

EFFECT OF YOGIC EXERCISES ON FORCED VITAL CAPACITY OF MALE SOCCER PLAYERS

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ABSTRACT:

Present study was designed to explore the effect of 12-week yogic exercise on Forced Vital Capacity (FVC) of male soccer players. Thirty (N=30) interuniversity male soccer players whose age ranged from 20 to 25 years were purposively selected from an Interuniversity training camp held at Punjabi University Patiala. All subjects were healthy having no physical or any other ailment. The selected subjects were then randomly divided into two equal groups of fifteen subjects in each. Group I was treated as experimental group (n=15) practiced yogic exercises for twelve weeks along with their routine training and group II served as the control group (n=15) and participated in their routine physical training for interuniversity camp and they were not allowed to participate in any yogic exercises during the training protocol. Respiratory variable FVC was selected as a dependent variable for the study. All the subjects were tested at baseline and after the twelve weeks training period for selected physiological variable. Random group pre-test and post-test design was used as an experimental design. Then the collected data was statistically analyzed by using paired 't'-test and ANCOVA. The findings of the study demonstrate a significant ($p < 0.05$) difference in adjusted post-test mean scores of experimental and control groups for FVC. It concludes that twelve weeks yogic exercises are effective to improve FVC of male soccer players in addition to their physical training.

KEYWORDS: Forced Vital Capacity, Yogic exercises, Soccer.

INTRODUCTION:

“Yoga is a method by which the restless mind is calmed, and the energy is directed into constructive channels” (Iyengar, 1989). Yoga is an ancient physical and spiritual discipline; it is also a branch of philosophy that originated in India some close to the end of what we know as the pre-historic era. Yoga involves the physical and mental practices that have been canonized in a variety of different forms and different ways throughout the world. (Yoga Ayush Ministry, n.d.). When we approach the term yoga etymologically, we get to its *Sanskritic* root ‘*yuj*’ as well as the Latin root ‘*jungo*’ which refers to the action of binding, joining, attaching, yoking or uniting (Singh & Das, 2019). Yoga has picked up hugely in ubiquity amid the most recent couple of years and today more than 30 million individuals practice yoga on a regular basis. Due to the dynamic nature of yogic practices, today it has become a vital part of many sporting endeavors. Athletes, coaches and trainers use yogic exercises for warm up and cooling down and do yogic exercises for getting betterment in their

performance at play fields. Nowadays, success in professional sports is influenced by insights from various disciplines. Besides a good physique, professional training includes technical and tactical preparation focusing on physical fitness and physiological profile of athletes (Singh & Das, 2019). A lot of existing literature in the field report that yogic training has significant effects on the physical and physiological profile that can improve the performance capability of a wide range of athletes across various sports disciplines (Vanderburg, 2017; Roberts, 2004). In sports world, soccer is one of the most famous, unique, oldest and beautiful game being played by every nation without exception and with maximum number of fans (Chattopadhyay, 2018). The soccer is an intermittent type multi-sprint sport involves both types of energy systems. It is characterized by repeated bouts of short duration high intensity sprints in an endurance context that requires the maintenance of skills throughout the match (Mohr, Krstrup, & Bangsbo, 2003). On average football players are likely to cover around 10-12 kms distance during a match, at an average intensity of 75-80% of maximal oxygen uptake (VO_2 max.). Throughout the 90 minutes of the game, player cruises for 30-90 seconds and sprinting for 3-5 seconds (POWERbreathe International, 2021). However, many studies indicate a linear relationship between performance in the game of soccer and respiratory parameters. Due to the intermittent nature of the game, the main emphasis of the training is given on the development of respiratory system parameters, specially FVC, i.e. one of the best indicators of aerobic fitness. FVC is the amount of air forcefully expired by an individual, after a maximum inhalation. Spirometer is the instrument used to measure the forced vital capacity. FVC of untrained individual is ranged from 4 - 4.5 L whereas in case of trained athletes it is 5 - 6 L. Aerobic exercises have the capacity to increase the forced vital capacity and it is also one of the most important factors which influence the intensity of the exercise. FVC has a significant relationship with the anaerobic and aerobic endurance and considered as one of the most important components of endurance performance (Katch, McAdrdle & Katch, 2020). There are numbers of studies available to access the effect of different exercises and training protocols on FVC, but present study is designed in a way that it scrutinizes the additional effect of yogic exercises on FVC of male soccer players over and above the normal physical training.

METHODOLOGY:

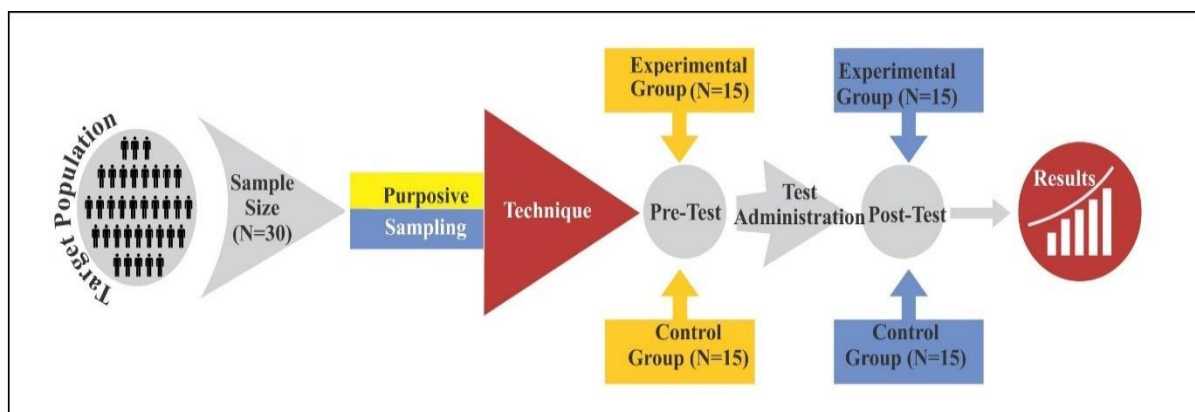
To accomplish this study, thirty (N=30) male soccer players aged between 20 and 25 years (mean \pm SD: age 21.5 ± 1.0 years; height 175.66 ± 5.16 cm; weight 65.8 ± 6.27

kg) were selected. These subjects were part of the interuniversity training camp 2017-18 held at Punjabi University, Patiala. Initially, a chronological list of participants was created, and they were randomly assigned to two groups based on even and odd serial numbers. Group 1, the experimental group, consisted of fifteen (n=15) participants (mean ± SD: age 21.46 ± 1.09 years; height 177.13 ± 5.37 cm; weight 67 ± 7.10 kg). Group 2, the control group, also had fifteen (n=15) participants (mean ± SD: age 21.54 ± 1.08 years; height 174.2 ± 4.67 cm; weight 64.6 ± 5.28 kg).

Table 1 Experimental Design for the Study

Group	Pre- test	Treatment	Post- test
Experimental Group	X	12 Weeks Yogic Exercises	X
Control Group	X	No Treatment	X

Figure 1 Experimental Design for the Study



Both groups underwent similar training for their interuniversity camp under the same environmental conditions. In addition to their regular physical training, the experimental group engaged in a specific set of yogic exercises for 12 weeks, conducted six days a week, excluding Sundays, totaling 72 days, at the Sports Hall in Punjabi University, Patiala. The dependent variables selected for this study FVC was measured with the help of digital spirometer available at Department of Physical Education, Punjabi University, Patiala. All subjects were tested at baseline (pre-test) and after twelve weeks of yogic exercises for post-test. Data was collected between 08:00 am and 09:00 am after their morning fitness training session. The collected data was statistically analyzed using SPSS version 23.0. Paired t-tests and ANCOVA were used to compare the pre-test, post-test, and

adjusted post-test mean scores of the experimental and control groups at 0.05 level of significance for FVC.

TRAINING PROTOCOL:

The subjects in the experimental group participated in a yogic exercise training program six days a week, excluding Sundays, for twelve weeks. During this period, only the experimental group (n=15) engaged in the twelve-week yogic exercises, while the control group continued with their regular training routine without any yogic exercises. The twelve-week yogic training program was held in the mornings from 7:30 to 8:45 am, after their regular training sessions. The training included Sukshma Vyayam (micro exercises), Suryanamaskara (sun salutation), Asanas (static and dynamic postures), Pranayamas (breathing practices), Kriyas (cleansing processes), yogic relaxation, and Dhyana (meditation). During the first and second weeks, the training lasted forty-five (45) minutes with new asanas introduced in the second week. In the third and fourth weeks, the training extended to fifty (50) minutes, adding new asanas and mantra chanting in the fourth week. From the fifth to the eighth week, the sessions were sixty (60) minutes long, incorporating additional asanas, pranayamas, and kriyas. In the ninth to twelfth weeks, the training duration increased to seventy-five (75) minutes.

RESULT:

The analysis of dependent 't'-test on the data obtained from the experimental and control group for Forced Vital Capacity is analyzed and presented in Table 2.

Table 2: Comparison of Forced Vital Capacity Among Experimental and Control Group Male Soccer Players

Group	N	Test	Mean	SD	SEM	t - Value	p – Value
Experimental Group	15	Pre-test	5.55	0.61	0.16	19.13	.000*
		Post-test	6.47	0.55	0.14		
Control Group	15	Pre-test	5.11	0.56	0.14	11.10	.000*
		Post-test	5.49	0.52	0.13		

* Significant at 0.05 level (p<0.05)

Table 2 reveals the descriptive characteristics of pre-test and post-test measurements

of the experimental and control group in context of their force vital capacity in terms of mean and standard deviation. The force vital capacity mean \pm SD of the experimental group during pre-test and post-test are 5.55 ± 0.61 and 6.47 ± 0.55 respectively. In the control group, the force vital capacity mean \pm SD during pre-test and post-test are 5.11 ± 0.56 and 5.49 ± 0.52 respectively.

Table 2 also reveals that there is a significant difference in the experimental pre-test and post-test observations on force vital capacity of male soccer players. The obtained t-value of the experimental group on force vital capacity is 19.13 and the p-value is less than 0.05 level. Similarly, in the control group, pre-test and post-test observations on force vital capacity are also found to be significant, as the obtained t-value of the control group is 11.10 and p-value is less than 0.05 level. Which stated that there is a significant difference between pre-test and post-test mean scores of experimental and control group male soccer players. If we go into a deeper analysis of the coefficient of variance in both pre and post-test on experimental and control group, we find that it is 10.99, 8.5, 10.95 and 9.47 percent respectively which means that the experimental group consistently responded towards the yogic training as compared to control group.

Further, the ANCOVA was employed to determine the significance of yogic exercises on the forced vital capacity of male soccer players as compared to the control group and it is presented in Table 3.

Table 3: Analysis of Covariance on Forced Vital Capacity of the Experimental and Control Group

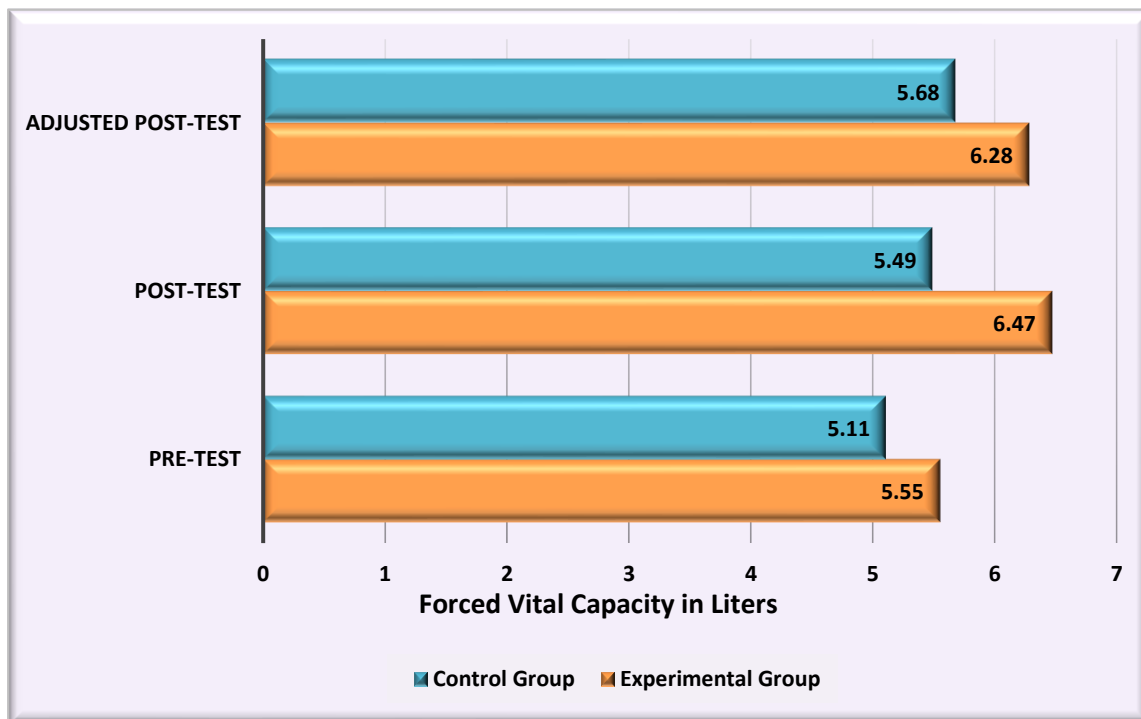
Source of Variance	SS	df	MS	F	Sig.
Between	2.35	1	2.35	105.43	.000*
Within	.60	27	.02		

* Significant at 0.05 level ($p < 0.05$)

A glance at Table 3 shows that for analysis of covariance, a significant difference exists between the experimental and control group in relation to force vital capacity. The 'F' value for the adjusted post-test mean is 105.43 and p-value is less than 0.05 level of significance for

degree of freedom 1 and 27. Hence, it is concluded that due to the effect of twelve weeks of yogic exercise, the force vital capacity of male soccer players has significantly improved. The pre-test, post-test, and adjusted post-test mean scores of control group and experimental group for force vital capacity are graphically presented in Figure 2.

Figure 2: Graphical Presentation of Mean Scores on the Forced Vital Capacity



CONCLUSIONS:

In summary, the present work reveals an overriding endeavor to explore the effects of yogic exercises on FVC of male soccer players. The result of 't'-test showed a significant ($p < 0.05$) improvement in FVC of both experimental and control group, whereas results of ANCOVA revealed that there was a significant difference between the adjusted post-test mean scores of experimental and control groups. It concludes that 12-week yogic exercise enhances the FVC which, further help in improving lung function of male soccer players in turn, might enhance the performance capacity of soccer players. On the basis of findings of the study it is recommended to engage sports persons in regular yogic exercises for the improvement of pulmonary function and enhancement of sports performance of male soccer training.

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