



ISSN: 2456-4419

Impact Factor: (RJIF): 5.18

Yoga 2023; 8(1): 01-03

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www.theyogicjournal.com

Received: 01-10-2022

Accepted: 07-11-2022

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Effect of concentration training exercises on the general mental intelligence of collegiate athletes of Lucknow

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DOI: <https://doi.org/10.22271/yogic.2023.v8.i1a.1361>

Abstract

Yoga is a collection of physical, mental, and spiritual exercises that have their roots in ancient India. They are meant to regulate (yoke) and rest the mind while acknowledging an objective witness awareness that is unaffected by the mind (Chitta) and everyday suffering (Dukha). Hinduism, Buddhism, and Jainism all have different schools of yoga with different practices and objectives, and both ancient and contemporary yoga is practiced all across the world. A total score obtained from a series of standardised tests or subtests created to gauge human intelligence is known as an intelligence quotient (IQ). This study was conducted to check whether the concentration exercises of yoga improve active athletes' mental ability in terms of intelligence quotient or not. For the study, a sample of 30 collegiate athletes (aged 21.5 ± 3.5) was taken. 'A group test of general mental ability questionnaire' by Dr. S. Jalota was taken into account as the dependent variable. A four-week concentration training program, as a treatment, was administered to the subjects. The mental ability test was conducted before and after the completion of the program. The differences in scores were measured by paired samples t-test and the results were computed using IBM SPSS 26 software. The 0.05 level of significance was set for the study. The result showed that there was a significant improvement in the IQ of the participants after the training completion. Additional recommendations for future research were provided.

Keywords: Collegiate athletes, yoga, mental ability, intelligent quotient

Introduction

To determine predictors of aptitude or performance, the majority of higher education institutions and professional disciplines must make decisions regarding student admissions and evaluations. The predictive usefulness of conventional measures of aptitude and performance, such as grade point average (GPA) and test scores, varies. Other techniques used by certain universities to choose applicants for admission include writing samples, personality tests, in-person one-on-one interviews, and group interviews, among others. For a number of reasons, colleges and institutions of physical education are examining their student admissions procedures more and more (Romanelli *et al.*, 2006) ^[7]. People must intensely motivate themselves to achieve their goals in a sport-related atmosphere. As a result, when under pressure and in a competitive environment, athletes feel both positive and negative emotions (Campo *et al.*, 2017; McCarthy *et al.*, 2013) ^[2, 4].

Tang and others have conducted research and discovered that regular meditation appears to enhance people's focus and emotional regulation in particular. Hence they concluded that "Mindfulness meditation has been shown to cause distinct changes in brain structure and brain function (Tang *et al.*, 2020) ^[8]". According to a review of 23 studies, those who have been meditating for a shorter length of time often score better on tests that measure their capacity to block out distractions, while longer-term meditators exhibit a noticeably improved capacity to focus for very long periods of time. 15 of these researches examined the changes non-meditators endured after a period of meditation with those of people who had never meditated. They were all randomised controlled trials (Chiesa *et al.*, 2011) ^[3].

Yoga is seen to be connected to Indian religion or modern spirituality, despite the fact that the initial association may be with a fully secular exercise.

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Yoga practitioners frequently emphasise that the word 'yuj' or 'yoke' which means "to connect" is the origin of the practice (Whitney, 1885) [10]. Yoga, according to many modern practitioners, is the joining of the self with God, or the finite with the infinite. However, the word 'yoga' can indicate a variety of things in both ancient and modern contexts, such as 'skill in work, desireless action, acquisition of real knowledge, indifference to pleasure and suffering, addition (in arithmetic), and conjunction (in astronomy)' (Banerji, 1995) [1].

Numerous scientific studies on yoga have previously been conducted, concluding that the yogic positions offer significant physiological and psychological advantages. It is a traditional Indian technique designed to keep a person mentally and physically well. Asana, pranayama, and meditation techniques were combined in earlier studies as an intervention. People may benefit from balancing asana training to increase their focus and attention spans (Thakur *et al.*, 2018) [9].

Previously conducted researches suggest that yoga helps to enhance both physical and emotional well-being. There are, however, few studies addressing academic performance, attention, and concentration in relation to yoga in college students. Therefore, the purpose of this study was to find out the effect of concentration training exercises on the general mental intelligence of collegiate athletes.

Research Methodology

30 collegiate athletes (male and female) from Aryavart Institute of Higher Education, Lucknow were chosen for the study based on random sampling. All of the participants were active athletes. All of the subjects had at least three years of competition participating experience and had taken part in events and sports meets at the inter-collegiate level or higher. Participants ranged in age from 18 to 25. The study's objective was to evaluate general mental ability (intelligent quotient) before and after the four-weeks concentration training program. Intelligent quotient before and after four-weeks training program was taken using 'A group test of general mental ability questionnaire' by Dr. S. Jalota by the researchers. Prior to the training, it was ensured that each individual was in good physical as well as psychological conditions and that they were all willing participants.

Training Program

Before starting the program, the subjects were asked to fill the 'Group test of general mental ability questionnaire' upon their consent. After the questionnaire was duly filled, the instructions about the four-weeks training program (three days a week) were given to the participants. None of the subjects left the training program in between. The training program included primarily Yoga concentration exercises such as meditation, pranayama, surya namaskar, vrikshasana, tadasana, vajrasana and padmasana etc (PP *et al.*, 2018; Thakur *et al.*, 2018) [6, 9]. One Yoga session used to last at least one hour in both indoor and outdoor, depending on climatic conditions, in the morning 06:00 AM routine.

After the completion of the four-weeks program, the participants were asked to fill the same questionnaire, and the data was recorded. The participants were also asked to fill feedback form regarding the training session; most of the respondents stated that they wanted this program to last long

and that they wanted to continue it further. However, the time duration being the limitation, this program could not be continued longer by the researchers.

Although all necessary efforts were made to control the extraneous variables, however, the researchers did not have a control over the individual differences of intelligence of the subjects. Another limitation was that the researchers did not have the control over the activities of subjects other than concentration training.

Statistical Techniques

To compare pre-test and post-test, a paired samples t-test with a significance level of 0.05 was used as the statistical method. The results were computed using IBM SPSS 26.

Analysis of Data

The general mental ability test data was evaluated to see if there was any change between pre-test and post-test readings. The mean and standard deviation of the descriptive statistics were computed. Additionally, the significance of the difference between the Pre-test and post-test data was examined using the paired samples t-test.

Table 1: Test scores obtained by the subjects.

Sr. No.	Pre-Data	Post-Data	Sr. No.	Pre-Data	Post-Data
1.	35	39	16.	49	52
2.	36	40	17.	62	65
3.	47	50	18.	53	57
4.	44	47	19.	38	42
5.	46	51	20.	41	48
6.	41	39	21.	38	44
7.	45	47	22.	50	55
8.	36	42	23.	58	64
9.	49	55	24.	39	47
10.	38	44	25.	63	65
11.	40	52	26.	46	52
12.	56	62	27.	50	55
13.	45	48	28.	37	46
14.	49	50	29.	42	53
15.	45	47	30.	45	48

The above table represents the test scores obtained by the participants before and after the four-weeks concentration training program.

Table 2: Descriptive statistics

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test	45.43	30	7.523	1.374
	Post-test	50.20	30	7.289	1.331

In above table, a descriptive statistical study of test scores before and after the four weeks training program is presented.

Mean of post-test (50.20) is higher than the mean for pre-test (45.43); as higher scores on the post-test represent improvement in scores, it appears that the training program might have been effective.

Table 3: Paired samples correlations.

Paired Samples Correlations					
			N	Correlation	Sig.
Pair 1	Pre-test & Post-test		30	.925	.000

The above table represents the paired samples correlations (if any) of pre-test and post-test.

Table 4: t-test statistics.

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-4.767	2.873	.525	-5.839	-3.694	-9.087	29	.000

In above table, the t-test results that distinguish between mental ability before and after four-weeks training program are presented.

Discussion of Findings

Table 3 (Paired Samples Correlations) informs us that the Pearson correlation between the test scores scores is .925. The Sig. value of .000 indicates that the chances of this correlation occurring by chance if the null hypothesis is true is less than .001, and we would take this to be statistically significant.

Table 4 shows the results of the t test. The mean difference -4.767 (mean of pre-test – mean of post-test) is negative because the posttest scores are higher than the pretest scores. The standard deviation of the differences between pairs of variables is 2.873, and the correlated difference standard error of the mean is .525. The value of the t statistic is -9.694; with 29 degrees of freedom (N – 1), the Sig. value of .000 indicates that the chances of this correlation occurring by chance if the null hypothesis is true is less than .001. We therefore conclude that the four-weeks concentration training significantly improved the general mental ability score of the participants.

The mental ability test shown a significant improvement in the scores of the participants after a four-weeks concentration training program. However, a possibility of improvement in scores due to another factor such as the participants' experience from the previous test-taking cannot be denied.

The impact of meditation on achieving self-directed goals may not have been measurable due to time restrictions and a brief meditation practise (Paholpak *et al.*, 2012)^[5].

Conclusions

When compared, post-training mental ability test scores were found to significantly higher than pre-training mental ability test scores. Thus, it may be inferred that the concentration training may be a helpful aspect to raise the intelligent quotient of the collegiate athletes (Thakur *et al.*, 2018)^[9] which may advance them in terms of decision making and developing strategies in their respective games.

The study would benefit from better experimental circumstances and a more controlled control of the extraneous variables in order to achieve a more accurate measurement of the intelligent quotient. Given that only collegiate athletes served as the study's subjects, it is possible to carry out similar research on school-going athletes as well. Similar study can also be done for conditions that are different, such as at different altitude. Athletes from various age groups can also be studied.

Scales for assessing distraction and the frequency of ruminative thoughts and behaviours need to be taken into consideration while examining any potential calming impact that might be brought about by meditation.

Scales for assessing distraction and the frequency of ruminative thoughts and behaviours need to be taken into consideration while examining any potential calming impact that might be brought about by meditation. In order to provide a better contextual understanding of any changes in the phenomenological level of intra-personal experience, additional research is therefore necessary, particularly if it includes qualitative data from each participant (Paholpak *et al.*, 2012)^[5].

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