were randomly divided into three groups of fifteen each, out of which group - I (n = 15) underwent brisk walking, group - II (n = 15) underwent yoga practice and group - III (n = 15) remained as control. The training programme was carried out for five days per week during morning session only (6 am to 8 am) for twelve

weeks. Flexibility was measured by administering sit and reach test, systolic blood pressure and diastolic blood pressure was assessed by using sphygmomanometer. Before applying the experiment all the subjects of the brisk walking, yoga practice and control groups were attended the pre-test, which was conducted a day prior to the commencement of the training and the data were collected on flexibility, systolic blood pressure and diastolic blood pressure. After twelve weeks of training the post-test was conducted one day after the training period to find out any changes in the criterion variables.

The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental

groups and control group on selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there was three groups were involved in this study, the Scheffé *S* test was used as pos-hoc test and it was shown in Table - II.

### Analysis of Data

The data collected prior to and after the experimental periods on flexibility, systolic and diastolic blood pressure on brisk walking group, yoga practice group and control group were analysed and presented in the following table - I.

**Table I:** Analysis of Covariance and 'F' ratio for Flexibility, Systolic Blood Pressure and Diastolic Blood Pressure for Brisk walking Group, Yoga Practice Group and Control Groups

Variable Name	Group Name	Brisk Walking Group	Yoga Practice Group	Control Group	'F' Ratio
Flexibility (in inches)	Pre-test Mean $\pm$ S.D	5.87 $\pm$ 0.31	5.41 $\pm$ 0.13	5.59 $\pm$ 0.28	0.997
	Post-test Mean $\pm$ S.D.	6.99 $\pm$ 0.17	7.32 $\pm$ 0.218	5.27 $\pm$ 0.212	14.99*
	Adj. Post-test Mean	6.839	7.587	5.414	86.33*
Systolic blood pressure (in mmHg)	Pre-test Mean $\pm$ S.D	135.01 $\pm$ 2.27	137.81 $\pm$ 2.86	135.59 $\pm$ 1.97	0.97
	Post-test Mean $\pm$ S.D.	132.67 $\pm$ 3.18	129.34 $\pm$ 2.41	136.16 $\pm$ 2.26	18.39*
	Adj. Post-test Mean	131.934	130.378	135.882	55.39*
Diastolic blood pressure (in mmHg)	Pre-test Mean $\pm$ S.D	86.59 $\pm$ 2.44	87.86 $\pm$ 3.72	86.39 $\pm$ 2.55	0.89
	Post-test Mean $\pm$ S.D.	84.73 $\pm$ 3.45	83.31 $\pm$ 2.86	87.19 $\pm$ 1.59	35.88*
	Adj. Post-test Mean	84.131	83.215	86.837	69.53*

\* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 43 and 2 and 42 were 3.21 and 3.22 respectively).

Table - I shows that pre test means 'f' ratio of brisk walking group, yoga practice group and control group on flexibility were 0.997, which were insignificant at 0.05 level of confidence. The post and adjusted post test means 'f' ratio value of experimental groups and control group was 14.99 and 86.33, which was significant at 0.05 level of confidence. The pre test means 'f' ratio of brisk walking group, yoga practice group and control group on systolic blood pressure were 0.97, which were insignificant at 0.05 level of confidence. The post and adjusted post-test mean 'f' ratio value of experimental group and control group was 18.39 and

55.39, which was significant at 0.05 level of confidence. The pre test means 'f' ratio of brisk walking group, yoga practice group and control group on diastolic blood pressure were 0.89 which was insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 35.88 and 69.53, which was significant at 0.05 level of confidence. Further which of the paired Further to determine which of the paired means has a significant difference among the group, the Scheffé *S* test was applied.

**Table II:** Scheffé S Test for the Difference Between the Adjusted Post-Test Mean of Flexibility, Systolic Blood Pressure and Diastolic Blood Pressure

Adjusted Post-test Mean Difference on Flexibility (in inches)				
Brisk Walking Group	Yoga Practice Group	Control Group	Mean Difference	CI
6.839		5.414	1.425*	0.513
6.839	7.587		0.748*	0.513
	7.587	5.414	2.173*	0.513
Adjusted Post-test Mean Difference on Systolic Blood Pressure (in mmHg)				
131.934		135.882	3.948*	1.16
131.934	130.378		1.556*	1.16
	130.378	135.882	5.504*	1.16
Adjusted Post-test Mean Difference on Diastolic Blood Pressure (in mmHg)				
84.131		86.837	2.706*	0.355
84.131	83.215		0.916*	0.355
	83.215	86.837	3.622*	0.355

\* Significant at 0.05 level of confidence.

### Results

Table - II shows that the Scheffé *S* Test for the difference between adjusted post-test mean on flexibility of brisk walking group and control group (1.425) and yoga practice group and control group (2.173), which were significant at .05 level of confidence. There was a significant difference on systolic blood pressure between brisk walking group and control group (3.948), brisk walking group and yoga practice group (1.556) and yoga practice group and control group

(5.504). There was also a significant difference found on diastolic blood pressure between brisk walking group and control group (2.706), brisk walking group and yoga practice group (0.916), and yoga practice group and control group (3.622) which was significant at 0.05 level of confidence after the respective training programme. Moreover the result of the study shows that there was no significant difference between the training groups on selected criterion variables.

## Conclusions

Flexibility was improved due to the yoga practice periods.<sup>[8, 13]</sup> Flexibility was also improved after the brisk walking.<sup>[16]</sup> Systolic and diastolic blood pressure decreased for brisk walking group<sup>[7, 9, 18]</sup>, and yoga practice group<sup>[6, 14, 15]</sup> has also decreased for both the experimental groups, such as yoga practice group and brisk walking group, when compared with the control group. Murphy *et al* (2007)<sup>[17]</sup> found that brisk walk helps to improve the  $VO_{2max}$  and an decrease in body weight, BMI, % of body fat and resting diastolic blood pressure. The overall study indicates that the brisk walking and yoga practices are better tools to improve the physical fitness as well as physiological variables.

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