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Effects of yogic exercises on selected physical fitness variables of sports persons

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Abstract

30 healthy state level male players from handball, volleyball, taekwondo and judo games ranging in age from 15-19 year were selected for the study. The purpose of the study was to determine the effects of yogic exercises on selected physical fitness variables including muscular strength and endurance of arms and shoulders, speed and agility, muscular strength and endurance of trunk, explosive strength of legs, speed of lower extremities and cardio-vascular endurance. 6 weeks training programme, 5 days per week was scheduled for experimentation. 30 subjects were equally divided into two groups i.e. yogic exercise group (n= 15) and control group (n=15). The subjects of yogic exercise group were given one hour training programme in the morning session including warm up, yogic Asanas, Pranayama and cool down. Control group was not offered any activity. The subjects were evaluated before and after training programme using modified AAHPER youth fitness test (1976). After collecting the data mean, S.D and t-ratio were tested. Paired t-test was employed to check if any significant difference exists or not between pre and post-test scores of Yogic exercise group and pre and post test scores of Control group. Independent t-test was used to check significant difference between pre scores of yogic exercise and Control group and post-test scores of yogic exercise and Control group. The findings indicate that regular yogic practice can elicit improvements in the aspects of all physical fitness variables.

Keywords: Physical Fitness, Yogic Asanas, Pranayamas

Introduction

In today's competitive world intellectual and scientific environment has brought revolution in every field including games and sports. Scientific researchers contributed a lot in the field of sports by developing new techniques and training methods (Kochher S.K. 1957) [1]. Physical capabilities i.e. speed, explosive strength, muscular strength, muscular endurance, agility, cardio-respiratory endurance and co-ordination are being developed by using modern techniques and methods. All the games require physical fitness. Yogic exercises and pranayama helps to improve physical fitness and performance. The word Yoga is derived from Sanskrit root word 'Yuj' which means 'to bind', 'to join' or 'to attach' which refers to 'oneness' or 'union'. Yoga is an ancient art of exercising described in Vedic scriptures. Yoga is a sophisticated system for achieving radiant physical health, superb mental clarity and peace of mind (Schiffmann, 1996) [4]. Yoga is a light, which one lit, will never dim. The better you practice, the brighter the flame (B.K.S. Iyenger, 2001). Yogic Asanas are the 'Physical Positions' or 'Postures' which co-ordinate with movements to hold the position to stretch and strengthen different parts of body. Yogic Asanas are beneficial to strengthen all the body parts, smooth functioning of internal organs and helpful in weight loss. It effectively influences our central nervous system and insulin level. Pranayama is also very beneficial for exercises of diaphragm, abdomen, spleen, liver, pancreas and kidney etc. which directly or indirectly contributes to physical fitness of sportsperson. Pranayama is a controlling process of 'Prana' or 'Breath' (Inhalation and Exhalation). Pranayama is helpful in purification of body by removing waste products through the process of inhalation and exhalation. Today elite athletes are given training of yoga, pranayama and meditation for improvement in physical fitness and concentration as well. Kevin Pederson (2011) says that Yoga helps men perform chosen competitive sports. Yoga provides solace to restless mind, is a boon to sick people, yoga is a fashion of common man at present time and overall is a key to wellness, health, beautiful physique and sharp intelligence (Nagarathan, 2003).

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Methodology

This study involved 30 state level male players (8 Handball players, 8 Volleyball players, 8 Taekwondo players and 6 Judo players) aged 15-19 years. All the subjects were selected from Shah Satnamji Boys School Sirsa (Haryana), where all subjects were equally distributed into two group i.e Yogic exercise group (n=15) and Control group (n=15). After pre-test Yogic exercise group was given selected Asanas (Trikonasana, vrikshasana, tadasanabhujangasana, dhanurasana, gomukhasana, matayasana, paschimotanasana, savasana and pranayama (ujjayi and anulom-vilom). 3 sets of Asanas with 50% intensity for first two weeks, 4 sets of Asanas with 60% intensity for 3rd week, 5 sets of Asanas with 60% intensity for 4th week, 3 sets of Asanas with 70% intensity for 5th week and 5 sets of Asanas with 70% intensity for 6th week were prescribed at 4:1 ratio for training purpose with 20-30 seconds holding time and 3-5 second rest in between Asanas for six weeks, 5 days a week. Puraka, kumbhaka and rechaka Ratio of Anulom-Vilom and Ujjayi Pranayama for first 3 weeks was 1:2:2 and 2:4:4 and 1:4:2 and 4:8:8 for next 3 weeks respectively. Every Thursday and

Sunday was rest day. Muscular strength (dynamic) and muscular endurance of arms and shoulders, speed and agility, muscular strength and endurance of trunk, explosive strength of legs, speed of lower extremities and cardio-vascular endurance were selected as criterion variables. Subjects were evaluated before and after training programme using modified AAHPER youth fitness test (1976) which contains pull up, 10x4 yards shuttle run, bent knee sit ups, standing broad jump, 50 yards dash, 12 minutes run/walk to test selected criterion variables. After collecting the data Paired t-test was employed to check if any significant difference exists or not between pre and post-test scores of Yogic exercise group and pre and post test scores of Control group. Independent t-test was used to check significant difference between pre scores of yogic exercise and Control group and post-test scores of yogic exercise and Control group.

Results and Analysis

Significance of difference between pre and post test scores of physical fitness of yogic exercise group

Table 1

Sr. no	Test items	scores	N	Mean	S.D	t-value	Significance
1.	Pull ups	Pre	15	10.00	2.17	-14.64	.001
		Post	15	12.33	2.38		
2.	Bent knee sit ups	Pre	15	32.73	1.98	-20.69	.001
		Post	15	37.00	1.77		
3.	Shuttle run	Pre	15	10.98	.20	57.71	.001
		Post	15	10.73	.21		
4.	Standing broad jump	Pre	15	1.91	.05	-12.93	.001
		Post	15	1.95	.05		
5.	50 yard dash	Pre	15	7.27	.37	19.73	.001
		Post	15	7.00	.33		
6.	12 minutes run/walk	Pre	15	2.56	140.94	-21.18	.001
		Post	15	2.75	146.17		

*Significant level =0.05

Table value (df=14) =2.145

The above table clearly evident that the pre and post-test mean scores of pull up ($10.00 \pm 2.17 < 12.33 \pm 2.38$), pre and post mean scores of bent knee sit ups ($32.73 \pm 1.98 < 37.00 \pm 1.77$), pre and post mean scores of shuttle run ($10.98 \pm .20 > 10.73 \pm .21$), pre and post mean scores of standing broad jump ($1.91 \pm .05 < 1.95 \pm .05$), pre and post-test mean scores of 50 yard dash ($7.27 \pm .37 > 7.00 \pm .33$) and pre and post-test mean scores of 12 minutes run/ walk ($2.56 \pm 140.94 < 2.75 \pm 146.17$) which are significant at 0.05 level. It means that there is significant difference between pre and post scores of all the tested items. It is indicated that $t_{14} = -$

14.64 (pull ups), -20.69 (bent knee sit up), 57.71 (Shuttle run), -12.93 (Standing broad jump), 19.73 (50 yard dash) and -21.18 (12 minute run/walk) are significant at 0.05 level of significance because ($p=0.001$, of all tested items)

It was hypothesized that there will be no significant difference in pre and post test scores of physical fitness of variables of yogic exercise group but result shows that significant difference exists in pre and post scores of all tested items. Hence, the null hypothesis was rejected.

Significance of difference between pre and post test scores of physical fitness of control group

Table 2

Sr. no	Test items	Scores	N	Mean	S.D	t-value	Significance
1.	Pull ups	Pre	15	10.26	2.31	-2.09	.06
		Post	15	10.60	2.23		
2.	Bent knee sit ups	Pre	15	32.40	1.99	-2.09	.06
		Post	15	32.73	1.75		
3.	Shuttle run	Pre	15	10.97	.20	1.58	.14
		Post	15	10.87	.39		
4.	Standing broad jump	Pre	15	1.91	.05	-2.10	.06
		Post	15	1.91	.05		
5.	50 yard dash	Pre	15	7.28	.38	1.78	.10
		Post	15	7.28	.38		
6.	12 minutes run/walk	Pre	15	2.57	165.25	-1.32	.21
		Post	15	2.58	174.04		

*Significant level = 0.05

Table value (df=14) =2.145

The above table clearly explains that the pre and post-test mean scores of pull up ($10.26 \pm 2.31 < 10.60 \pm 2.23$), pre and post mean scores of bent knee sit ups ($32.40 \pm 1.99 < 32.73 \pm 1.75$), pre and post mean scores of shuttle run ($10.97 \pm .20 > 10.87 \pm .39$), pre and post mean scores of standing broad jump ($1.91 \pm .05 = 1.91 \pm .05$), pre and post-test mean scores of 50 yard dash ($7.28 \pm .38 = 7.28 \pm .38$) and pre and post-test mean scores of 12 minutes run/ walk are ($2.57 \pm 165.25 < 2.58 \pm 174.04$), which are not significant at 0.05 level . It means that there is no significant difference between pre and post scores of all the tested items. It is indicated that $t_{14} = -2.09$ (pull ups), -2.09 (bent knee sit up), 1.58 (Shuttle run), -2.10 (Standing broad jump), 1.78 (50 yard dash) and -1.32 (12 minute run/walk) are not significant at 0.05 as t-value is less than table value.

It was hypothesized that there will be no significant difference in pre and post test scores of physical fitness of variables of control group and result shows that no significant difference was found between pre and post scores of all tested items. Hence, the null hypothesis was accepted.

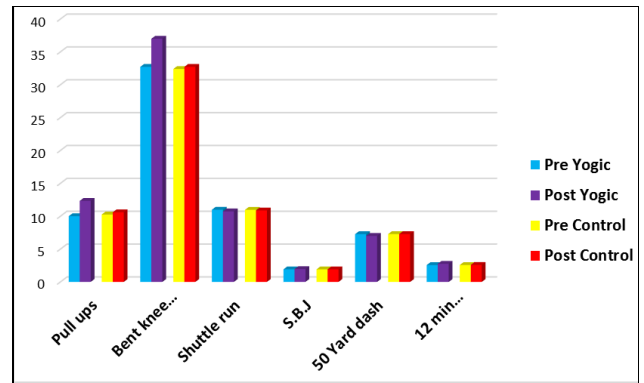


Fig 1: Comparison of pre and post test scores of yogic exercise group and control group

Comparison of significance of difference between yogic exercise group and control group pre-test scores of physical fitness

Table 3

Sr. no	Test items	Scores of post test	N	Mean	S.D	S.E.M	t-value	Sig.
1.	Pull Ups	Yogic exercise group	15	10.00	2.17	0.56	-.326	0.747
		Control group	15	10.27	2.31	0.60		
2.	Bent knee sit ups	Yogic exercise group	15	32.73	1.98	0.51	.000	1.000
		Control group	15	32.73	1.98	0.51		
3.	Shuttle run	Yogic exercise group	15	10.98	.20	0.05	.099	0.922
		Control group	15	10.97	.20	0.05		
4.	Standing broad jump	Yogic exercise group	15	1.91	.05	.01	.037	0.971
		Control group	15	1.91	.05	.01		
5.	50 yard dash	Yogic exercise group	15	7.27	0.36	.10	-.064	0.950
		Control group	15	7.28	0.37	.10		
6.	12 minutes run/walk	Yogic exercise group	15	2.56	140.95	36.39	-.107	0.916
		Control group	15	2.57	165.25	42.67		

*Significant level = 0.05

Table value (df=28) =2.048

Findings of the study indicates that pull up mean score of Yogic exercise group (10.00 ± 2.17) is less than mean scores (10.27 ± 2.31) of Control group. However t value is -0.326 which is not significant (i.e. $p > 0.05$: because $p = 0.747$). Bent knee sit ups mean score of Yogic exercise group (32.73 ± 1.98) is equal to mean scores (32.73 ± 1.98) of Control group. However t value is 0.000 which is not significant (i.e. $p > 0.05$: because $p = 1.000$). Shuttle run mean score of Yogic exercise group (10.98 ± 0.20) is higher than mean scores (10.97 ± 0.20) of Control group. However t value is 0.099 which is not significant (i.e. $p > 0.05$: because $p = 0.992$). Standing broad jump mean score of Yogic exercise group (1.91 ± 0.05) is equal to mean scores (1.91 ± 0.05) of Control group. However t value is 0.037 which is not significant (i.e. $p > 0.05$: because $p = 0.971$). 50 yard dash mean score of Yogic exercise group

(7.27 ± 0.36) is less than mean scores (7.28 ± 0.37) of Control group. However t value is -0.064 which is not significant (i.e. $p > 0.05$: because $p = 0.950$). 12 minutes run/ walk mean scores of Yogic exercise group (2.56 ± 140.95) is less than mean scores (2.57 ± 165.25) of Control group. However t value is -0.107 which is not significant (i.e. $p > 0.05$: because $p = 0.916$).

It was hypothesized that there will be no significant difference between pre-test scores of selected physical fitness variables of Yogic exercise and Control group and result shows that no significant difference exists between pre-test scores of all tested items. Hence, the null hypothesis was accepted.

Comparison of significance of difference between yogic exercise group and control group post test scores of physical fitness

Table 4

Sr. no	Test items	Scores of post test	N	Mean	S.D	S.E.M	t-value	Sig.
1.	Pull ups	Yogic exercise group	15	12.33	2.38	.614	2.058	.049
		Control group	15	10.60	2.23	.575		
2.	Bent knee sit ups	Yogic exercise group	15	37.00	1.77	.457	6.631	.001
		Control group	15	32.73	1.75	.452		
3.	Shuttle run	Yogic exercise group	15	10.73	0.20	0.053	-3.066	.005
		Control group	15	10.96	0.20	0.052		
4.	Standing broad jump	Yogic exercise group	15	1.95	0.05	0.014	2.218	.035
		Control group	15	1.90	0.05	0.013		
5.	50 yard dash	Yogic exercise group	15	7.00	0.33	0.086	-2.079	.047
		Control group	15	7.28	0.38	0.098		
6.	12 minutes run/walk	Yogic exercise group	15	2.75	146.17	37.74	2.857	.008
		Control group	15	2.58	174.04	44.94		

*Significant level = 0.05

Table value (df=28) =2.048

Findings explores that pull up mean score of Yogic exercise group (12.33 ± 2.38) is higher than mean scores (10.60 ± 2.23) of Control group. However t value is 2.058 which is significant (i.e. $p < 0.05$: because $p = 0.049$) and shows significant improvement in pull up performance of yogic exercise group. Bent knee sit ups mean score of Yogic exercise group (37.00 ± 1.77) is higher than mean scores (32.73 ± 1.75) of Control group. However t value is 6.631 which is significant (i.e. $p < 0.05$: because $p = 0.001$) and shows significant improvement in bent knee sit ups performance of yogic exercise group. Shuttle run mean score of Yogic exercise group (10.73 ± 0.20) is less than mean scores (10.96 ± 0.20) of Control group which shows decrease in timings. However t value is 3.066 which is significant (i.e. $p < 0.05$: because $p = 0.005$) and shows significant improvement in shuttle run performance of yogic exercise group. Standing broad jump mean score of Yogic exercise group (1.95 ± 0.05) is higher than mean scores (1.90 ± 0.05) of Control group. However t value is 2.218 which is significant (i.e. $p < 0.05$: because $p = 0.035$) and shows significant improvement in standing broad jump performance of yogic exercise group. 50 yard dash mean score of Yogic exercise group (7.00 ± 0.33) is less than mean scores (7.28 ± 0.25) of Control group. However t value is -2.079 which is significant (i.e. $p < 0.05$: because $p = 0.047$) and shows significant improvement in running/ 50 yard dash performance of yogic exercise group. 12 minutes run/ walk mean score of Yogic exercise group (2.75 ± 146.17) is higher than mean scores (2.58 ± 174.04) of Control group. However t value is 2.857 which is significant (i.e. $p < 0.05$: because $p = 0.008$) and shows significant improvement in cardio-vascular/ 12 minutes run/walk performance of yogic exercise group.

It was hypothesized that there will be no significant difference between post test scores of selected physical fitness variables of Circuit training and Control group but result shows that significant difference exists between post test scores of all tested items of Yogic exercise group and Control group. Hence, the null hypothesis was rejected and there was significant improvement in performance after Circuit training.

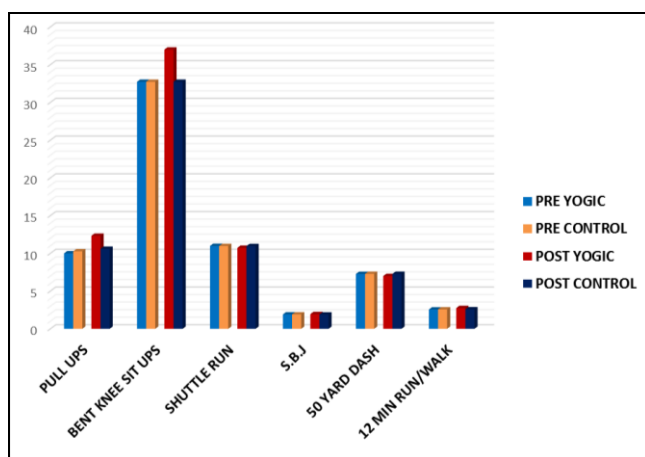


Fig 2: Comparison of pre yogic and pre control scores and post yogic and post control group scores

Findings

1. There is significant difference between pre and post test scores of Yogic exercise group.
2. There is no significant difference between pre and post test scores of Control group.
3. There is no significant difference between pre-test scores

of Yogic exercise group and Control.

4. There is significant difference between post test scores of Yogic exercise group Control group.

Conclusion

On the basis of the findings, it is concluded that Yogic exercises and Pranayama are effective for improvement of muscular strength and endurance of arms and shoulders, speed and agility, muscular strength and endurance of trunk, explosive strength of legs, speed of lower extremities and cardio-vascular endurance.

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