

ANALYSIS OF VO₂MAX IN DIFFERENT TEAM GAMES**O. Bhagat¹ and L.T. Singh²**

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¹bhagat.lieshemba@gmail.com, ²thambalsingh@gmail.com**ABSTRACT**

Maximal oxygen uptake (VO₂max) is an essential physiological factor that determines the cardiorespiratory endurance capacity of players. The majority of authors regard maximal oxygen uptake (VO₂max) as the best indicator of an individual's aerobic capacity and the best indicator of an athlete's physical capacity. The objective of the study is to find out the characteristics and significant differences in VO₂max among different team games. For this study, 120 (N=120) national players, 30 each from football, field hockey, handball and basketball between 18 to 30 years of age, who undergo regular practices were selected randomly as subjects. Cooper's 12 min Run/Walk test was administered to obtain the data. The characteristics and significant differences were determined by using the descriptive and analysis of variance (ANOVA) statistical techniques and tested at 0.05 level of confidence. The mean \pm standard of football, hockey, handball and basketball were 59.02 \pm 2.40, 58.03 \pm 2.37, 52.74 \pm 3.64 and 51.13 \pm 3.66, respectively. Significant differences were found among the selected team games as the calculated $F = 47.66$ ($p < 0.05$) at 0.05 level of confidence. Since the F -ratio was found to be significant, the Scheffe post hoc test was conducted. The result of the study showed the significant differences of VO₂max among the team games. VO₂max could be determined as an indicator of high intensive aerobic endurance in team games. VO₂max is considered a performance predictor.

Keywords: Football, Field Hockey, Handball, Basketball and Cooper's 12 min run/walk test.

1. Introduction

Every human being has a fundamental right to access physical activities and sports, which are essential for the full development of his personality. The freedom to develop physical, intellectual and moral powers through physical education and sports must be guaranteed both within the educational system and in other aspects of social life (UNESCO, 1978). In the field of games and sports, every individual and player has to perform at their peak level to achieve their goal. Their best level can be achieved through all-round development of physical, mental, emotional, social, and spiritual through proper exercise and guidance. Now a day people have forgotten about health and fitness as they are extremely focusing on achieving things rather than physical fitness and health. 'The physical development of a sportsman at the peak of his performance has also become of prime interest to anyone involved in the cultivation of young sportsmen. In the recent past, in India also, there have been attempts to search for talent and to determine various factors, which could be responsible for ultimate success. The sports scientists working with the top coaches in the sport concerned are trying to find out the basic physical, physiological, and psychological characteristics that might be the performance limiting factors' (Brar, 1991). Most team games are played in

fast movements in modern games to achieve more success and winning records overwhelming the opponent. Players get more fitness and skillful, execute the series of movement patterns high intensively. Ultimately, players require high aerobic and anaerobic qualities to maintain and accelerate the tempo of the game.

Among the team games, football, field hockey, handball and basketball are the games that demand the high intensive physical fitness, physiological work efficiencies, high psychological consistency, competitive motor skill qualities, technical and tactical planning, etc. The performance characteristics of these team games reliant on high aerobic capacity, which is produced by the series of anaerobic type of activities throughout the game. The players of these games develop a similar level of performance-enhancing factors like high intensive speed, muscular strength, muscular power, muscular endurance, cardiovascular endurance, agility, coordination, balance, etc. These games are empowered with high strategic offensive and the defensive system of play. 'According to the American College of Sports Medicine (ACSM), cardio-respiratory fitness is determined by oxygen consumption, technically called VO₂. This is measured by how much oxygen (in millilitres) your body can use per kilogram of body weight per minute.

VO₂max is the maximum amount of oxygen the body can use, and it directly correlates to fitness capacity. An athlete with a VO₂max of 65 ml/kg/min will be able to perform at a high level for a longer duration than an athlete with a VO₂max of 40 ml/kg/min. However, this relates to aerobic work. Someone with a high VO₂max will not necessarily be able to perform at a higher capacity during resistance exercise or short-duration high-intensity work, such as sprints' (STACK, 2013). Literature of various research findings shows that VO₂max in football players can vary from 50 to 75 ml/kg/min. 'A large field, a fast-moving ball, and rare substitutions mean soccer players can expect to log some heavy mileage over 90-plus minutes. Midfielders tend to run the most, sometimes reaching nearly 9.5 miles, according to SportVU' (Fox, 2016). In football, players play the game for 90 min or more. The game hockey is played more about short, quick sharp actions and uncomfortable repeated movement patterns, which are executed explosively over 70 min. That makes it much more tiring than 30 min running at the same pace for a long distance. 'According to Tribesports, field hockey players travel more than athletes in almost any other sport, chasing and defending the ball for nearly 10km during 70 minutes of play. Hockey players have been observed with their own fitness criteria. While a 5km or 10km run will give athletes a base level of fitness, it won't give them what they need to compete in hockey' (Fox, 2016). 'In a study *'Analysis in Exercise and Sport'* (Coulson and Archer, 2009) found that the typical top-level field hockey player would have a VO₂max of 62-65 ml/kg/min. That is roughly the same as elite soccer players and 12-15 units higher than professional basketball players, which at the highest level is quite a substantial gap in aerobic fitness' (Dias, 2021). 'High level of skills and physical fitness required to play handball. To be a successful player in handball, high intensive muscular strength, muscular endurance, power, speed, agility, flexibility, balance, coordination, cardiovascular endurance, etc., are all important performance-limiting factors. Above these components, high aerobic and anaerobic physiological work capacities are indispensable fitness parameters to decide the performance as well as

maintaining the different intensive intermittent movements in different playing positions. During the handball game, players execute many accelerations, sprinting, turning, jumping, leaping, falling, struggling, etc., with direct contact with opponents. There is substantial sprinting, maximum jumping and blocking in defensive and offensive situations. During a match, players run about 4-6 km at a mean intensity close to 80-90% of maximal heart rate. Usually, many researchers estimate the maximal oxygen uptake (VO₂max) for handball players at an average of 46 ml/kg/min. However, according to different playing positions, VO₂max may be different (Soyal, 2016). 'In basketball, strength, power, speed and agility are essential fitness parameters that decorate the high skill abilities. However, basketball players have been found to cover about 4500-5000m (2.8-3.1 miles) during a 48min game (Crisafulli et al., 2002). Average VO₂max values for female and male basketball players have been reported in the range of 44-54 and 50-60 ml/kg/min, respectively (Ziv & Lidor, 2009).

Maximum oxygen uptake (VO₂ max) is defined as the highest rate at which oxygen can be taken up and utilized by the body during severe exercises. It is one of the main variables in the field of exercise physiology and is frequently used to indicate the cardiorespiratory fitness of an individual. Therefore it is a significant measure that indicates the functional capacity of the cardiorespiratory system. In the scientific literature, an increase in VO₂ max is the most common method of demonstrating a training effect and so it is frequently used in the development of an exercise prescription (Zwiren & Fredson, 1991; David & Howley, 2000).

Endurance, which is the ability of the body to perform activity for a long duration of time, is important to success in all games and sports. In high-intensity sports of short duration, endurance is considered the backbone to the activity concerned as well as assisting in the speedy and efficient recovery from the physical stress of the specific training. In other games and sports where endurance is a central aspect, such as distance running, team games like football, hockey, handball, basketball, etc., the maximal endurance capacity is reflected as the

ability of the players to consume and process more oxygen to continue the different intermittent activities for a long duration of the game efficiently. Therefore, it is expressed as the player's maximal oxygen uptake ($VO_2\max$). This is the prime importance for the high intensive team games to maintain the performance level from start to end of the game.

2. Objectives

The objectives of the study were:

2.1 To find out the characteristics of $VO_2\max$ in different team games.

2.2 To investigate the significant difference in maximal oxygen consumption among the selected team games.

4. Methodology

4.1 Selection of Subjects

One hundred and twenty (N=120) male National level players, 30 each from football, field hockey, handball and basketball of Manipur, were randomly selected for this study. The players were practicing under the Sports Authority of India (SAI), Youth Affairs

and Sports (YAS) and other reputed clubs of Manipur. All the subjects were residents of Manipur and they had a similar routine of works and undergoing regular practices. The age of the subjects ranged between 18-30 years. Cooper's 12 min run-walk test was used to collect the pertaining data for $VO_2\max$ measurement (Quinn, 2019).

4.2 Statistical Techniques

The Statistical tool employed in this study to see the characteristics and significant differences of $VO_2\max$ among the selected team games, descriptive and analysis of variance (ANOVA) test were applied and tested at 0.05 level of significance.

5. Results

The descriptive analysis of obtaining data of the selected team games i.e., football, hockey, handball and basketball, that determine the characteristics of $VO_2\max$ consisting the range (R), mean (M), standard deviation (SD), standard error (SE), variance (Var.), skewness (S) and kurtosis (K) have been shown in table 1.

Table-1: Descriptive Analysis Of $VO_2\max$ Of Team Games

Group	R	Min.	Max	M	SD	Var.	S	K
Football	8.05	54.65	62.70	59.02	2.40	5.74	-0.18	-1.04
Hockey	8.94	53.53	62.47	58.03	2.37	5.62	-0.05	-0.87
Handball	15.20	46.83	62.03	52.74	3.64	13.27	0.88	0.47
Basketball	18.10	43.47	61.57	51.13	3.66	13.36	0.62	1.49

The descriptive measures of $VO_2\max$ shown in table- 1 justify the characteristic values for national-level football, hockey, handball and basketball players. Further, it shows that the skewness of football, hockey, handball and basketball were -0.18, -0.05, 0.88 & 0.62, so the distribution of football and hockey were approximately symmetric as the skewness is between -0.5 and +0.5, and for handball and basketball, the skewness was moderately skewed as the skewness is between +0.5 and

+1. In addition, it shows that the kurtosis of football, hockey, handball and basketball were -1.04, -0.87, 0.47 & 1.49, so the distribution of football and hockey were too flat as the value is less than 0 and for handball and basketball, the distribution is too peak as the value is greater than 0.

The analysis of variance (ANOVA) to find out the significant means differences among the groups on the scores of $VO_2\max$ is shown in table 2.

Table-2: Significant Means Differences Among The Groups

Group	Mean	SD	F	Sig. (p-value)
Football	59.02	2.40	47.66*	0.00
Hockey	58.03	2.37		
Handball	52.74	3.64		
Basketball	51.13	3.66		

*Significant at 0.05 level of confidence; $F_{0.05}(3,116) = 2.68$

Table-2 reveals that there is a significant difference among the selected team games, i.e., football, hockey, handball and basketball, as the calculated $F = 47.66$ is quite higher than the tabulated $F = 2.68$ at 0.05 level of confidence to

the relevant degree of freedom (3,116). Since the F-ratio was found to be significant, to determine the paired mean differences among the groups, the Scheffe post hoc test was employed and shown in table 3.

Table-3: Paired Mean Comparison Among The Groups

Mean				Mean Diff.	Sig. (p-value)	Critical Diff.
Football	Hockey	Handball	Basketball			
59.02	58.03			0.99	0.67	0.796
59.02		52.74		6.28*	0.00	0.796
59.02			51.13	7.89*	0.00	0.796
	58.03	52.74		5.28*	0.00	0.796
	58.03		51.13	6.89*	0.00	0.796
		52.74	51.13	1.61	0.25	0.796

*Significant at 0.05 level.

It is evident from the above table- 3 that there is a significant difference between football & handball (MD=6.28), football & basketball (MD=7.89), hockey & handball (MD=5.28),

hockey & basketball (MD=6.89) as the obtained p-value is greater than 0.05 level of significance. The mean differences are graphically represented in fig-1.

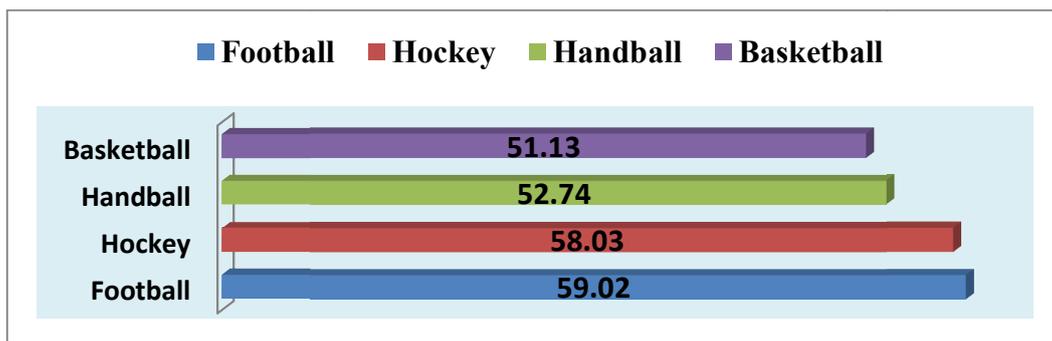


Fig. 1 :Graphical representation of mean differences among the selected team games

6. Discussion

The statistical analysis finding reveals significant differences in maximal oxygen consumption (VO₂max) among the selected four team games. To conclude the discussion of findings, it can be stated that subjects chosen in this study were mainly chosen from different regular match practice groups of the selected games. The impact of other activities could not be nullified; thus, the variations in VO₂ max of different games and sports groups might be observed. The values of VO₂max for normal sedentary individuals are between 38-40 ml/kg/min. This might be attributed to the fact that regular participation in physical education programmes influenced the overall VO₂ max (Singh & Patel, 2014; Kumar et al., 2015). In addition, it can also be concluded that the

significant differences between the selected team games might be due to the nature of the game, such as different ground measurements, duration of the game, physiological activities, training method, etc. By post hoc test, it was concluded that there was no significant difference in mean comparison among some games. All the selected games involve walking, sprinting, jogging, jumping, throwing, etc., in varied directions with or without the ball. There are many accelerations and decelerations of movements during the match with a vast number of changes in the direction of play, which involve more loading on muscles. The players who can cope with the play's competition demand can reach the level of an elite player. The intermittent high-intensity pattern of activity during the match requires a high function of both the aerobic and anaerobic

energy delivery pathways. Natures of the game, demands of energy, same routine, same habitation, adaptation to the same training provided, etc., might be the reason for no significant differences in aerobic capacity among some similar games. The amount of distance covered during the game of football has a role to play in the significantly higher VO₂max of football players. This shows that football is a more demanding sport in the intensity of workload, total miles covered and duration during training, and the game itself than most games. It can be said that the reason behind a higher VO₂ max of football players compared to handball and basketball players is the combined effect of covered distance owing to the large football pitch and a longer duration of play when compared to basketball pitch and duration of play (Chittibabu & Chandrasekar, 2014; Kumar et al., 2015; Kumar & Bhat, 2014; Ibikunle & Enumah, 2016; ACSM, 2000; Anderson, 1992; Souza, 2014). Therefore, it could be observed that football players reliant on higher VO₂max than other team games.

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7. Conclusions

This study concluded that there was a significant difference in maximal oxygen consumption (VO₂max) among the selected team games. The significant differences might be due to the differences in ground dimension, nature of play, duration of games, energy demand, intensity and volume of training, distance covered during the match and other performance-limiting factors. Therefore, coaches or trainers should observe the increment of VO₂max and its effecting factors to maintain the performance level of players.

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COMPARISON OF PERSONALITY TRAITS BETWEEN VISUAL AND LOCOMOTOR IMPAIRED SPORTSMAN AND NON-SPORTSMAN

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ABSTRACT

To purpose of the study was to compare the personality traits between visual-impaired sportsman and visual-impaired non-sportsman, and locomotor-impaired sportsman and locomotor-impaired non-sportsman among the physically challenged people. R.B. Cattell's 16PF Questionnaire was administered on twenty (20) each visual-impaired and locomotor-impaired persons among the physically challenged population, consisting of 10 each sportsman and non-sportsman on both visual and locomotor impairment groups. The 't' test and standard ten score were employed to find out the significant differences between the groups. There were found insignificant differences between visual-impaired sportsman and non-sportsman in all 16 personality factors. The personality factors A, E, F, H, I, L, O, Q2 & Q3 were found significant differences between the locomotor-impaired sportsman and non-sportsman, however, insignificant differences were found in the scale of standard ten scores for both groups.

Keywords: Personality traits, visual impairment, locomotor impairment, 16PF.

1. Introduction

Everyone is born with innate capacities, capabilities and a sort at genetic blue print. The goal of life is to fulfill this genetic blue print to become whatever we are inherently capable of becoming and thus resulting into "fully functioning person". Physically challenged people are deprived from the opportunity of fulfilling their inborn potential. They become constricted, rigid and defensive. They feel themselves threatened, anxious and experience a Considerable discomfort and uneasiness. Some people realize that they do not know what they are and what they want but life itself is a continuous process of facing challenges. These challenges are different each time become the situation as well as the individual himself keeps changing well-adjusted people enjoy the difficulties of life. They do not step aside and rather accept the challenge and are willing to experience the pain and confusion[1].

Whether it is concerned with physically challenged people or normal population for both personality assessments is one form to help that sports psychology can offer. Personality assessment aims to identify individual traits and personality profiles. Personality assessment has been used now in the selection of athletes and also serves as a tool to evaluate sports gifted individual and to orient the child to specific sports activities. In recent year, psychologist and physical

educators have become increasingly interested in assessing the personality of athlete. There has been a general premise that athlete possess unique personality characteristic. He indicated the personality rating or trait of personality; dominance, persistence, drive and confidence have been found to go most often with success in the field of athletes [2].

Personality is an individual enduring persistent response pattern across the verities of situation it is compared relatively stable patterns of action often referenced to as traits dispositional tendencies motivations, attitudes and belief, which are combined into a more or less integrated self-structure. Personality includes the characteristics and attributes that distinguish the individual from others although different theoretical prospective on personality assign difference degrees of importance to genetic, social learning or broader socio-cultural elements more views consider each of these as important casual factors in the development of personality attributes. In general, most contemporary theories of personality consider both games and environment as important formative personality[3].

Personality involved from a number of influence. They may be divided into three broad categories as personal influence, social and cultural, and physical influence are the inherited biological characteristics that cause people to differ from each other. Personal

influence is the unique events experienced by the individual that cause long effects on him. Social and cultural influences are internationalization from the environment that surrounds the individual. These influences are absorbed from parents, educators, social institutions and Various Medias, and are the product of the society in which the person lives. Thus, when a child performs well in the socially sanctioned activity such as sports, he will usually receive reinforcement in the form of support from parents and other. The carriers of most of the athletes reveal that they were strongly reinforced early in life and are encouraged to devote their energies to sports [4]. Today with the changes in time and value the exceptional or disabled child needs psychological trait such as self confidence, self regard, self consistency and self respects in society, in fact disabled one ordinary people with special needs or who have very extra ordinary needs, but most of the time. It has been observed that the people with special needs under estimate their capabilities themselves because of psychological depression [5]. It is believes that human being are meant for some purpose, they are responsible for some specific task like enhance the status of their nation, contribute something for human beings etc. To perform these duties one must be physically, mentally, socially and spiritually sound. However, at the same time handicapped persons are not to be neglected. They are also coming under the categories of human being, lacking of any system are not to be proved that they keep isolated. They can also contribute their best for the nation and for the human being as well. In older days, up to the time of Second World War, most of the people and children who were physically disabled spend their lives at home or in hospitals; their capabilities were considered incapable members of society [6].

2. Objectives

The main objectives of the study were

1. To compare the personality traits between the visual-impaired sportsman and visual-impaired non-sportsman.
2. To compare the personality traits between the locomotors-impaired sportsman and locomotors-impaired non-sportsman.

3. Material and Methods

Twenty (20) each visual-impaired and locomotors-impaired persons among the physically challenged population, consisting of 10 each sportsman and non-sportsman were purposively selected as subjects of this study. All the subjects were belonging to different district's rehabilitation centers for physically challenged people of Manipur state. R.B. Cattell's 16 PF Questionnaire was administered to determine the personality traits among the visual-impaired and locomotors-impaired sportsman and non-sportsman. To find out the significant differences among the groups, 't' test statistical technique was employed and followed by Standard Ten (Sten) scores scale to determine the approximate position of the personality factors with respect to the population values.

4. Results

To determine the significance differences in 16PF between the visual-impaired sportsman and non-sportsman, the t-test was employed. The data analyses and means comparisons are presented in table 1.

Table-1: Means Comparisons of 16 PF Scores between Visual-impaired Sportsman and Visual-impaired Non-Sportsman

Factor	Sportsman	Non-Sportsman	t-test
	Mean±SD	Mean±SD	
A	6.40±1.43	6.00±0.82	0.77
B	4.00±2.26	4.90±0.99	1.15
C	9.70±1.06	10.40±1.17	1.40
E	9.90±1.45	10.20±1.55	0.45
F	9.30±2.00	10.60±1.17	1.71
G	6.90±1.45	7.90±1.29	1.63
H	10.90±1.45	10.70±2.63	0.21
I	7.80±1.14	8.20±1.55	0.66
L	8.10±0.88	7.50±1.08	1.36
M	9.10±1.97	9.00±1.83	0.12
N	7.40±1.58	7.60±1.43	0.30
O	9.50±1.58	9.40±1.71	0.14
Q1	6.40±2.22	7.40±1.35	1.22
Q2	7.70±1.49	6.80±1.55	1.32
Q3	7.10±0.88	8.00±1.70	1.49
Q4	9.20±1.75	9.80±1.48	0.83

*Significant at 0.05 level of confidence,

$$t_{0.05(18)}=2.101$$

Table 1 shows that there were insignificant differences of the mean scores between the visual-impaired sportsman and visual-impaired non-sportsman for all 16PF since the obtained values of 't' for factor A, B, C, E, F, G, H, I, L, M, N, O, Q1, Q2, Q3 and Q4 were 0.77, 1.15, 1.40, 0.45, 1.71, 1.63, 0.21, 0.66, 1.36, 0.12,

0.30, 0.14, 1.22, 1.32, 1.49 and 0.83 respectively are lesser than table value of 't' = 2.101 (p>0.05). The mean scores comparisons between visual-impaired sportsman and visual-impaired non-sportsman for all 16 primary personality factors are shown in figure 1.

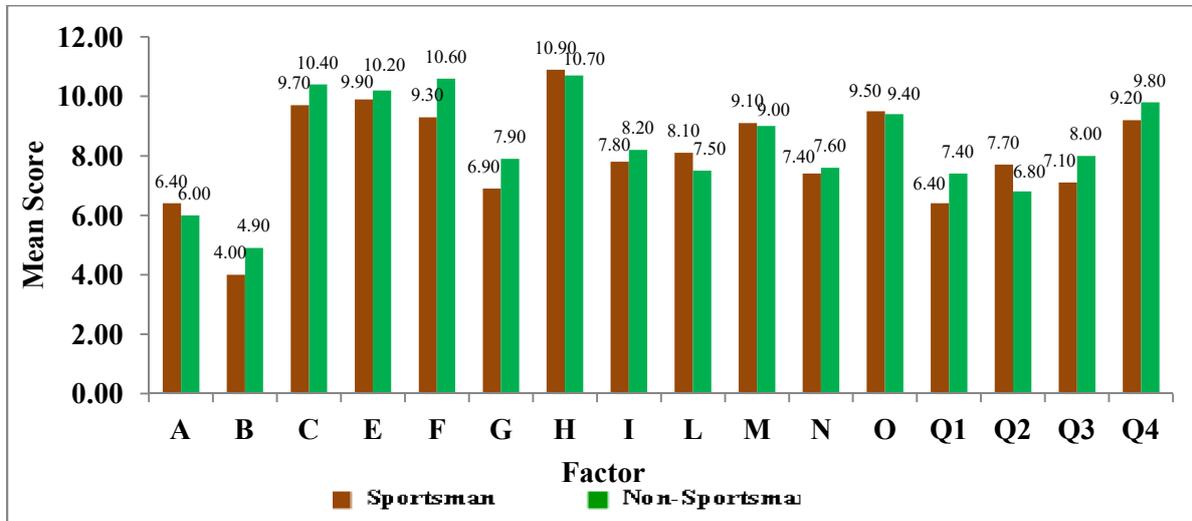


Figure 1: Means Comparisons of 16PF between Visual-impaired Sportsman and Visual-impaired Non-Sportsman.

To determine the significant differences of 16PF between the locomotor-impaired sportsman and locomotor-impaired non-sportsman, the comparison of means, standard deviations and t-test results are presented in table 2.

Table 2 shows that there were significant differences of the mean scores for factor A, E, F, H, I, L, O, Q2 and Q3 between the locomotor-impaired sportsman and locomotor-impaired non-sportsman since obtained values of 't'= 2.11,3.74, 3.21, 3.02, 2.92, 2.13, 2.67, 4.11 & 2.21 for factor A, E, F, H, I, L, O, Q2 & Q3 respectively are greater than table value of 't'=2.101 at 0.05 level of confidence (p<0.05). However, the mean scores of personality factors B, C, G, M, N, Q1 and Q4 were not significantly differed between locomotor-impaired sportsman and locomotor-impaired non-sportsman since the obtained values of 't' were lesser than table value of 't' (p>0.05). The mean score comparisons between the locomotor-impaired sportsman and locomotor-impaired non-sportsman are presented in figure 2.

Table 2: Means Comparisons of 16 PF Scores between Locomotor-impaired Sportsman and Locomotor-impaired Non-Sportsman

Factor	Sportsman	Non-Sportsman	t-test
	Mean±SD	Mean±SD	
A	7.40±1.17	5.80±2.10	2.11*
B	3.20±2.10	4.90±2.38	1.70
C	9.80±1.40	9.10±1.45	1.10
E	10.10±1.20	8.10±1.20	3.74*
F	10.50±1.43	8.20±1.75	3.21*
G	7.50±0.97	6.80±1.62	1.17
H	10.30±1.16	8.20±1.87	3.02*
I	7.90±1.45	6.30±0.95	2.92*
L	8.00±1.05	6.50±1.96	2.13*
M	9.20±1.32	7.90±1.91	1.77
N	6.40±1.08	6.30±1.49	0.17
O	9.70±1.06	7.90±1.85	2.67*
Q1	6.90±1.10	6.40±1.27	0.94
Q2	8.20±1.03	5.60±1.71	4.11*
Q3	7.70±1.49	6.10±1.73	2.21*
Q4	9.50±1.58	8.00±2.00	1.86

*Significant at 0.05 level of confidence, $t_{0.05(18)}=2.101$

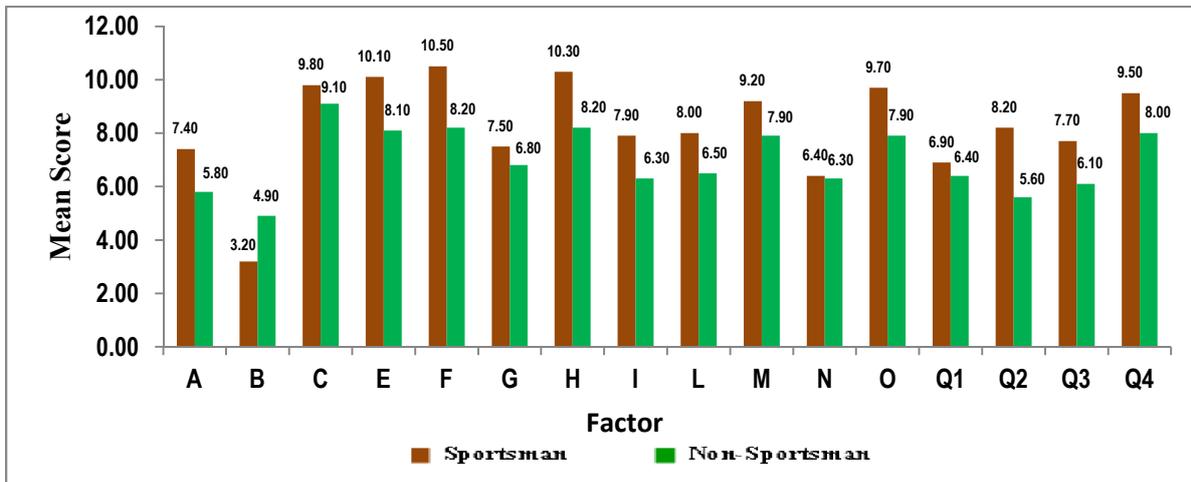


Figure 2: Means Comparisons of 16 PF between Locomotor-impaired Sportsman and Locomotor-impaired Non-Sportsman.

Sten Scores Analysis of 16 Personality Factors

The Sten scores (standard ten) are distributed over 10 equal-interval standard score points from 1 to 10 by taking population mean is fixed at 5.5 and standard deviation is 2.0 Sten scores. The Sten scores from 1 to 3 are considered as low, Sten scores from 4 to 7 are considered as average and the Sten scores from 8 to 10 are considered as high. The Sten scores of visual-impaired and locomotor-impaired sportsman and non-sportsman are shown in table 3 & 4, and their diagrammatic presentations are shown in figure 3 & 4 respectively.

The table 3 and its figure 3 clearly show that all the 16 personality factors- A, B, C, E, F, G, H, I, L, M, N, O, Q1, Q2, Q3 and Q4 between the visual-impaired sportsman and non-sportsman were found insignificant differences as the respective Sten scores- 6 & 6, 4 & 7, 6 & 6, 6 & 6, 6 & 6, 6 & 6, 6 & 6, 6 & 5, 6 & 6, 6 & 6, 6 & 5, 6 & 6, 6 & 5, 6 & 6, and 6 & 6 were falling at average scores (within 4 & 7) on the scale.

The table 4 and its figure 4 also clearly show that all the 16 personality factors- A, B, C, E, F, G, H, I, L, M, N, O, Q1, Q2, Q3 and Q4 between the locomotor-impaired sportsman and non-sportsman were found insignificant differences as the respective Sten scores- 6 & 5, 6 & 7, 6 & 5, 6 & 5, 6 & 6, 6 & 5, 6 & 5, 6 & 5, 6 & 5, 6 & 6, 6 & 6, 6 & 5, 6 & 5, 6 & 5, 6 & 5, and 6 & 5 were falling at average scores (within 4 & 7) on the scale.

The table 3 & 4 as well as figure 3 & 4 clearly interpreted that all the Sten scores of 16 PF were neither low nor high scores in the scale and no significant differences of personality characteristics between visual-impaired and locomotor-impaired sportsman and non-sportsman were shown at all.

5. Discussion

Sports are very important medium to keep our body fit and healthy as well as an important factor in the education. As the education, aims in the all-round development of mental, moral, social and physical development sports are indispensable in our life. ‘Use of sportive activities for rehabilitation and recreation of disabled children is now possible. Sport is becoming more common as a treatment complementary to conventional physical treatment methods. Work-out methods programmed in accordance with disability and age of disabled children can contribute to their social adaptation and psychological well-being’ (Kizar, et al.) [7].

The present study stressed to find out the significant differences of personality traits between the visual-impaired and locomotor-impaired sportsman and non-sportsman. In case of the visual impairment group, all the 16PF were found insignificant differences of the mean scores comparison (t-test) between visual-impaired sportsman and visual-impaired non-sportsman. However, in case of locomotor impairment, the personality factors A, E, F, H, I, L, O, Q2 & Q3 were found significant differences between the locomotor-impaired

sportsman and locomotor-impaired non-sportsman by mean scores comparison (t- test), but, no significant differences were for the personality factors- B, C, G, M, N, Q1 and Q4. Whereas, under the Sten scores (standard ten) analyses, no significant differences were found

for both the visual impairment and locomotor impairment groups between the sportsman and non-sportsman as the personality characteristics of all 16 PF were falling at the average (4-7) in the scale of Sten scores.

Table 3: Mean Sten Scores of Visual-impaired Sportsman vs Non-sportsman

Factor	Low Score Description	Standard Ten Scores										High score description
		Low			Average				High			
		1	2	3	4	5	6	7	8	9	10	
A	<i>Cool, reserved, impersonal, formal, aloof, detached, (Sizothymial)</i>	.	.	.	.	.	.	.	.	.	.	<i>Warm, outgoing, kindly, easy-going, participating, likes people (Affectothymia)</i>
B	<i>Concrete-thinking, Less intelligent (Lower scholastic mental capacity)</i>	.	.	.	.	.	.	.	.	.	.	<i>Abstract-thinking, more intelligent, bright (Higher scholastic mental capacity)</i>
C	<i>Affected by Feelings, emotionally less stable, easily annoyed (Lower ego strength)</i>	.	.	.	.	.	.	.	.	.	.	<i>Emotionally stable, mature, faces reality, calm (Higher ego strength)</i>
E	<i>Submissive, humble, mild, easily led, accommodating (Submissiveness)</i>	.	.	.	.	.	.	.	.	.	.	<i>Dominant, assertive, aggressive, stubborn, competitive, bossy (Dominance)</i>
F	<i>Sober, restrained, prudent, taciturn,, serious (Desurgency)</i>	.	.	.	.	.	.	.	.	.	.	<i>Enthusiastic, spontaneous, heedless, expressive, cheerful (Surgency)</i>
G	<i>Expedient, disregards rules, self-indulgent (Weaker-superego strength)</i>	.	.	.	.	.	.	.	.	.	.	<i>Conscientious, conforming, moralistic, staid, rule-bound (Stronger superego strength)</i>
H	<i>Shy, threat-sensitive, timid, hesitant, intimidated (Threctia)</i>	.	.	.	.	.	.	.	.	.	.	<i>Bold, venturesome, uninhibited, can take stress (Parmia)</i>
I	<i>Tough-minded, self-reliant, no-nonsense, rough, realistic (Harria)</i>	.	.	.	.	.	.	.	.	.	.	<i>Tender-minded, sensitive, overprotected, intuitive, refined (Premsia)</i>
L	<i>Trusting, accepting conditions, easy to get on with (Alaxia)</i>	.	.	.	.	.	.	.	.	.	.	<i>Suspicious, hard to fool, distrustful, skeptical (Protension)</i>
M	<i>Practical, concerned with down-to-earth, issues, steady (Praxernia)</i>	.	.	.	.	.	.	.	.	.	.	<i>Imaginative, absent-minded, absorbed in thought, impractical (Autia)</i>
N	<i>Fortnight, unpretentious, open, genuine, artless (Artless)</i>	.	.	.	.	.	.	.	.	.	.	<i>Shrewd, polished, socially aware, diplomatic, calculating (Shrewdness)</i>
O	<i>Self-assured, secure, feels free of guilt, untroubled, self-satisfied (Untroubled adequacy)</i>	.	.	.	.	.	.	.	.	.	.	<i>Apprehensive, self-blaming, guilt-prone, insecure, worrying (Guilt Proneness)</i>
Q1	<i>Conservative, respecting traditional ideas (Conservation of temperament)</i>	.	.	.	.	.	.	.	.	.	.	<i>Experimenting, liberal, critical, open to change (Radicalism)</i>
Q2	<i>Group-oriented, a joiner and sound follower, listens to others (Group Adherence)</i>	.	.	.	.	.	.	.	.	.	.	<i>Self-sufficient, resourceful, prefers, own decisions (Self-sufficiency)</i>
Q3	<i>Undisciplined self-conflict, lax, careless of social rules (Low integration)</i>	.	.	.	.	.	.	.	.	.	.	<i>Following self-image, socially precise, compulsive (High self-concept control)</i>
Q4	<i>Relaxed, tranquil, composed, has low drive, un-frustrated (Low ergic tension)</i>	.	.	.	.	.	.	.	.	.	.	<i>Tense, frustrated, overwrought, has high drive (High ergic tension)</i>

Fig. 3: Sportsman: Non-Sportsman:



Table 4: Mean Sten Scores of Locomotor-impaired Sportsman vs Non-sportsman

Factor	Low Score Description	Standard Ten Scores										High score description			
		Low			Average				High						
		1	2	3	4	5	6	7	8	9	10				
A	<i>Cool, reserved, impersonal, formal, aloof, detached, (Sizothymial)</i>	<i>Warm, outgoing, kindly, easy-going, participating, likes people (Affectothymia)</i>
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H	<i>Shy, threat-sensitive, timid, hesitant, intimidated (Threctia)</i>	<i>Bold, venturesome, uninhibited, can take stress (Parmia)</i>
I	<i>Tough-minded, self-reliant, non-nonsense, rough, realistic (Harria)</i>	<i>Tender-minded, sensitive, overprotected, intuitive, refined (Premsia)</i>
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M	<i>Practical, concerned with down-to-earth, issues, steady (Praxernia)</i>	<i>Imaginative, absent-minded, absorbed in thought, impractical (Autia)</i>
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Q4	<i>Relaxed, tranquil, composed, has low drive, un-frustrated (Low ergic tension)</i>	<i>Tense, frustrated, overwrought, has high drive (High ergic tension)</i>

Fig. 3: Sportsman: Non-Sportsman:

6. Conclusion

The present study suggest that there is the positive impact of sports participation among the visual-impaired and locomotor-impaired population and they could develop the different personality traits to expose themselves among the normal people. Among the visual impairment and locomotor impairment people, there is the average level of personality that can be improved through the participation of sports and games. Regular practice and organization of games and sports activities for the physically

challenged population are mandatory to achieve the quality of life and standard of living among the normal people in the society.

7. Acknowledgement

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INNOVATIVE PEDAGOGICAL PRACTICES- INTEGRATED LEARNING APPROACH IN SPORTS AND PHYSICAL EDUCATION

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ABSTRACT

Pedagogy means different approach in theory and practice of learning, and how this process is influenced by, the social, political and psychological development of learners. It is the study of how knowledge and skills are bestowed in an educational context, and considers the interactions during learning. The different pedagogical approaches are: behaviourism, constructivism, social constructivism, and liberationist. A behaviourist pedagogical approach would say learning is teacher centred. Constructivism is a theory that people learn through experiences and reflection. A Social constructivism pedagogy could be combination of two priorities: teacher guided, and student centred and liberationist approach teacher act as a learner and the whole class discovering subjects together. Integration means coordination of different activities to ensure harmonious functioning. There are different approaches of integration A) Multidisciplinary: In this approach focus is totally on the disciplines. B) Fusion: during multidisciplinary approach, lecturers fuse skills, knowledge, or maybe attitudes into the regular college programme. C) Transdisciplinary: In the transdisciplinary approach to integration, lecturers organize information around student queries and considerations.

Key word: Pedagogy, Integration, Multidisciplinary, Fusion, Transdisciplinary.

Pedagogy means different approach to teaching. It is the theory and practice of learning, and how this process influenced by, the social, political and psychological development of learners. Pedagogy, taken as an academic discipline. It is the study of how knowledge and skills are bestowed in an educational context, and it considers the interactions that take place during learning. Both the theory and practice of pedagogy vary greatly, as they reflect different social, political, and cultural contexts. Pedagogy is also described as the act of teaching. The pedagogy is practiced by teachers to shape their actions, judgments, and other teaching strategies. While practicing pedagogical strategies teacher takes into consideration theories of learning, understandings of students and their needs, and the backgrounds and interests of individual students.

Integrative learning is an approach where the learner brings together prior knowledge and experiences to support new knowledge and experiences. After gaining new knowledge, learners use their skills and apply them to new experiences at a more complex level.

What are the pedagogical approaches?

The different pedagogical approaches could be broken down into four categories:

behaviourism, constructivism, social constructivism, and liberationist.

1. Behaviourism

A behaviourist pedagogy uses the theory of behaviourism to inform its approach. A behaviourist pedagogical approach would say learning is teacher centred. It would advocate the use of direct instruction, and lecture-based lessons. In a lesson using a behaviourist pedagogical approach, you could expect to see a mixture of lecturing, modelling and demonstration, role learning, and choral repetition. All of these activities are 'visible' and structured, as well as being led by the teacher. However, during the course of the lesson, the shift may come where the student is the centre of the activity, and demonstrates their learning. Behaviourism is also described as a traditional teaching style.

2. Constructivism

Constructivism is a theory that people learn through experiences and reflection. In constructivist pedagogy the child is at the centre of the learning. it is also called 'invisible pedagogy'. A constructivist approach would link project work, inquiry-based learning, and sometimes adopt a Montessori or Steiner method.

In this method teacher-student talk is very less. It includes individualisation, a slower pace, hidden outcomes and the mantle of the expert. Some practitioners of this pedagogy would also emphasis on being outdoors, and engaging with nature. Constructivism is also defined as a progressive teaching style.

3. Social constructivism

A Social constructivism pedagogy could be combination of two priorities: teacher guided, and student centred. Cognitive psychologist, Lev Vygotsky developed social constructivism, building on the work of Piaget, but argued against the ideas of Piaget that learning could only happen in its social context, and believed that learning was a collaborative process between student and teacher. The teacher would use group work elements, but would use smaller group sizes, and limit the choice in topics. The teacher also uses teacher modelling, questioning, and a mixture of individual, pair, and whole class instruction.

4. Liberationism

Liberationism is a critical pedagogy developed by the Brazilian educator, Paulo Freire. Freire was the Director of the Department of Education, and developed an approach of teaching where he was able to teach illiterate adults to read in just 45 days. A liberationist approach is one where the student voice is placed at the centre, and a democracy is put into the classroom. In this method teacher act as a learner and the whole class discovering subjects together. Student may take on the role of the teacher, and decide the topic of the lesson. The teacher also provides space and opportunities to the students to showcase their learning. Learning can happen in the form of a performance, speech, or dance etc.

Integrative learning

Integrative learning is a learning theory which describes a movement toward integrated lessons. It helps students to make connections across curricula. Integrated studies bring together traditionally separate subjects so that students can grasp a more authentic knowledge.

What is Integrated Learning?

Integrated learning programs area unit operated on the \$64000 world scenario, adult's area unit requested to demonstrate tasks and perform skills that aren't outlined in a very single educational discipline. rather than merging or mixing subjects, productive voters would be benefited from being comfy with the runniness of information and skills. The human brain naturally appearance for connections between ideas and learn best after we establish such connections, learning became spirited and gratifying. during this lightweight of that reality, integrated learning breaks down those boundaries between science, social studies, and language arts, and rather than integration the abilities and data outlined at intervals those disciplines into one theme centred approach that explores learning concerning our world. academics of the integrated programs produce lessons and activities that have interaction students in lessons, projects, and different learning tasks that specialise in the connections between the abilities and content educated within the regular course of study.

Integrated teaching-learning

Definition:

Integration (from the Latin *integer* = whole) means coordination of different activities to ensure harmonious functioning.

Integration of teaching is defined as the organization of teaching matter to interrelate or unify the subjects which are frequently taught in separate academic courses or departments. It simply means bridging connections between academic knowledge and practical.

These definitions explain that the result of harmonious functioning will have positive effects in today's materialistic world. Effectiveness is a key to progress. In the agricultural nations it is the way to endurance. Neither the idea nor the word is new. At present both are fashionable and, as is often the case in such situations, infatuation and passion are more in evidence than logical analysis and objective appraisal. Such things are used, abused, transformed and deformed.

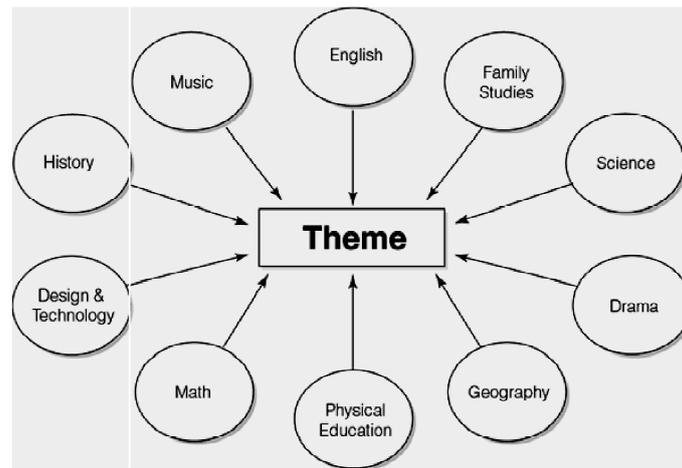
We are involved here with the which means of integration within the field of skilled education and coaching. To paraphrase the definition given higher than, integration during this field

is “the coordination of various teaching activities to confirm the harmonious functioning of the academic method for more practical health work force development”. There are different approaches to integration. They are mentioned below.

Multidisciplinary approach

Multidisciplinary approaches focus totally on the disciplines. lecturers WHO use this approach organize standards from the

disciplines around a topic. within the figure below shows the link of various subjects to every different and to a typical theme. There are many various ways that to form multidisciplinary program, and that they tend to take issue within the level of intensity of the mixing effort. the subsequent descriptions define completely different approaches to the multidisciplinary perspective.



Intradisciplinary Approach:

once lecturers integrate the subdisciplines among an issue space, they are victimisation associate degree intradisciplinary approach. desegregation reading, writing, and voice communication in language arts may be a common example. Lecturers typically integrate history, geography, economics, associate degreed government in an intradisciplinary social studies program. Integrated science integrates the views of subdisciplines like biology, chemistry, physics, and earth/space science.

Fusion: during this multidisciplinary approach, lecturers fuse skills, knowledge, or maybe attitudes into the regular college programme. In some faculties, as an example, students learn respect for the surroundings in each subject. Fusion will involve basic skills. many colleges emphasize positive work habits in every subject. Educators will fuse technology across the programme with pc skills integrated into each subject. Acquirement across the programme is another example of fusion.

Service Learning: Service learning that involves community comes that occur

throughout category time falls beneath the class of multidisciplinary integration. Learning Centres/Parallel Disciplines. a preferred thanks to integrate the programme is to deal with a subject or theme through the lenses of many totally different subject areas. In Associate in Nursing elementary room, students usually expertise this approach at learning centres. as an example, for a topic like “patterns,” every learning centre has Associate in Nursing activity that permits the scholars to explore patterns from the attitude of 1 discipline—math, language, science, or social studies. As students move through the educational centres to complete the activities, they find out about the conception of patterns through the lenses of assorted disciplines.

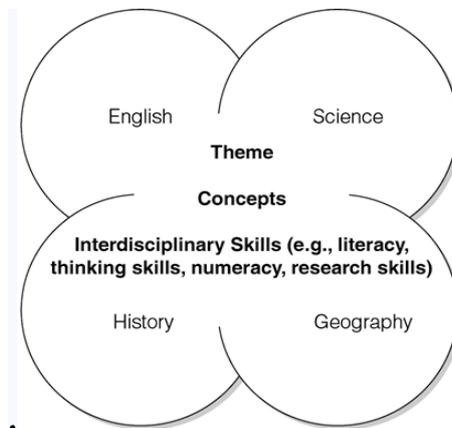
Theme-Based Units: Some educators transcend sequencing content and set up collaboratively for a multidisciplinary unit. Educators outline this a lot of intensive manner of operating with a topic as “theme-based.” usually 3 or a lot of subject area, unites are concerned within the study, and therefore the unit ends with Associate in Nursing integrated culminating activity. Units of

many weeks' period could emerge from this method, and therefore the whole college is also concerned.

Interdisciplinary Integration

In this approach to integration, lecturers organize the programme around common learnings across disciplines. They chunk

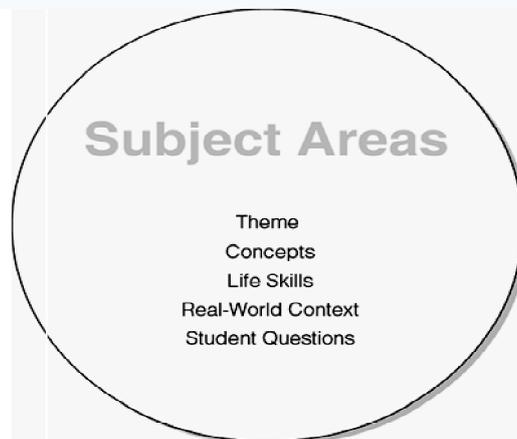
along the common learnings embedded within the disciplines to emphasise knowledge domain skills and ideas. The disciplines area unit classifiable, however they assume less importance than within the multidisciplinary approach. within the figure below illustrates the knowledge domain approach



Transdisciplinary Integration

In the transdisciplinary approach to integration, lecturers organize information around student queries and considerations. Students develop life skills as they apply knowledge

base and disciplinary skills during a real-life context. 2 routes result in transdisciplinary integration: project-based learning and negotiating the information.



Project-Based Learning

In project-based learning, students tackle a local problem. Some schools call this problem-based learning or place-based learning. According to Chard (1998), planning project-based curriculum involves three steps:

1. Teachers and students choose a subject of study supported student interests, syllabus standards, and native resources.

2. The teacher finds out what the scholars already understand and helps them generate inquiries to explore. The teacher conjointly provides resources for college kids and opportunities to figure within the field.
3. Students share their work with others in a very culminating activity. Students show the results of their exploration and review and value the project. Studies of project-based programs show that students go so

much on the far side the minimum effort, build connections among totally different subject areas to answer open-ended queries, retain what they need learned, apply learning to real-life issues, have fewer

discipline issues, and have lower absence (Curtis, 2002).
 Comparing and Contrasting the Three Approaches to Integration

	Multidisciplinary	Interdisciplinary	Transdisciplinary
Organizing Center	Standards of the disciplines organized around a theme	Interdisciplinary skills and concepts embedded in disciplinary standards	Real-life context Student questions
Conception of Knowledge	Knowledge best learned through the structure of the disciplines A right answer One truth	Disciplines connected by common concepts and skills Knowledge considered to be socially constructed Many right answers	All knowledge interconnected and interdependent Many right answers Knowledge considered to be indeterminate and ambiguous
Role of Disciplines	Procedures of discipline considered most important Distinct skills and concepts of discipline taught	Interdisciplinary skills and concepts stressed	Disciplines identified if desired, but real-life context emphasized
Role of Teacher	Facilitator Specialist	Facilitator Specialist/generalist	Coplaner Colearner Generalist/specialist
Starting Place	Disciplinary standards and-procedures	Interdisciplinary bridge KNOW/DO/BE	Student questions and concerns Real-world context
Degree of Integration	Moderate	Medium/intense	Paradigm shift
Assessment	Discipline-based	Interdisciplinary skills/concepts stressed	Interdisciplinary skills/concepts stressed
KNOW?	Concepts and essential understandings across disciplines	Concepts and essential understandings across disciplines	Concepts and essential understandings across disciplines
DO?	Disciplinary skills as the focal point Interdisciplinary skills also included	Interdisciplinary skills as the focal point Disciplinary skills also included	Interdisciplinary skills and disciplinary skills applied in a real-life context
BE?	Democratic values Character education Habits of mind Life skills (e.g., teamwork, self-responsibility)		
Planning Process	Backward design Standards-based Alignment of instruction, standards, and assessment		
Instruction	Constructivist approach Inquiry Experiential learning Personal relevance Student choice Differentiated instruction		
Assessment	Balance of traditional and authentic assessments Culminating activity that integrates disciplines taught		

Benefits of Integrated Learning

- Using academic theory in the real world.
- Developing self-awareness.
- Working out of their comfort zone.
- Developing awareness of global challenges and industry issues.
- Gaining leadership, teamwork and communication skills.
- Developing practical skills.
- Transitioning between school and the job market.

Conclusion

Integrated learning helps universities, employers and NGOs work nearer by improving relationships that equip students with the abilities and information needed to reach competitive job markets. It helps to build relationships between students, universities and employers, wherever recent graduates will have the impact they really need to possess, rather than simply change of integrity a force for the sake of it.

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COMPARATIVE STUDY OF SPEED VARIABLE OF GOVERNMENT SCHOOL GIRLS AND PRIVATE SCHOOL GIRLS IN RAJASTHAN

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ABSTRACT

In the present study, an attempt has been made to compare speed component among private school girls and government school girls. The study was carried out on 600 girl students in the age group of 10-16 years, from private school girls (N=300) and government school girls (N=300). The subjects were school students of Jaipur District. The data was collected by use of AAHPER Youth Fitness Test. The data was analyzed and compared with the help of statistical procedures in which arithmetic mean, standard deviation (S.D.), t-test were employed. There were no significant differences of speed between private school girls and government school girls.

Keywords: Physical fitness, Speed, AAHPER Fitness test.

Introduction

Physical Fitness is an important as the man himself. By physical fitness, we mean fitness is terms of health and skill based performance. A person can be said to be physically fit if he has the ability to perform physical activities which required strength, flexibility or Endurance. In this fast pacing life, everyone has a very hectic schedule. A person does not get much time for himself. But if one wants to stay health and fit, he must make regular exercise a part of his life. One must schedule at least 30 minute for physical activity, physical fitness can be achieved through the need of exercise, correct nutrition and proper amount of rest. People that does not get enough of physical activity or exercise will quickly put on weight and became fat vary soon. Thus results in joining weight loss program later on exercise helps in a very healthy way to make a person stay healthy way to make a person stay healthy and happy line longer. It also helps in chances of various kind

of disease.

Speed: the ability to propel the body or a part of the body rapidly from one point to another. Examples of activities that require good speed for success are soccer, basketball, stealing a base in baseball, and sprints in track.

Materials and Methodology

In this current study, a sample of 600 girls students ranging between 10 to 16 years studying in different high schools from Government and private (600 girls students) area of Jaipur was taken as subjects for this study. AAPER Youth Physical Fitness Test Battery (1976) was used to measure Physical Fitness Status (speed) of the subjects. The test battery consist one test items: 50m dash. To compare of speed between private school girls and gov. school girls used the t-test and graphical representation of the data. The level of significance chosen was .05.

Descriptive Statistics of 50m dash
Table no.-1: Mean and s.d. of 50m dash

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
Speed	Private	300	11.11	1.11	.06
	Gov	300	10.26	.94	.05

Table no.1 indicates the values of descriptive statistics of the private group and government group for 50m dash, which shows that the

mean and S.D. values of Private Group and Government Group are found to be 11.11, 10.26 and 1.11, .94 respectively.

Table no.-2: Comparison of shuttle run between government school girls and private school girls

	F-value	Sig.	T	Sig. (2-tailed)
Speed	18.097	.000	10.213	.000

Table no.2 indicates the values test of difference between the subject effects, which shows that there are a no significant difference in private and government groups of 50m dash,

as the F-value has founded to be 18.097 and the t-value has founded to be 10.213, which is not significant at 0.05 level.

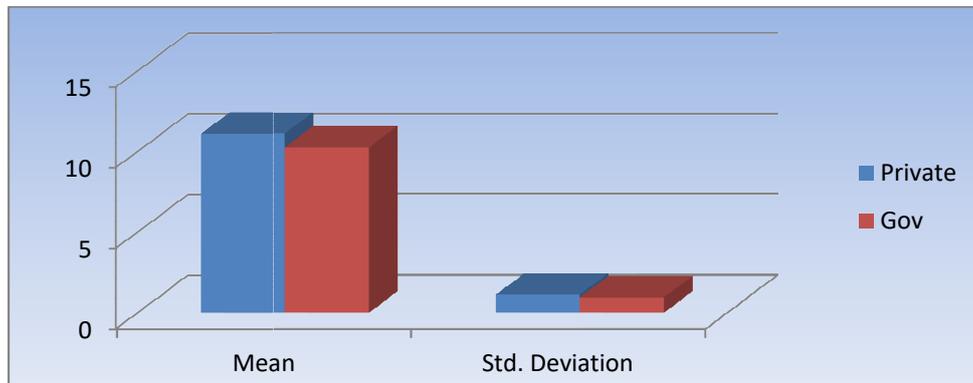


Figure no.1- Graphical Representation of 50m dash(in Sec.)

Results and Discussion

The data collected by adopting above procedure were statistically analyzed. The results are presented in the following tables. For testing the significance in 50m dash, the level of significance chosen was .05. The Comparison between private school girls students and government school girls students of Jaipur. The data pertaining to the same is presented in Table 1.

Discussion

There are no significant differences between

physical fitness variable speed. After finishing research Researcher found that keeping the government school girl students was similar speed level than private school girl students.

Conclusions

In the light of the findings and limitations of the present study the following conclusions were drawn: There were no significant differences obtained on speed between Government school girl students and private school girl students.

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NON-COGNITIVE FACTORS AS CORRELATES OF ACADEMIC SELF-CONCEPT**A. Agarwal¹ and B. Arya*²**^{1,2}Manipal University Jaipur, Rajasthan, India¹abhilasha.icg@gmail.com, ²bhavana.jaipur@gmail.com**ABSTRACT**

The purpose of the current study was to assess how non-cognitive factors namely grit, self-control and locus of control affects academic self-concept in undergraduate students and what is the relationship between non cognitive factors and academic self-concept. A sample of 125 undergraduate students from various academic fields ranging from arts and law, engineering and science, management and commerce etc. were taken. The sample had 58.9% female participants whereas the male participants accounted for 41.1%. Grit Scale (Duckworth, Peterson, Matthews, & Kelly, 2007), Self-control Scale (Tangney, Baumeister, et al. 2004), Locus of control Scale (Rotter, Julian, 1966) and the Academic self-concept scale (Reynolds, 1988) were used to assess the variables in this study. The results confirmed that grit, self-control and locus of control are positively correlated with academic self-concept.

Keywords: Academic Self Concept, Non-Cognitive Factors, Grit

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Introduction**Importance of Academics**

There has been observed an exponential growth in the importance of academics in the past decades. Academic success is crucial because it plays a direct role in deciding the positive outcomes of the students after graduating.

There are various determinants of academic success. Demographic factors like socio-economic status and experiences of students, the structural features and environment of the institution i.e., schools, colleges and universities, the relationship of the students with their teachers and peers, the student's awareness about his/her learning environment so that they can fully utilize the resources available to them, and lastly, the achievement attitudes of students during their study period at college are some of the important factors which play an important role in academic success. Other factors that influence academic success are namely the intellectual capabilities of the students, motivation of the students, student and parent interaction, parent's expectations, teaching quality, student's physical and mental health etc.

What is academic self-concept?

Before defining academic self-concept, we need to develop an understanding of self-concept. Self-concept can be defined as attitudes, feelings, perceptions and evaluations of self and a subjective evaluation of perceived strengths and weaknesses of the self. Self-

concept has three components: self-image, self-esteem and the ideal self. Self-image can be defined as the way we see ourselves. It includes a self-knowledge of physical attributes (e.g. fat, tall, pale skin, blue eyes), our social roles (e.g. father, daughter, teacher, uncle), and our personality characteristics (e.g. introvert, amiable, selfish, egoistic). Self-esteem refers to the self-evaluation and associated feelings of our own worth. Self-esteem is a crucial aspect of self-development as evaluations of our own abilities affect our emotional experiences and future behavior and attitudes. High self-esteem indicated a realistic understanding of the self's competencies and abilities, along with an attitude of self-respect and self-acceptance, whereas low self-esteem denotes an unrealistic perception of the self's competencies by the individual. General self-esteem includes academic competence, social competence, physical/athletic competence and physical appearance.

The ideal self refers to the self we wish to be like. It has often been observed that there is a difference between one's self-image and one's ideal self. This incongruity can negatively impact one's self-esteem.

Academic self-concept is an individual's perception about their abilities and aptitude in a given academic field. The construct of academic self-concept has gained importance in educational research over few decades. Wigfield & Karpathian (1991) suggest that academic self-concept refers to an individual's

perception of self in academic achievement situations. Academic self-concept is self-perceived ability developed through effort and desirable academic interactions (Valentine et al, 2004).

In general, academic self-concept is a psychological construct that refers to an individual's belief about his/her academic abilities in a particular academic field (e.g., mathematics). Along with a cognitive component, academic self-concept also has a motivational and affective component (Marsh, 1999). Academic self-concept is a relatively new term in the field of psychology. Self-concept has been consistently linked with academic performance/outcomes as it is believed to influence future academic motivation. There has also been a significant relation between academic self-concept and motivation, as individuals who have trust and faith in their academic capabilities are more likely to be motivated to perform better in academics as compared to those who have poor academic self-concept. Academic self-concept is a good predictor of academic success. Academic self-concept differs from global self-concept as it refers to the judgement and overall impression of one's competencies/abilities in the academic domain such as mathematics, literature and so on.

Cognitive factors related to academics

Cognitive factors have always dominated in the field of academics. This domination is clearly visible if you evaluate the traditional intelligence tests developed by Wechsler and Alfred Binet. Traditional tests devised for measuring academic performance and academic success focused solely on cognitive factors and disregarded the importance of non-cognitive factors. While it is certainly true that cognitive factors are major predictor and indicator of academic performance, they are not the only factors affecting academic performance.

Non-cognitive factors related to academics

Over the past few decades, non-cognitive factors have extensively dominated in the field of academics and have gained much importance in the sphere of education. Researchers were curious so as to study the

relationship between non-cognitive factors and academic performance. More and more educational institutions are focusing not only on cognitive factors but also non-cognitive factors as an important predictor of academic success and achievement. The development of non-cognitive skills is complex and thus assessing these skills within individuals is even more complex and hard.

Non-cognitive factors related to academic performance involves grit, self-concept, locus of control, realistic self-appraisal, gratification delay, interest, achievement motivation and so on. Various models have been developed to create an understanding of the relationship between non-cognitive factors and academic performance. The most common of these is the model put forth by the researchers at the CCSR. This model states that students form academic mindsets i.e., beliefs on one's own abilities and capabilities in the academic sphere which in turn affects motivation, behavior and performances in either positive or negative way. Academic mindsets are in turn shaped by social skills, academic perseverance and learning strategies. Thus, to develop a positive academic mindset, one must feel connected with the academic community, should not discourage from failures and setbacks but must instead consistently work hard to achieve their goals, effectively utilize the learning tools and must have value for academic work. Academic mindset thus shapes academic behaviors which include student actions such as going to class, listening attentively to the teacher, doing homework, clearing doubts etc. These behaviors can be easily monitored. Academic behavior is an important component as non-cognitive factors influence academic performance by working through academic behaviors. Thus, the model illustrates that once we form academic mindsets through the process of social skills, academic perseverance and learning strategies, these are manifested as academic behaviors which thus in turn influence academic performance and academic success.

Grit

Grit also known as perseverance, tenacity refers to the passion for long-term goals and working strenuously towards your goal even in the face of obstacles. Duckworth et al. (2007)

defines grit as the “perseverance and passion for long-term goals” and states that it involves “working strenuously towards challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress.” Stamina is important in grit. A “gritty” individual treats success and achievement as a marathon, rather than a sprint.

The term grit was thrust into the academic realm, thanks in large part to the groundbreaking research by Dr. Angela Duckworth of the University of Pennsylvania. Her study reported that there was little correlation between grit and intelligence, but that grittier individuals had attained higher degree of education as compared to less gritty individuals of the same age, grittier individuals had made fewer major career changes as compared to their low gritty peers of the same age range and that grittier individuals had higher retention power and thus scored better in traditional SATs and CGPAs. She and her colleagues also found out that ‘gritty’ behavior does not vary much with gender; however, some studies did find out that generally females tend to be grittier as compared with their male counterparts. Others were able to find that grit is a predictor for psychological well-being.

It has been found that ‘gritty’ individuals not only tend to excel academically but also overall in life. They see setbacks and failures as lessons to be learned and do not give up in the face of trouble. They consistently achieve for their goals and do not find gratification in short-term achievements. Several studies in the past have shown IQ as a primary indicator of achievement but recent studies have shown that grit has been found to be a better indicator of achievement than IQ alone in sample of people working under strenuous tasks such as the cadets at the United States Military academy. Angela Duckworth has also studied the relationship between grit and self-control and found out that individuals who are gritty tend to be more self-controlled but the correlation is not perfect.

Self-control

Self-control has been defined as the ability to delay immediate gratification of a smaller

reward for a larger reward later in time (Ainslie, 1975; Mischel et al., 1989; Kirby and Herrnstein, 1995). This definition includes the effortful inhibition notion, but is extended in the sense that it emphasizes the self-control dilemma or conflict between a short-term, immediately gratifying option (that needs to be inhibited) and a long-term option with a larger reward value. Self-control refers to the delay of gratification of smaller rewards for long-term rewards. It is the ability to regulate one’s emotions, thoughts and feelings in the face of temptation and not to give in to the urges/desires.

On the whole self-concept is an important predictor of success. It is an aspect of the inhibitory control. It is an important characteristic because it helps in the attainment of goals in the long-term. Researches have shown that people who exercise self-control not only achieve their goals but are also likely to have strong willpower and high self-esteem in comparison to those who do not have self-control.

Self-control is an important indicator of academic success as individuals who exhibited self-discipline and self-regulation had better grades than those who did not exercise self-control. One long-term study had found that individuals who had high level of self-control during childhood, continued to have high levels of physical and mental health in adulthood. Nearly all students experience conflict regarding their academic goals at some point in their life. Students who exhibit high self-control tend to readily overcome such conflicts regarding their academic goals as they align their thoughts, attitudes and feelings in a uniform direction, maintaining control over them and utilize them in a positive manner. Individuals possessing self-control learn to model their impulses. They learn to steer their emotions rather than their emotions taking control of them. They tend to be self-disciplined and self-reliant. It is only natural that individuals who have self-control to perform well academically as they have trust in their academic capabilities and thus learn to regulate themselves accordingly. Researches have also found out that self-control is limited resource and that practicing self-control in the long run helps in strengthening it. However,

self-control in short-term is limited. This can be elucidated by the fact that if you use all your self-control on a specific task than it becomes harder for you to exercise self-control over other things throughout the day. Psychologists refer to this as ego-depletion i.e., when you use all your will-power on one task, it becomes impossible to muster self-control over any other task.

Locus of control

Rotter (1990) describes the internal locus of control as: 'the degree to which persons expect that reinforcement or an outcome of their behavior is contingent on their own behavior or personal characteristics'. Locus of control refers to the extent to which people believe that they have control over their life outcomes and events. Furthermore, it is of two types i.e., internal locus of control and external locus of control. Those who are high on internal locus of control tend to strongly believe that they have full control over their life outcomes. They attribute themselves for their success and failures in life. On the other hand, individuals who are high on external locus of control tend to strongly believe that they do not have any control over their life outcomes and tend to believe in fate, coincidence etc. They attribute other individuals or environmental factors for their success and failures in life.

In 1966, Rotter designed and published a scale for accessing and measuring internal and external locus of control. The scale had a forced choice between two alternatives i.e., 'a' and 'b', where individuals had to choose one out of the two options. While the scale was widely used for assessing the locus of control, many argued that one simplistic scale couldn't fully comprehend locus of control. It is very important to note that locus of control is a continuum and that no individual has 100 per cent internal locus of control or external locus of control. Instead, it is a continuum and most people lie in between both. While those having internal LOC are more likely to take responsibility for their actions, those having external LOC are more likely to blame outside forces for their circumstances. Individuals with internal LOC tend to be less influenced by the opinions of others; those with external LOC are more likely to be influenced by the opinions of others. Thus, locus of control can have a major

impact on an individual's life, and decides how individuals cope up with stress.

Review of Literature

Over the past decade, many researchers have tried to explore the relationship between non-cognitive factors and academic self-concept. Previous researches have also demonstrated academic self-concept as a reliable predictor of academic success and academic achievement. The impact of non-cognitive factors on academic self-concept is a rather a new domain of interest that is being explored by educationists and psychologists in the recent years. Huang (2011), in a meta-analysis of 39 studies (independent and longitudinal) indicated that positive self-concept is directly associated with improved academic performance and academic achievement. Thus, his study clearly indicates that there is a significant positive correlation between self-concept and academic achievement. An individual who has a clear concept of his self is more likely to perform well academically and thus results in academic success. Ghazvini (2011) studied the relationship between academic self-concept and academic performance. The sample consisted of 363 students from 10 different schools which were selected with the help of multistage cluster sampling method. The result showed that there is significant positive correlation between academic self-concept and academic performance i.e., individuals who have a positive academic self-concept are more likely to have positive academic performance and thus achieve academic success. Saadat, Ghasemzadeh, Karami, & Soleimani (2012), an increased level of internal locus of control will lead people to think that they hold control over their life events and outcomes and thus they will learn to place more value on their abilities and skills and will have faith in their capabilities and not blame external situations and other individuals for their failures and setbacks. The sample comprised 370 Iranian university students. Thus internal locus of control predicts self-esteem. On the other hand, individuals with an increased level of external locus of control will tend to blame their failures onto other individuals and external environment. Duckworth and Gross (2014),

pointed that there is a strong correlation between grit self-control. Consequently, individuals with high level of self-control are also likely to exhibit high level of perseverance and are passionate to work for long-term goals. Their ability to regulate attention and resist temptations helps them to work persistently. Celik and Saricam (2018) found out that there is a positive correlation between positive thinking skills and grit i.e., optimistic individuals are more likely to exhibit 'gritty' attitude and those who have a 'gritty' personality are likely to think positively. Wanzer, Postlewaite and Zargarpour (2019), studied the relationship between non-cognitive factors and academic performance. The study was conducted to test the model put forth by the researchers at the Chicago Consortium for School Research. The study indicates that there is a positive relationship between non-cognitive factors and academic performance. Non-cognitive factors comprised academic mindsets which included social skills, academic perseverance and learning strategies which in turn give rise to academic behaviors which in turn influences academic performance.

Methodology Current Research

This particular study has been done to assess the association between non-cognitive factors i.e., grit, self-control, locus of control and academic self-concept. There has been emergence of a number of studies in the past decade that point out that people who have high grit also tend to have high self-control and vice versa, resulting in a positive academic self-concept. Also there exist researches which link non-cognitive factors to academic performance which in turn predicts positive life outcome. Thus, this particular study was conducted to shed light on the importance of non-cognitive factors on an individual's academic performance. The current research was conducted to study the relationship between grit, self-control, locus of control and academic self-concept in undergraduate students.

Hypotheses of the study

H1 - There will be a positive relationship between grit and academic self-concept.

H2 - There will be a positive relationship between self-control and academic self-concept.

H3 - There will be a positive relationship between internal locus of control and academic self-concept.

Sample of the study

Participants included 126 undergraduate students from various academic fields ranging from arts and law, engineering and science, management and commerce etc. Participants were older than 17 years of age, all pursuing their undergraduate course. The sample had both male and female participants, out of which the female participants accounted for 58.9% whereas the male participants accounted for 41.1%. After providing informed consent, participants completed questionnaires that assessed grit, self-control, locus of control and academic self-concept.

Tools for data collection

The data for the current research were collected using the following tools:

Grit Scale (Duckworth, Peterson, Matthews, & Kelly, 2007): The Grit Scale consists of 12-items that assess the tendency to sustain interest in and effort toward very long-term goals. Individuals respond to each item on a scale of 1 to 5, where 1= very much like me, 2= mostly like me, 3= somewhat like me, 4= not much like me and 5= not like me at all. High score indicates higher level of gritty behavior.

Self-control Scale (Tangney, Baumeister, et al. 2004): The questionnaire consists of 13 statements. Individuals rate each item on a 1 to 5 scale, ranging from 1=strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly disagree. It was developed with the purpose of assessing self-control. High self-control predicts good adjustment, better peer relationships and good academic performance. The new scale showed good internal consistency and retest reliability. Higher scores correlate with better academic performance.

Locus of control Scale (Rotter, Julian, 1966): Rotter's internal-external locus of control scale is a 13 item questionnaire. Higher scores indicate external locus for the individual. Each item consists of a pair of

alternatives lettered ‘a’ or ‘b’, this questionnaire is to find out the way in which certain important events in our society affect different people i.e., whether the individual attributes himself for his success or failures which in turn indicates internal locus of control or whether he attributes other individuals or environmental/situational factors for his life outcomes which in turn indicates external locus of control.

Academic Self-Concept Scale i.e., ASCS (Reynolds, 1988): The ASCS is used to measure academic self-concept. Test items on the ASCS such as, "If I try hard enough, I will be able to get good grades.", "Most of the time while taking a test I feel confident.", "I feel that I am better than the average college student.", and "I consider myself a very good student." are used to explore student confidence in their academic capabilities. It consists of 40 items. Individuals rate each item on a 1 to 5 scale, ranging from 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly disagree. If the total score is high then it indicates good academic self-concept and similarly low score indicates poor academic self- concept.

Results & Discussion
Result

The purpose of the current study was to assess how non- cognitive factors namely grit, self-control and locus of control affects academic self-concept in undergraduate students and what the relationship is between non cognitive factors and academic self-concept. The results and their description are given below:

Table 1: Descriptive statistic for grit, self-control, locus of control and academic Self-concept.

Variable	Mean	SD
Grit	32.30	5.34
Self- control	37.66	8.54
Locus of control	5.80	2.52
Academic self- concept	130.13	11.40

The above table represents a descriptive statistic of all the variables considered for the study. The result table signifies the mean and standard deviation for grit of the sample comes out to be 32.30 and 5.34 respectively. The mean and standard deviation for self- control of the sample comes out to be 37.66 and 8.54

respectively. The mean and standard deviation for the locus of control of the sample comes out to be 5.80 and 2.52 and for academic self-concept it comes out to be 130.13 and 11.40 respectively.

Table 2: Pearson correlation between grit, self-control, locus of control and academic Self- concept

Variable	Grit	Self-control	Locus of control	Academic self-concept
Grit	-	.63**	.108	.52**
Self-control		-	.244**	.056
Locus of control			-	.15
Academic self-concept				-

** Correlation is significant at the 0.01 level (2-tailed).

A test of Pearson correlation was used to address the relationship between the variables. From the above table we conclude that, grit has a significant positive correlation at 0.01 levels with self-control and academic self- concept and positive correlation with locus of control. Self- control has a significant positive correlation at 0.01 levels with locus of control and positive correlation with academic self-concept, whereas locus of control has a positive correlation with academic self-concept.

Discussion

The purpose of the current study was to examine the relationships among grit, self-concept, locus of control and academic self-concept in undergraduate students. Over the years, psychologists and educationists have been extensively studying the relationship between non-cognitive factors and academic self-concept. Academic self-concept can be defined as the individuals believe or perception about his/her academic abilities in a particular academic field. Researches have indicated academic self-concept as a reliable indicator and predictor of academic success and academic achievement. Traditional intelligence tests such as those developed by Wechsler and Alfred Binet placed extreme importance on cognitive factors as the only predictor of academic success and discarded the importance of non-cognitive factors. Academic success and

academic achievement involves both cognitive as well as non-cognitive factors. In response to the role of non-cognitive factors in academic performance, several theoretical models have been developed; however, there have been very few empirical attempts to validate those models. Overall, the purpose of this study is to establish that non-cognitive factors have a role to play in an individual's academic success.

The first hypothesis of the study was that there will be a positive relationship between grit and academic self-concept. The aforementioned result supports the hypothesis. There is a positive relationship between grit and academic self-concept which indicates that there is a positive correlation between grit and academic self-concept, which implies that both grit and academic self-concept are directly proportional to each other i.e., if one increases so does the other. This may be because an individual who is considered to be "gritty" i.e., has perseverance, passion for long term goals, works strenuously towards his future and doesn't give in to short-term gratification is likely to perform well academically as he/she is highly motivated and determinate to achieve their goals. They do not give up easily and brush off their failures as lessons to be learned and continue striving for their goals. They tend to abide by their goals strictly and keep doing it till the end. Individuals, who are gritty, tend to have a strong academic self-concept and are positive about their academic abilities and capacities. They are confident about their academic abilities and continuously strive for their best even in the face of obstacles. The term grit is often used interchangeably with perseverance and tenacity, all three referring to an individual's determination and long term passion for their goals.

In earlier research findings grit had little correlation with intelligence, but that grittier individuals had attained higher degree of education as compared to less gritty individuals of the same age (Duckworth et al., 2004). Others were able to find that grit is a predictor for psychological well-being (Salles, Cohen, and Mueller, 2014) and happiness (Von Culin, Tsukayama, and Duckworth, 2014). Overall grit has positive outcomes for academic achievement (Duckworth and Gross, 2014). There is also evidence that perseverance in

higher education could lead to an increase in academic outcomes and achievements (Chang, 2014).

The second hypothesis of the study was that there will be a positive relationship between self-control and academic self-concept. The aforementioned result supports the hypothesis. There is a positive relationship between self-control and academic self-concept which indicates that there is a positive correlation between self-control and academic self-concept, which implies that both self-control and academic self-concept are directly proportional to each other i.e., if one increases so does the other. Self-concept is the ability to subdue one's emotions, thoughts and feelings in the face of temptation and is an admirable quality to possess in all sphere of life. This maybe because individuals who have self-control and can regulate themselves in the face of adversity is likely to have a positive belief in their academic capabilities and thus in turn achieve academic success. Nearly all students experience conflict regarding their academic goals at some point in their life. Students who exhibit high self-control tend to readily overcome such conflicts regarding their academic goals as they align their thoughts, attitudes and feelings in a uniform direction, maintaining control over them and utilize them in a positive manner. Individuals possessing self-control learn to model their impulses. They learn to steer their emotions rather than their emotions taking control of them. They tend to be self-disciplined and self-reliant. It is only natural that individuals who have self-control to perform well academically as they have trust in their academic capabilities and thus learn to regulate themselves accordingly.

Similar findings have been reported by other researchers, one long-term study had found that individuals who had high level of self-control during childhood, continued to have high levels of physical and mental health in adulthood (Chang, 2014)

The third hypothesis of the study was that there will be a positive relationship between internal locus of control and academic self-concept. The above mentioned result supports the hypothesis. There is a positive relationship between internal locus of control and academic self-concept which implies that internal locus

of control is positively associated with academic self-concept. Individuals possessing internal locus of control strongly believe that they have a firm and stern control over their life outcomes and attribute their success and failures to themselves and not anyone else, whereas, individuals possessing external locus of control hold the belief that they are secondary characters in their own story and that they do not possess any control over their life outcomes and thus tend to believe in fate, chance factor, coincidence and so on. From the result, we conclude that individuals exhibiting internal locus of control will have high academic self-concept, i.e., they will have belief in their academic abilities and thus will attribute their success and failures to their own

self. It is generally seen that individuals possessing internal locus of control do not have the blame it attitude and also do not seem to develop a fallout with their teachers. They never tend to complain about unfair treatment by their teachers and thus are more likely to achieve academic success in comparison to individuals possessing external locus of control. Thus higher the internal locus of control, higher will be the academic self-concept. Researches have also proven that in the long run individuals with internal locus of control are much better of as they have a strong sense of efficacy, tend to work harder for achieve their goals and feel confident in the face of challenge.

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THE EFFECTS OF WOBBLE BOARD AND SWISS BALL TRAINING ON THE VARIABLE OF ABDOMINAL STRENGTH AMONG SCHOOL STUDENTS

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ABSTRACT

The aim of the present study was to determine the effects of wobble board and swiss ball training on the variable of Abdominal Strength among school students. A random group design was adopted for the study. Forty-five (N=45) students from seventh and eighth standard were selected as subjects on random basis and their age ranging between 13 to 14 years. The students were selected from the Government Model Senior Secondary School, Sector-56, Chandigarh. Pre test was conducted on the motor fitness variable of abdominal strength. An Experimental Group-I was exposed to wobble board training, where as the other experimental group-II was exposed to swiss ball training, control group was not exposed to do any specific training other than their daily routine activities. The training was given for six days a week for duration of twelve weeks. The Analysis of Covariance (ANCOVA) technique was used to test the adjusted post- test mean difference among school students on the variable of Abdominal Strength. After the twelve weeks, ANCOVA indicated that there was an effect of training in Abdominal Strength $F(2, 41) = 3.23, p < 0.05$. The result revealed that a significant differences have been observed among school students of different groups namely; wobble board, swiss ball and control group on the variable Abdominal Strength.

Keywords: Abdominal Strength, wobble board, swiss ball and control group.

Introduction

Every Athlete takes part in practise with a training which is structured and focused to achieve a specific goal. The aim of the sports training is to boost the athlete's skills and work proficiency to optimise athlete's performance. A variety of variables like psychological, physiological and sociological are involved and also undertaken a long period of time. Day by day preparation of athletes is constantly evolving by using the science in sports. This evolution is mainly based upon an understanding about human body how it adapts to different physical and physiological stressors.

Abdominal strength is the capacity to exert force by the abdominal muscles. The prime motive should be the development of abdominal strength, which helps to enhance sports performance of the athletes. Abdominal muscles are comprised of internal and external four oblique muscles from lower ribs to opposite hips diagonally which twist the trunk; the rectus abdominis, running from your pubic bone to your lower ribs, which flexes the spine; and the transverse abdominis, a flat sheath of muscles running across the torso which acts as a muscular girdle to support the contents of the

abdomen. Zatzorski (1968) considers that strength magnitude is the utility of nerve impulse on muscle which determine three factors: inter-muscular coordination, intra-muscular coordination and force. An athlete can improve strength by overcoming internal (attempting to flex an arm while opposing it with the other one) or external resistance (individual body weight, exercises with the help of a partner etc.) Blackburn (2000) concluded that abdominal strength make muscles more stable to resist the muscle length which improves neuromuscular coordination by increasing proprioceptore sensitivity to the muscles and decrease electromechanical delay from the muscle spindle.

Methodology

The study was conducted on forty five (N=45) students from Government Senior Secondary School, Sector-56, Chandigarh aged between 13 to 14 years. A random group design was adopted for the study and all the subjects were randomly divided in to three groups and each group had fifteen (N=15) subjects respectively An Experimental Group-I was exposed to wobble board training, where as the other experimental group-II was exposed to swiss ball training, control group was not exposed to

do any specific training other than their daily routine activities. The experimental duration was of 12 weeks and after the experimental treatment, all the subjects were measured on the selected motor fitness parameters. The final test scores formed as post test scores of the subjects. Abdominal Strength was taken with sit ups Test. The Analysis of Covariance

(ANCOVA) at 0.05 level of significance was applied.

Results

The data collected was analyzed by using descriptive statistics and scores of post mean of balance was presented in table-1

Table-1: Descriptive Statistic of Abdominal Strength of Three Different Groups of School Students

Groups	Pre-Test		Post-Test		Adjusted Mean
	Mean	SD	Mean	SD	
Wobble Board Group	40.00	5.73	49.60	5.67	48.22
Swiss Ball Group	35.93	6.48	44.13	5.13	44.08
Control Group	31.40	6.99	35.26	5.62	36.69

Table 4.1 revealed pre-test Mean and SD, post test mean and SD and adjusted mean of three different groups namely; wobble board group, swiss ball group and control group. The pre test mean & SD of wobble board group was 40.00 & 5.73, pre test mean & SD of swiss ball group was 35.93 & 6.48 and pre test mean & SD of control group was 31.40 & 6.99. Post test mean

and SD of wobble board group, swiss ball group and control group were 49.60 & 5.67, 44.13 & 5.13 and 35.26 & 5.62 respectively. The adjusted mean of wobble board group was 48.22, adjusted mean of swiss ball group was 44.08 and adjusted mean of control group was 36.69.

Table-2: Analysis of Co-Variance in Abdominal Strength Test of Three Different Groups of School Students

	SS	Df	MSS	F-value	P-value (Sig.)
Treatment	779.99	2	389.99	14.79	.00*
Error	1080.53	41	26.35		

*Significant, $f_{.05}(2, 41) = 3.23$

Table-2, indicated that sit ups test perform for abdominal strength among school students of different groups, namely; wobble board group, swiss ball group and control group was found significant after implementing the 12 weeks of training as the p-value (Sig.) .00 was found lesser than .05 level of significant ($P < 0.05$).

Since the obtained P-value was found significant, therefore, least significant difference (LSD) post hoc test was also employed to find out the significance pair wise difference existed among three groups. The results of LSD Post-hoc test have been presented in table-3.

Table-3: Pair Wise Mean Comparison in Abdominal Strength of Three Different Groups of School Students

Wobble board	Swiss ball	Control group	Mean difference	P-value (Sig.)
48.22	44.08	-----	4.14	.03*
48.22	-----	36.69	11.53	.00*
-----	44.08	36.69	7.39	.00*

*Significant, $f_{.05}(2, 41) = 3.23$

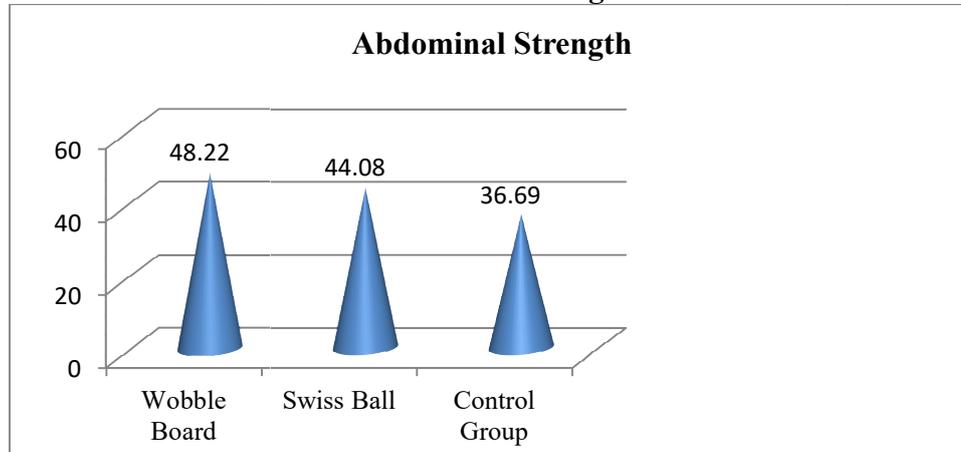
Table-3 shows pair wise comparison among all the here groups. The mean difference between

among wobble board and swiss ball of school students was found 4.14 and the mean

difference between wobble board and control group is 11.53. Further, the mean difference between swiss ball and control group is 7.39

which is significant at .05 levels because the p-value is less than .05.

FIGURE-1
Graphical Representation of Mean Scores With Regard to School Students on the Variable Abdominal Strength



Results

The pre- and post-test scores of the subjects in the three different groups on abdominal strength were compared to determine if there were any changes between the groups and within each group. This was done in order to determine whether the wobble board training or swiss ball training program had any effect on the subjects' abdominal strength performance. Pre test for abdominal strength was conducted seven days before the training and post test was conducted on the very next day on completion of twelve weeks training program.

The result has been revealed from the above table-1 that significant differences were found between pre and post test scores among male school students of different groups namely; wobble board, swiss ball and control group on the variable abdominal strength which were

compared by using ANCOVA. The above results indicate that after giving twelve weeks of wobble board and swiss ball training programme, there is significant improvement in abdominal strength among school students. Chandel (1993) reported that significant mean difference was found in the favour of tribal students and found to be superior in sit-ups on physical fitness variable of abdominal strength. Kumar (2013) explored the results stated that the abdominal strength training had significantly improved the strength endurance and explosive power of women players.

Conclusion

It is concluded from the result that that significant differences have been observed among school students of different groups namely; wobble board, swiss ball and control group on the variable Abdominal Strength.

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EFFECT OF YOGIC EXERCISE INTERVENTION ON AEROBIC AND ANAEROBIC EFFICIENCY OF WOMEN SOCCER PLAYERS

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ABSTRACT

Aerobic and Anaerobic capacity are important performance factors that determine the cardiorespiratory capacity of players. The objective of the present study was to find out the significant changes of yogic exercise intervention on aerobic and anaerobic capacity of Women Soccer Players. For this study, total 50 (N=50) subjects among the women soccer players participating senior state and national league competitions of Manipur were selected randomly and divided into two groups of 25 subjects each namely experimental group and control group. The experimental group only was assigned the yogic exercises of asanas and pranayamas for a duration of 8 weeks. 12 min Run-Walk and Sargent Jump-Lewis Nomogram tests were administered to obtain the data of aerobic and anaerobic capacity respectively. By the application of Paired sample 't' test and ANCOVA at 0.05 level of confidence, significant differences were found between experimental pre and post tests for aerobic and anaerobic capacity as the calculated $t=9.31$ and 4.70 ($p<0.05$) respectively, and insignificant differences were found in control group for both aerobic and anaerobic capacity as the calculated $t=0.70$ and 0.8 ($p>0.05$) respectively. Further, significant differences were found among the pre and post tests means comparisons of experimental and control groups for both aerobic and anaerobic capacity as the calculated $F=54.43$ and 16.34 respectively ($p<0.05$).

Keywords: Soccer, Yoga, Intervention, Aerobic and Anaerobic Capacity.

1. Introduction

Soccer is the most popular and truly a dominant game in the world. Soccer is considered as the most coordinated game that consisting of highly dramatic magical skills with dominant physical and physiological fitness to sustain the intensive workload of 90 minutes or more time span. Modern soccer training gives greater amplitude of preparing the players on physical and physiological capacity. Soccer has obtained the status of the most popular sport intercontinentally as around 250 million people enjoy playing soccer. Due to the simplicity and clarity of the game, it is loved in every corner of the world.

High-level soccer performance is the result of a multiple factors such as physical, motor abilities, constitutional mental abilities, high physiological work output, technical and tactical skill efficiency etc. The performance of excellent soccer players is the result of interactions of a number of these factors, which include high psychological and physiological demands. Therefore, soccer is a game of psycho-physio-physical activity. Modern soccer training gives greater emphasis in preparing the players physically, as well as the effects on the physiological parameters. Soccer

is a predominantly aerobic game and anaerobic energy is essential to performance in sprints, high-intensity runs, and duel plays, all of which may contribute to the outcome of the game.

It has been demonstrated that the total distance covered by high-intensity exercise during a match is related to the standard of soccer, with top-class players covering the most distance. It is therefore important that players are capable of exercising at high intensities for prolonged periods of time. Thus, a player needs a relatively high maximum oxygen uptake during a soccer match can be as high as 70% of VO_{2max} . An increase in VO_{2max} and the ability to sustain exercise for a prolonged period can be obtained by aerobic training [1].

Aerobic efficiency is expressed as the highest amount of oxygen consumed during maximal exercise with the use of large muscle groups of body. The maximum oxygen uptake (VO_{2max}) is perhaps the physiological parameter most evaluated in elite soccer players. The average level of VO_{2max} is about $60ml.kg^{-1}.min^{-1}$, but, individual figures as high as $76ml.kg^{-1}.min^{-1}$ has been reported. Maximum oxygen uptake has been observed to be higher for midfielders than for players in other positions and this has been associated with a longer distance covered in the game [2]. Maximum oxygen uptake

(VO₂ max) is defined as the highest rate at which oxygen can be taken up and utilized by the body during severe exercises. It is one of the main variables in the field of exercise physiology and is frequently used to indicate the cardiorespiratory fitness of an individual. Therefore it is a major measure that indicates the functional capacity of the cardiorespiratory system. In the scientific literature, an increase in VO₂ max is the most common method of demonstrating a training effect and so it is frequently used in the development of an exercise prescription [3][4].

Soccer players frequently perform different rapid and sudden movements as quick development of force, sprinting, jumping, changing direction, high power-shooting, different body impact etc. Therefore, the players require high-intensity anaerobic capacity to perform various burst actions in actual situation. Anaerobic capacity is the ability to perform at maximal capacity for short periods of time and to minimize the amount of lactic acid production in the working muscle at a level of insufficient oxygen availability. Elite players must possess a good capacity to produce energy rapidly such during the high intensity periods of the match. In those instances, the anaerobic energy delivery pathways are primarily utilized. In order to assess the maximal anaerobic power of the players different methods have been utilized during which the players have performed anaerobic activities similar to those performed during soccer play, such as sprints, jumps, and ball kicks [2]. The high level of the anaerobic capacities in soccer players enables them to perform high-speed runs, which in the end may have a crucial impact on match results. Soccer is a predominantly aerobic game and anaerobic energy is essential to performance in sprints, high-intensity runs, and duel plays, all of which may contribute to the final outcome of the game. Top-class soccer players are able to perform more high-intensity running than moderate professional soccer players [5].

Today, yoga is a mainstay for professional athletes and teams. More and more people are discovering the countless ways that yoga can be used to improve athletic performance—from increasing mental concentration and improving

flexibility and balance to preventing common injuries and honing skills. Soccer players can benefit from yoga to help improve flexibility, strength and endurance. Yoga can also improve agility and concentration by practicing yoga. Soccer players who practice yoga are more likely to be more focused and less likely to be injured during a game. Yoga loosens and prepares your muscles for the strenuous exercise of a soccer game, which can prevent muscle strains and joint stress [6].

Yogic exercise has several preventive and healing benefits for both mind and body. From a physical perspective, regular yoga practice can improve posture, increase energy and flexibility, strengthen muscles, and promote blood circulation and hormone function. Soccer players can benefit from participating the different yoga asanas and pranayama on improving the flexibility, strength, endurance, agility, concentration and other physiological systems. It is evident that soccer players who practice yoga regularly can focus more and decrease injuries during the game. It is also recommended that yoga loosens and prepares muscles for the strenuous exercise of a soccer game, which can prevent muscle strains and joint stress. The yoga asanas enhance muscle strength, coordination, flexibility, balance, control cholesterol level, reduces weight, regulate blood pressure and enhance cardiovascular performance. If we are looking for a creative way to develop strength and resistance training while improving range of motion, balance and body-mind concentration, yoga is a good addition to the players' routine workouts. Yogic exercises may be the perfect cross-training method for athletes of all sports and games. Practicing the yogic exercises, athletes can improve better breathing techniques along with the improvement of aerobic and anaerobic efficiencies with the improvement of different motor qualities.

Women's soccer is also one of the most prominent team game played by women around the globe. It is played at the professional level in numerous countries throughout the world. It is played in different level equal to men's soccer. Women soccer players' needs adequate different fitness level to depict the best performance for duration of 90 minutes or more.

2. Objectives

The objectives of the study are:

- i. To investigate the significant changes of yogic exercise intervention on aerobic and anaerobic efficiency of Women Soccer Players.
- ii. To see whether there is any significant impact of yogic exercise intervention on aerobic and anaerobic efficiency of Women Soccer Players.

3. Materials and Methods

Total fifty (N=50) women football players, 18 to 30 years (M=24) of age from the clubs, competing at least in the senior state league of Manipur were selected randomly as the subjects of this study. The subjects were

divided into two groups of 25 subjects each based on the initial test means and designated as Experimental Group- A (Yogic Exercise Intervention Group) and Control Group- B (Non-Yogic Exercise Intervention Group). The Experimental Group-A was assigned the yogic exercises for a duration of 8 weeks and the Control Group-B was kept without participating the specific yogic exercises. The yogic exercise program was administered in the morning before the players leaving for regular football practice session for 5 days per week. A pilot study was conducted on five selected players to design the yogic exercise intensity and duration. The schedule of Yogic Exercise Intervention programme (training plan) is shown in the table 1.

Table- 1: Schedule of Yogic Exercise Intervention Programme For 8 Weeks

Week	Exercise Category	Yogic Exercises	Practice duration	Total Duration	
I - IV	Asanas	Warm up & Loosening Exercises	5 min	30 min	
		Tadasana	3 min		
		Utkatasana			
		Vriksasana			
		Natarajasana			
		Suryanamaskar	5 min		
		Savasana	1 min		
		Sarvangasana	4 min		
		Matsyasana			
		Makarasana			
		Bhujangasana			
		Pashchimotasana			
		Konasana	4 min		
	Pranayamas	Anulom-Vilom			
		Kapalbhati			1 min
		Bhastrika			1 min
		Ujjayi			1 min
Shitali					
Shitkari					
Savasana	5 min				
V - VIII	Asanas	Warm up & Loosening Exercises	5 min	35 min	
		Tadasana	4 min		
		Utkatasana			
		Vriksasana			
		Natarajasana			6 min
		Suryanamaskar			
		Savasana	1 min		
		Sarvangasana	5 min		
		Halasana			
		Matsyasana			
		Makarasana			
		Dhanurasana			
		Pashchimotasana			
		Konasana			
Vakrasana					

	Pranayamas	Shirasana	
		Anulom-Vilom	5 min
		Kapalbhati	1 min
		Bhastrika	1 min
		Ujjayi	2 min
		Shitali	
		Shitkari	
		Savasana	5 min

To determine the aerobic capacity (VO₂max), 12 Minutes Run-Walk Test was administered and the formula:

$VO_{2max} (ml/kg/min) = 35.9712 (\text{distance in miles for 12min run-walk}) - 11.2878$ was employed. Sargent Jump- Lewis Nomogram was adopted to measure the anaerobic capacity and expressed in Kg-m./sec.

The descriptive, paired sample 't' test and analysis of co-variance (ANCOVA) statistical techniques were employed to find out the

characteristics and significant means differences among the pre and post tests means of experimental and control groups for aerobic and anaerobic capacity.

4. Results

The descriptive analysis of obtaining data of experimental (Exp) and control (Cnt) pre and post test on women soccer players that determine the characteristics of Aerobic and Anaerobic Capacity are shown in the table 2.

Table 2: Descriptive Analysis Of Pre And Post Test Of Aerobic And Anaerobic Capacity

Variable	Group	Mean	N	SD	SE
Aerobic	Exp-pre	42.72	25	2.94	0.59
	Exp-post	46.17	25	3.16	0.63
	Cnt-pre	44.71	25	3.65	0.73
	Cnt-post	44.53	25	3.16	0.63
Anaerobic	Exp-pre	67.44	25	9.06	1.81
	Exp-post	70.76	25	8.17	1.63
	Cnt-pre	70.52	25	4.63	0.93
	Cnt-post	70.16	25	4.80	0.96

Table 2 shows that the means (M) and the standard deviations (SD) of aerobic capacity (VO₂max) of women soccer players for experimental pre and post tests were 42.72±2.94 and 46.17±3.16, and control pre and post tests were 44.71±3.65 and 44.53±3.16 respectively. Further, the means (M) and the standard deviations (SD) of anaerobic capacity

for experimental pre and post tests were 67.44±9.06 and 70.76±8.17, and control pre and post tests were 70.52±4.63 and 70.16±4.80 respectively.

The mean differences between the pre and post tests of aerobic and anaerobic capacity for both experimental and control groups are presented in figure 1 and 2 respectively.

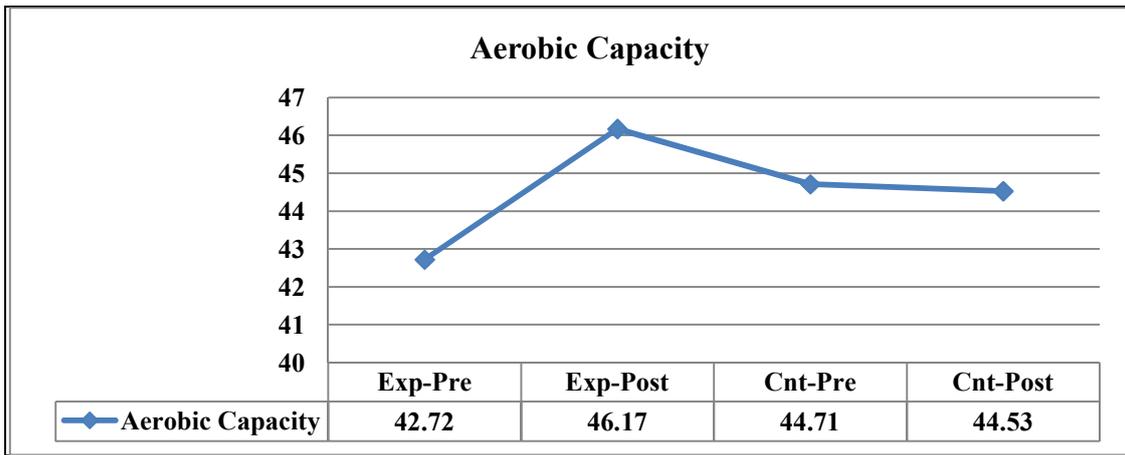


Fig. 1. Mean Differences between the Pre and Post Tests of Aerobic Capacity for Experimental and Control Groups.

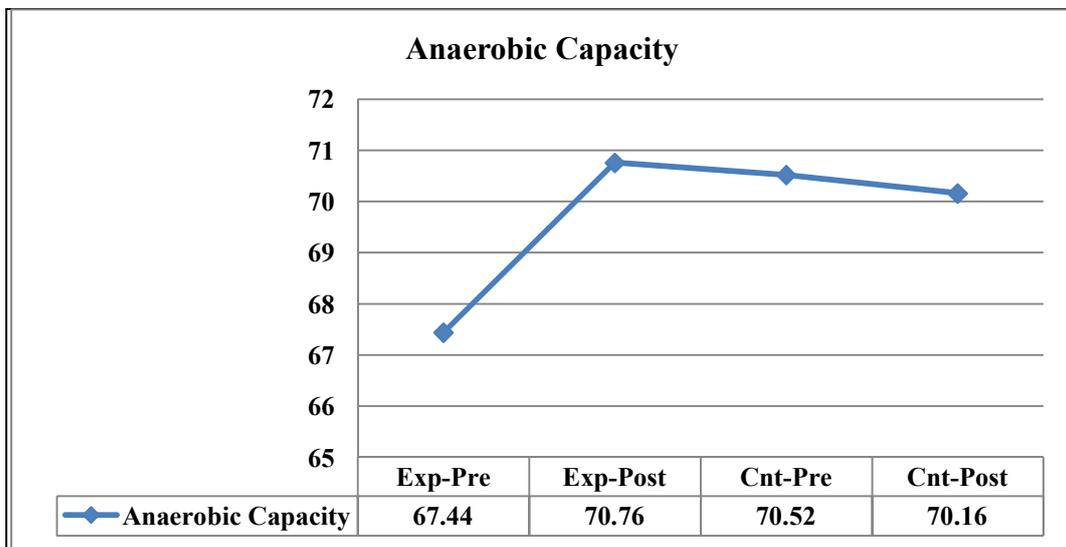


Fig. 2. Mean Differences between the Pre and Post Tests of Anaerobic Capacity for Experimental and Control Groups.

The means comparison between the pre and post-tests of experimental and control groups for aerobic (VO₂max) and anaerobic capacity, and the significant differences among the pre

and post-test means of experimental and control groups have been shown in the respective table 3 and 4.

Table- 3: Means Comparison Between The Pre And Post Tests Of Experimental And Control Groups For Aerobic And Anaerobic Capacity

Variable	Group	M	N	SD	SE _M	t	Sig.
Aerobic	Exp-pre	42.72	25	2.94	3.45	9.31*	0.00
	Exp-post	46.17	25	3.16			
	Cnt-pre	44.71	25	3.65	0.18	0.70	0.49
	Cnt-post	44.53	25	3.163			
Anaerobic	Exp-pre	67.44	25	9.06	0.71	4.70*	0.00
	Exp-post	70.76	25	8.17			
	Cnt-pre	70.52	25	4.63	0.43	0.83	0.41
	Cnt-post	70.16	25	4.80			

*Significant at 0.05 level of confidence; Tabulated $t_{0.05}(24) = 2.06$ (N=25)

Table 3 reveals that significant differences were found between pre and post tests means of Aerobic and Anaerobic capacity for the experimental group as the calculated values 't'=9.31 and 4.70 respectively are greater than the table value 't'=2.06 (p<0.05). However, for

control group, insignificant differences were found between pre and post tests means of aerobic and anaerobic capacity, as the calculated values 't'=0.70 and 0.83 respectively are lesser than the table value 't'=2.06 (p>0.05).

Table- 4 : Pre And Post Tests Means Comparison Of Experimental And Control Groups

Variable	Group	M	N	SD	F	Sig.
Aerobic	Exp-pre	42.72	25	2.94	54.43*	0.00
	Exp-post	46.17	25	3.16		
	Cnt-pre	44.71	25	3.65		
	Cnt-post	44.53	25	3.163		
Anaerobic	Exp-pre	67.44	25	9.06	16.34*	0.00
	Exp-post	70.76	25	8.17		
	Cnt-pre	70.52	25	4.63		
	Cnt-post	70.16	25	4.80		

*Significant at 0.05 level of confidence; $F_{0.05}(1,47)=4.05$

Table 4 reveals that there were the significant differences among the pre and post test means of Aerobic and Anaerobic capacity of experimental and control groups as the calculated values of F= 54.43 and 16.34 respectively are quite greater than the table value of F=4.05.

5. Discussion

The main purpose of the study was to investigate the significant changes of yogic exercise intervention on aerobic and anaerobic efficiencies of Women Soccer Players. The pre and post tests mean scores of the experimental and control groups were compared to examine if there was a significant change in the aerobic and anaerobic efficiencies of the selected women soccer players. To assess the results in pre and post tests mean scores within each group, paired t-test was employed. Further, ANCOVA was used to determine whether the yogic exercises intervention have a significant impact on aerobic and anaerobic capacity for women soccer players in addition to their normal training.

The results of the study had shown that there were the significant effects of yogic exercise intervention on aerobic and anaerobic efficiencies of experimental group. However, no significant effect was evidenced for control group. In addition, there were significant impact of yogic exercises intervention on aerobic and anaerobic capacity among the pre and post tests means comparison of

experimental and control groups. Pal, et al. (2013) [7] found significant improvement of three months yogic practice on physiological and physical parameters of physically active service personnel. Dojjad, et al. (2013) [8] proved an increase of aerobic capacity (VO₂ max) by the yogic practice of 12 weeks. The selected Hatha yogic practice for 12 weeks could enhance the kicking ability also in soccer playing was found by Johnson, et al. (2007) [9]. Donohue, et al. (2006) [10] had agreed with the yoga interventions exercise designed to improve long distance runner performance. Rayat (2015) [11] had justified the significant improvement of selected yogic asana & pranayama for 12 weeks on physical variables and physiological variables. Further, the results of the present study had strong agreement with the study of Chatterjee K. (2016) [12], Johnson, P. C.& Mariayyah, P. (2007) [13], Woody A. (2008) [14], Kulkarni S.V. (2017) [15] and Adhikari, A. & Sahu, D. P. (2016) [16]. Raj, V. (2018) [17] and Kaur, J. et al. (2001) [18].

The discussion more emphasizes that yogic exercise intervention can improve players' fitness and enhance performance of different sports. Different authors used combined yogic exercises and build up training programmes for different months, which shown significant impact of the training programmes to the players involved.

6. Conclusion

The present study concluded that

- i. There was the significant effect of yogic exercise intervention on aerobic and anaerobic efficiency of experimental group.
- ii. Insignificant improvement was found on aerobic and anaerobic efficiency of control group, which was not treated the yogic exercise intervention.
- iii. There were significant impact of yogic exercise intervention on aerobic and anaerobic capacity among the pre and post tests means comparison of experimental and control groups of women soccer players.

Therefore, it can be concluded that the yogic exercises intervention programme of this study have significant effect and its impact for enhancing the aerobic and anaerobic efficiency of women soccer players.

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EFFECT OF VARIED INTERVAL TRAINING ON HEART RATE, VO₂MAX AND BLOOD GLUCOSE LEVEL

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ABSTRACT

The present study aimed to evaluate the effects of intensive and extensive interval training on Resting Heart Rate (RHR) Peak Exercise Heart Rate (PEHR), Cardio-respiratory fitness in terms of maximum oxygen uptake (Vo₂ max) and Fasting Blood Glucose Level (FBGL). For the said purpose twenty two (N=22) college women of age ranged between 22-24 years were randomly selected. They were divided into two equal groups, keeping eleven subjects in each group, viz. intensive interval training group (IITG) and extensive interval training group (EITG). Both the group (IITG and EITG) were undergone their respective training program for the period of eight weeks. Both type of interval training were structured scientifically and intervened to the subjects for three days per week. All the subjects of two groups were tested on said variables at prior to and immediately after the training programme. In the present study For the sake of analysis of data mean and standard deviation of the variables were calculated and statistical t-test was used to compare the mean. The level of significance was set at $p < 0.05$ level of confidence. The result showed that a significant mean difference ($p < 0.05$) existed between pre and post test condition of intensive interval training group (IITG). The result also showed that a significant mean difference ($p < 0.05$) existed between pre and post test condition of extensive interval training group (EITG) in RHR & VO₂ max. But no significant difference observed in FBGL between the pre and post test condition of extensive interval training group (EITG).

Keywords: Intensive Interval Training, Extensive interval training, Resting Heart Rate, Vo₂ max, and Fasting Blood Glucose Level.

Introduction

Interval training is the most versatile method of endurance training which involves repeated efforts at a relatively faster pace, separated by measured intervals of incomplete recovery (Singh, H, 1991). Interval training in the sports field is a popular means of training that affects the physiological functioning of the body and brings the change in the synchronicity of the internal organic function which ultimately influences the performance and efficiency. But many questions regarding the effectiveness of Interval training upon the functional capacities and efficiencies of human remain unanswered. Though the advantages and disadvantages of different interval training programs have been investigated earlier but the result are not still enough to conclude. So the present study was under taken to contribute to the body of knowledge about the affectivity of different interval training program on Cardiorespiratory functioning of human being. Thus the purpose of the present Study was to find out the effectiveness of intensive and extensive interval training and its influence upon certain physiological performance variables of young college women.

Methodology

Subject & Design: 29 college women belonging to the age group of 18 to 24 years were selected randomly. The subjects were eliminated on the basis of the condition applied that each subject must have a minimum training age of 2 - 3 yrs. Finally twenty two (N = 22) eligible subjects were divided into two equal groups, keeping eleven (n=11) subjects in each group, viz. intensive interval training group (IITG) and extensive interval training group (EITG). The equated group comprised of a close values of certain variables like age, height, and body weight.

Criterion measure: The variables studied in the present study were Resting Heart Rate (RHR), cardiorespiratory fitness in terms of maximum oxygen uptake (Vo₂ max) and Fasting Blood Glucose Level (FBGL). Resting heart rate was recorded by palpation method. Predicted VO₂ max was estimated by Queen's College step test and Blood glucose level was measured by Glucometer (Accu-check).

Training programme: Prior to the intervention of 8-week intensive and extensive interval training programme the researchers ensure to prepare and equalize the fitness of all the

female athletes and enable them to tolerate the training program for eight week long. For that all the subjects were undergone a preparatory training program for 2-week duration. After this initial conditioning program intensive and extensive interval training were given separately on both the groups for 8-weeks. It was given for three days per week and in a day the work out lasted for 30 to 45 minutes approximately. The training session includes warming up and cooling down processes. The subjects underwent their respective training programs as per schedules (tab-1) under the

supervision of the researchers. The study included pre- and post- test measurements on either side of the 8-week interval training programme. Apart from the intervention of treatment both the group were participated to their regular physical education activities as per their curriculum in concern, which was not under the control of the researchers. The subjects were requested to refrain from eating, drinking or doing any strenuous physical work at least for 2 hours before the onset of experiment

Table-1
Intensive and extensive interval training programme

Week	Intensive Interval Training				Extensive Interval Training				Duration
	Training	Rept.	set	Intensity	Training	Rept.	set	Intensity	
1 & 2	50 m. run,4x10m	2	4	(70-75)% Incomplete	50 m. run,4x10m 35 m. run 4x10m	2 3	4 4	70% Incomplete Rest bet ⁿ Rept.120 Sec	45-60 minute
	35 m. run 4x10m	3	4	Rest bet ⁿ Rept. 120 Sec					
3 & 4	50 m. run,4x10m	2	4	(75-80)% Incomplete	50 m. run,4x10m 35 m. run 4x10m	2 3	4 4	70% Incomplete Rest bet ⁿ Rept.110 Sec	45-60 minute
	35 m. run 4x10m	3	4	Rest bet ⁿ Rept. 90 Sec					
5 & 6	50 m. run,4x10m	2	5	(80-85)% Incomplete	50 m. run,4x10m 35 m. run 4x10m	2 3	5 5	70% Incomplete Rest bet ⁿ Rept.100 Sec	45-60 minute
	35 m. run 4x10m	3	5	Rest bet ⁿ Rept. 60 Sec					
7 & 8	50 m. run,4x10m	2	6	(85-100)% Incomplete	50 m. run,4x10m 35 m. run 4x10m	2 3	6 6	70% Incomplete Rest bet ⁿ Rept.90 Sec	45-60 minute
	35 m. run 4x10m	3	6	Rest bet ⁿ Rept. 45 Sec					

Prior to the training sufficient worm-up of 12-15 minute were given for both the groups and after the training proper cool down exercises were performed as a whole.

Prediction of VO₂ max: Participants were asked to take complete rest for half an hour before performing the exercise so that pulmonary ventilation and pulse rate might come down to a steady state.

The Queen's College Step Test (QCT) which has been recommended as a valid and reliable indirect method for prediction of VO₂ max was adopted in the present investigation. Direct estimation of VO₂max is exhaustive, laborious and difficult experimental protocol (Fox, E.L.,

1973). In brief the step test was performed using a stool of 16.25 inches (or 41.30 cm) height. Stepping was done for a total duration of 3 minutes at the rate of 24 cycles per minute which was set by a metronome. After completion of the exercise, the subjects were asked to remain standing comfortably and the carotid pulse rate was measured from the fifth to the twentieth second of the recovery period. This 15 second pulse rate was converted into beats per minute (15 sec pulse rate x 4) and the value thus obtained was put in the following equation to predict VO₂max in ml/kg/min, as proposed by McArdle et al., 1986.

$VO_2 \text{ max (ml/kg/min)} = 65.81 - (0.1847 \times \text{pulse rate in beats per min})$

All experiments were performed at a room temp varying from 27–29°C and at a relative humidity ranging between 70 and 85%.

Measurement of heart rate (RHR): Each subject was allowed to take rest at recumbent position for a minimum period of half an hour so that the pulse rate might come down to a steady state. At the end of this period of initial rest, resting heart rate was measured by counting the beats for 1 minute feeling the palpation of the radial artery.

Prediction of Fasting Blood Glucose Level (FBGL): FBGL measurements were carried out by Glucometer (CONTOUR™ TS) by Accu-check technique. The pre- and post training venous blood samples were obtained from the participants between 8:00 and 10:00

AM after a 12-hour overnight fast and at least 48 hours after the last exercise session.

Statistical analysis: In the present study For the sake of analysis of data mean and standard deviation of the variables were calculated and statistical t-test was used to compare the mean. The level of significance was set at $p < 0.05$ level of confidence. For statistical calculations Excel Spread Sheet of windows version 7 was used.

Results

In Table-2 the mean ± standard deviation, mean difference of obtained data and ‘t’-value between pre and post test belonging to different physiological variables (RHR, VO_2 Max and FBGL) as measured and calculated by different tools and techniques of intensive interval training group (IITG) and extensive interval training group (EITG) have been presented.

Table-2

‘t’ value between pre and post test mean of intensive and extensive interval training group on RHR, PEHR, VO_2 Max and FBGL

Variable	Group	Pre-Test	Post- Test	Mean Difference	‘t’-Value
		Mean ± SD	Mean ± SD		
RHR (bit/minute)	IITG	68.94 ± 6.70	65.30 ± 5.40	3.64	6.19*
	EITG	72.40 ± 3.86	68.00 ± 3.05	4.40	4.49*
VO_2 Max (ml/kg/min)	IITG	34.33 ± 1.74	36.70 ± 1.44	2.37	16.02*
	EITG	35.29 ± 2.80	39.58 ± 2.49	4.29	23.29*
FBGL	IITG	92.40 ± 7.81	83.70 ± 9.20	8.70	4.02*
	EITG	95.10 ± 6.23	91.20 ± 5.45	3.90	2.07

Table value of ‘t’ for df (21) at 0.05 level of confidence = 2.83

From table-2 it is evident that in RHR there was significant difference ($p < 0.05$) between pre and post treatment condition of both IITG and EITG. It also showed that the MD (mean difference) of EITG was higher than IITG. In VO_2 Max there were also significant difference ($p < 0.001$) existed between pre and post treatment mean value of both IITG and EITG.

It also showed that the MD (mean difference) of EITG was higher than IITG. In FBGL though there was significant difference existed between pre and post treatment for IITG group but for EITG group there was no such significant difference in FBGL between pre and post treatment conditions.

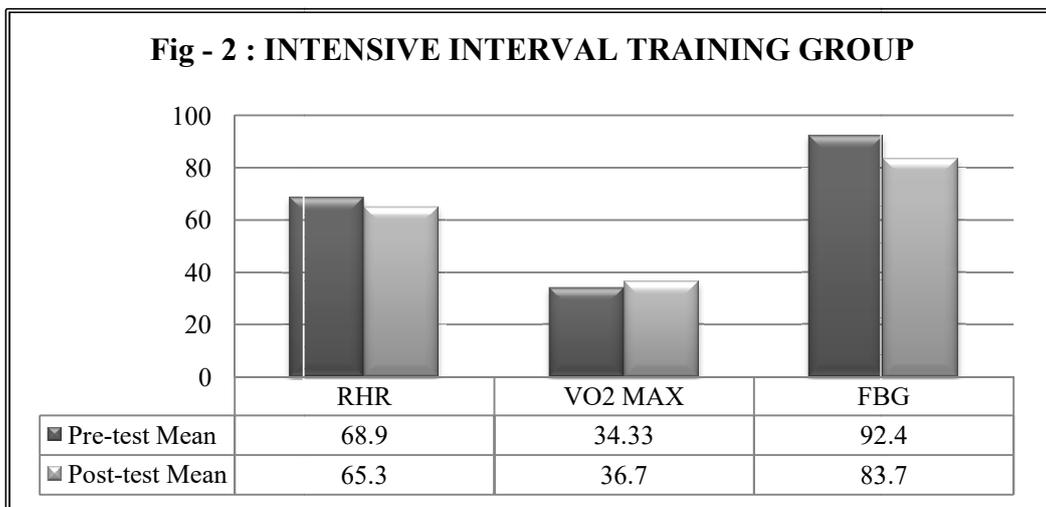
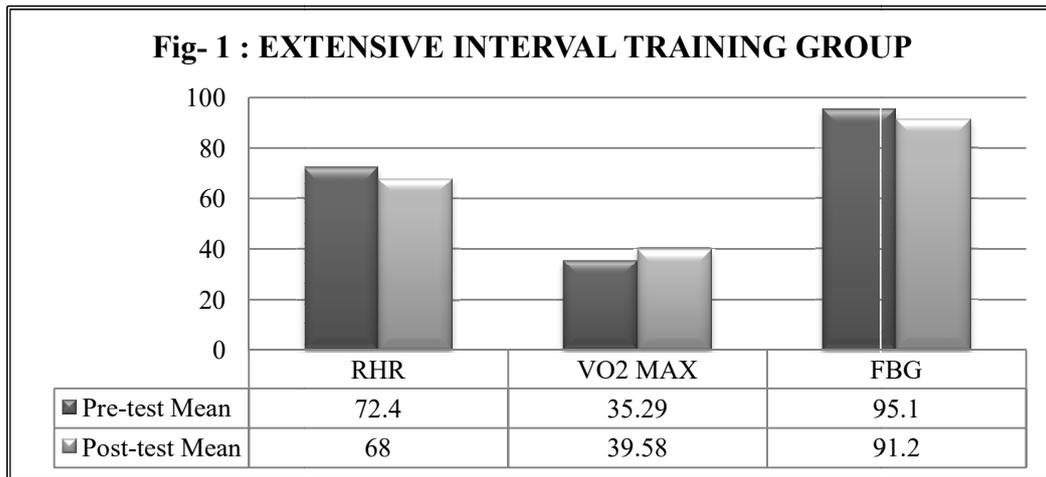


Figure- 1 and Figure-2 graphically represents the pre and post treatment condition of Extensive Interval Training Group (EITG) and Intensive Interval Training Group (IITG)

Discussions

The result implies that in pot test the Resting Heart Rate (RHR) significantly ($p < 0.05$) reduced in comparison to pre test conditions both for Extensive Interval Training Group (EITG) and Intensive Interval Training Group (IITG) which indicated that both type of interval training improved resting heart rate (RHR) more or less. The result supports the findings (4) It also showed that the mean difference (Pre test ~ Post test) of EITG was higher than IITG indicated that extensive interval training had greater positive impact on Resting Heart Rate (RHR) than intensive interval training. In respect of RHR the result is contradictory to the other findings (5, 6, and 7) In case of VO_2 Max significant difference ($p < 0.05$) was observed in comparison to pre

and post test conditions of both Extensive Interval Training Group (EITG) and Intensive Interval Training Group (IITG) which indicated that both type of interval training improved maximum oxygen uptake ability and supports the findings of Chidambara Raja, 1994, and Parameswari, G. & Elayaraja, M, 2010. The maximum oxygen uptake is a measure of the maximum exercise capacity thus is a dominant factor of good performance in almost all endurance events. It also showed that the mean difference (Pre test ~ Post test) of EITG was higher than IITG indicated that extensive interval training had greater positive impact on VO_2 Max than intensive interval training.

In the present study for FBGL significant difference observed ($p < 0.001$) between the pre and post test condition of the IITG but the difference was not statistically significant for EITG though each training in both group improved fasting blood glucose level. So from the stand point of the improvement of FBGL

the result gone in favor of intensive interval training which supports the finding of Karstoft K. et al. (2012) and

Conclusions

The results of the study showed that both type of scientifically structured interval training had a positive impact on Resting Heart Rate (RHR), Cardiorespiratory fitness in terms of maximum oxygen uptake ($\text{Vo}_2 \text{ max}$), and Fasting Blood Glucose Level (FBGL). Result

also showed that extensive interval training had greater positive impact on Resting Heart Rate (RHR), Peak Exercise Heart Rate (PEHR), and cardiorespiratory fitness in terms of maximum oxygen uptake ($\text{Vo}_2 \text{ max}$) than intensive interval training. On the other hand intensive interval training had greater positive impact on Blood Glucose Level (FBGL) than extensive interval training.

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FIT INDIA MOVEMENT

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ABSTRACT

*Fit India Movement started on 29th August, 2019 by Hon'ble Prime Minister of India. With the aim and objective of fitness of Indian citizen. Fit India Movement involves teaching and practicing the art of taking care of own body and health daily. Fit India Mission encourages Schools to Organise a **Fit India School Week** in month of November/December. Fit India movement has 3 star and 5 star school certification scheme and for same parameters also given certain guidelines. Fit India Mission encourages Youth Club to motivate people to become part of Fit India Movement by inculcating at least 45-60 minutes of physical activities in their day to day lives, individuals and Youth Club can undertake various efforts for their own health and well-being. Mission office has decided to join hands with well-known names from all walks of life and encourage people to bring about a behavioural change in their lives. With this, we aim to connect with well-known faces from different parts of the country as Fit India Ambassador. Cycling is one of the best ways to remain fit and healthy. Fit India Mission will be organising the Fit India Cyclothon from December 2020. Cyclothan can organised by cycling groups, schools, colleges, organisations, councils, panchayats, corporations, societies, NGO's, special interest groups across India. Fitness protocol for age 05 – 18, 18 – 65, 65 years given by Fit India Movement.*

Keywords: Objective, fitness, health, certification, physical activities, Cyclothon

Introduction

Hon'ble Prime Minister of India started Fit India Movement on 29th August, 2019. With the aim and objective of fitness of Indian citizen. The mission of the movement is to create awareness and behavioural changes with physically active lifestyle. Fit India Movement aims at behavioural changes – from sedentary lifestyle to physically active way of day-to-day living. Fit India would be a success only when it becomes a people's movement. Ministry of Youth Affairs and Sports heading this movement effectively with support of various organisations like Ministry of Women and Child Development, Council for the Indian School Certificate Examination, Government of India, Sports Authority of India, Khelo India. To make this moment successful undertake various initiatives and conduct events to achieve the following objectives:

- To promote fitness as easy, fun and free.
- To spread awareness on fitness and various physical activities that promote fitness through focused campaigns
- To encourage indigenous sports
- To make fitness reach every school, college/university, panchayat/village, etc.
- To create a platform for citizens of India to share information, drive awareness and

encourage sharing of personal fitness stories.

'How to Live' should be the first pillar of formal education. This involves teaching and practicing the art of taking care of one's body and health daily. Schools have to be the first formal institution after home where physical fitness is taught and practiced.

In the above background, the Fit India Mission encourages Schools to Organise a Fit India School Week in month of November/December. It has also prepared a set of Fit India School Certification with simple and easy parameters.

Fit India School Parameters

The following parameters would apply:

1. Having one teacher trained in PE, and such teacher is physically fit and active.
2. Having a playground Where two or more outdoor games are played.
3. Having one PE period each day for every section and physical activities (sports, dance, games, yogasan, PT) take place in the PE period.
4. Having all students spending 60 minutes or more on physical activities daily.

Fit India 3 Star School

The following additional parameters would apply for claiming a 3 Star certification:

1. All teachers to be physically fit and spending 60 minutes or more every day for physical activities.
2. School has at least two trained teachers (including one PET), each well versed with any two sports.
3. Sports facilities for 4 sports including the 2 outdoor sports.
4. Every student learns and plays 2 sports – one of which could be a traditional/indigenous/local game.

Fit India 5 Star School

The following additional parameters (over and above 3 Star certification) would apply for claiming the highest certification:

1. School conducts monthly intra-school sports competitions, participates in inter-school sports competition and celebrates Annual Sports Day.
2. All teachers are trained in PE.
3. School has 2 or more sports coaches. These may be PE teachers.
4. School follows structured PE curriculum prescribed by NCERT/ School Board.
5. School conducts annual fitness assessment of all children.
6. School opens its playground(s) after school hours for neighbouring communities, and the same is actively used. Reasonable fee can be levied for maintenance and security.

Procedure for Schools To Get Fit India Star Certification

1. Basic FIT INDIA SCHOOL would be self certified and registered online at www.fitindia.gov.in by the School. Upon registration, a certificate would be issued online to the School, and on receipt of such certificate the School would be entitled to use Fit India Logo and Fit India Flag.
2. For FIT INDIA 3 Star or 5 Star certification the school would have to file its claim online at www.fitindia.gov.in. The Fit India Mission would get the claim verified and thereafter issue an online certificate and commendation letter. The same would be followed in print and dispatched through postal mail.

FIT INDIA is going to be included in the Prime Minister's Award. FIT INDIA is successful

people's movement by providing leadership for the following:

1. Apprising all schools, public as well as private, in your State of the above and encouraging them to seek Fit India Ranking.
2. To honour Fit India 3 Star and 5 Star Schools by organising appropriate function in the State Head-Quarters. Fit India 5 Star Schools could be felicitated at State level Republic Day and Independence Day functions
3. Nominate a senior officer as a State Nodal Officer for Fit India in your department and intimate to us; and
4. Organise Fit India events at schools from time to time. You may encourage schools to use their creativity in designing and organising Fit India events.

Fit India Youth Club

FIT INDIA MOVEMENT aims at behavioural changes – from sedentary lifestyle to physically active way of day-to-day living. Fit India would be a success only when it becomes a people's movement. In the above background, the Fit India Mission encourages YOUTH CLUB to motivate people to become part of FIT INDIA MOVEMENT by inculcating at least 45-60 minutes of physical activities in their day to day lives, individuals and Youth Club can undertake various efforts for their own health and well-being as well as for the health and well-being of fellow Indians.

The following parameters would apply:

1. Youth Club should be affiliated with the concerned District Unit.
2. Each member of the Youth club should be aware about the importance of physical fitness and spend 30-60 minutes daily for at least 5 days every week for group physical activities.
3. Each member of the Youth Club should commit to motivate one additional person every month for incorporating physical activity of 30-60 mins in his/her daily routine.
4. The Youth club should organise or persuade the local body and school for organising one community fitness event every quarter.

To raise awareness on fitness and to spread Honourable Prime Minister to interact fitness enthusiasts from across the country in Fit India

Dialogue on September 24, 2020 and 27th December 2020.

Become A Fit India Ambassador

With the aim of making fitness a priority for all citizens, Fit India Mission office has decided to join hands with well-known names from all walks of life and encourage people to bring about a behavioural change in their lives. With this, we aim to connect with well-known faces from different parts of the country, who will not only make fitness as a priority in their lives but also motivate others to do so.

To honour their dedication and commitment towards our mission, we recognize them as Fit India Ambassadors.

Become A Fit India Champion

To honour their dedication and commitment towards our mission, we recognize them as Fit India Champion.

Fit India School Week 2020

School is the first place where habits are formed. School children should be encouraged to indulge in active field time during school hours involving fitness and sports activities. This will instil in students the understanding for regular physical activity and higher levels of fitness, thus enhancing self-esteem and confidence in them. Keeping these objectives in mind, Fit India School Week program was launched in 2019.

This year "Fit India School Week" will be celebrated virtually by schools in December.

Guidelines

1. Schools to ensure that all Students, Parents, Staff and Management shall actively participate in the Fit India School Week 2020 programme
2. Schools may create a new page on their website titled "Fit India School Week 2020" and a brief about the activities undertaken and related pictures/videos can be uploaded on it.
3. Schools should register themselves on <https://fitindia.gov.in/fit-india-school-week> and upload photos and video link related to the event

4. All registered schools may download a Digital Certificate, which can be downloaded from Fit India Portal after successful conduct of the Fit India School Week.
5. Schools are also encouraged to share/post activities conducted on their social media channels with #NewIndiaFitIndia

Activities

Day 1	I. Virtual Assembly – Free hand exercises II. Fun and Fitness- Aerobics, Dance forms, Rope Skipping, Hopscotch, Zig Zag and Shuttle Running etc.
Day 2	I. Virtual Assembly – Common Yoga II. Mental Fitness Activities (Ex. Debates, Symposium, Lectures by Sports Psychologists) III. Debates, Symposium, Lectures on "Re-strengthening of the mind post pandemic"– Mental Fitness Activities for Students, Staff and Parents IV. Open letter to Youth of the Nation on "Power of Fitness"
Day 3	I. Brain Games to improve concentration/problem solving capacity – e.g Chess, Rubik's cube etc. II. Poster making competition on theme "Hum Fit Toh India Fit" or "New India Fit India" Preparing advertisements on "Hum Fit Toh India Fit", "Emotional and physical well-being are interconnected" etc.
Day 4	I. Debates, Symposium, Lectures etc about diet & nutrition during pandemic for Students / Staff & Parents II. Essay/Poem Writing Competition on theme "Fitness beats pandemic" Podcast/Movie making on suggested themes – "Get fit, don't quit"; "Mental Health is not a destination but a journey" etc.
Day 5	I. Online Quiz related to fitness/sports II. Virtual challenges for students, staff/ teachers e.g.

	<ul style="list-style-type: none"> o Squats challenge o Step-up challenge o Spot jogging o Rope skipping o Ball dribbling etc <p>III. Session(s) by motivational speakers for students, parents and school staff</p>
Day 6	<p>1 day dedicated to Family Fitness:</p> <p>I. Activities for fitness sessions at home involving students and parents.</p> <p>II. Creatively using home-based equipment for sports & fitness. E.g.</p> <ul style="list-style-type: none"> o Hacky sack at home (juggling with feet & hand – warm up activity) o Aluminium foil inside a sock – ball and any wooden piece – bat to play cricket o Mosquito bat and TT ball to play badminton/tennis <p>Fitness circuit – Draw a ladder on the floor with a chalk piece or crayon</p>

- Individuals
- Organisers must ensure that all “Fit India Cyclothon” events are listed on www.fitindia.gov.in portal and are non-commercial in nature. Further, Individual Participants should also ensure that they register themselves as well.

Guidelins

- Fit India Cyclothon can be organised by any government or private organisation, schools, colleges, universities, individuals, groups, RWAs and communities to create awareness on fitness through cycling.
- Guidelines in relation to COVID-19 issued by the Ministry of Home Affairs and relevant state bodies to be duly complied with.
- To become an organiser, you must register online on gov.in
- As an organiser, you will be responsible for conceptualizing, executing and ensuring a smooth and successful Fit India Cyclothon event to maximize public participation.
- You can invite other organisations as well for online participation registration.
- You can get sponsorship and have partners to organise this event.
- Fit India Mission office will provide standard FIT INDIA design templates for branding elements on the registration portal for organisers to download and use the same:
- Organisers will get FIT INDIA Movement partner – certificate from Fit India.

Other Guidelines For Organisers

- Identify route, create map and share with participants in advance.
- Inform local bodies about the event.
- Prior approval should be taken from relevant authorities wherever required.
- Inform communities around you about Fit India Cyclothon.
- Partner with local businesses who can sponsor FIT INDIA tee shirts / caps for children.
- Any queries regarding Fit India Cyclothon to be sent to Fit India Mission office on: contact.fitindia@gmail.com

Fit India Cyclothon 2020

Fit India Mission will be organising the Fit India Cyclothon from December 2020. Cycling is one of the best ways to remain fit and healthy. It is the new craze that combines fitness with fun and allows us to maintain social distancing. Fit India Cyclothon can be organised by cycling groups, schools, colleges, organisations, councils, panchayats, corporations, societies, RWA’s, NGO’s, special interest groups across India. You can also start a Fit India Cyclothon group by involving your organisation, community, family and friends.

Who can Organise/ Participate in the fit India Cyclothon ?

- Village, Town or City Council/ Panchayat/ Anganwadi / Block
- Your Workplace
- Society or RWA
- Interest Groups
- Corporate and Industry bodies
- Schools/ Colleges and Universities
- NGOs
- Communities

Guidelines For Individual Participants

- Any individual can participate in Fit India Cyclothon to create awareness on fitness through cycling.
- Guidelines in relation to COVID-19 issued by the Ministry of Home Affairs, India and relevant state bodies to be duly complied with.
- To participate, an individual should register online on gov.in.
- As an individual, you will be responsible for conceptualizing, executing and ensuring a smooth and successful Fit India Cyclothon event.
- You can invite other individuals as well for online participation registration.
- Any fitness enthusiast who is participating should strive to motivate at least one partner to participate.
- Registered Individuals will get participation certificate after updating their details on the Fit India portal.

- For any queries, contact on contact.fitindia@gmail.com

Other Guidelines For Individuals

- Identify route.
- Inform communities around you about the Fit India Cyclothon.

Conclusion

Fit India Movement given new platform to all Indians. This scheme includes number of Indigenous Games like Akhada kusti, Tug of War, Thang Ta, Kalaripayath, Kho- kho, Mallakhamb, Hekko, Sqay, Chhau and PaikaAkhada, Kabaddi, Shooting ball, Lagori and Langdi, Gatka, Rollball, Dhoop and Cawrie Khel, Silambam, Sikkim archery, GilliDanda ext.

This movement has given fitness mantra to all Indian citizens.

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OVERVIEW OF KHELO INDIA SCHEME

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ABSTRACT

The present study is an attempt to explore the overview of khelo India scheme/policy. Games and Sports had historically played a significant role in the development of personality traits qualities such as discipline, tolerance and leadership amongst the youth. With ample support, planning and pivot implementation, immense potential of the India's youth can be profitable channelized through sporting activities. The program strives to promote "Sports for Excellence" as well as "Sports for All". This is done with the help of various online sources such as research articles, websites, newspapers and Google scholar. In the current study we discussed about the overview of this policy, its aims at improving India's sports culture at the grass-root level, talent identification, structured sporting competitions, infrastructure development, finding's to states in three years, its achievements in all the editions and how this policy is contributing towards the economy of the nation.

Keywords: Khelo India, Talent identifications, Infrastructure, Funding, Achievements

Introduction

Sports and games have traditionally played a major role in development of temperament traits and qualities like discipline, tolerance and leadership amongst the youth. With adequate support, designing and targeted implementation, vast potential of the India's youth is gainfully channelized through sporting activities. The belief of their true potential won't solely build future character, however could be a passage of national integration, More importantly, our top sportsmen come from diverse parts of the country, many with limited sports infrastructure, thus indicating huge unexplored potential.

The Khelo India program has been acquainted with restore the games culture in India at the grass-root level by building a solid system for all games played in our country and set up India as an incredible brandishing country.

National Programme for Development of Sports, Khelo India, aims at improving India's sports culture at the grass-root level through organized talent identification, structured

sporting competitions and infrastructure development. Khelo India is a national level sports competition to encourage young players from urban and rural school/areas across the country. Invalid source specified. It is a Government of India programme launched in 2016-17 under the tenure Prime Minister Narendra Modi and Sports Minister's Vijay Goel and Rajyavardhan Singh Rathore. Invalid source specified.

The Khelo India Plan, with twelve verticals, is being executed the nation over from the year 2017-18 onwards. The Talent Search and Development vertical of Khelo India scheme provides for grant of financial assistance of Rs.5.00 lakh per annum for a period of 8 years for selected sportspersons. 2437 sporting talents across 20 sports disciplines have been selected under Talent Search & Development programme out of which financial assistance has been given to 2433 athletes. (PIB)

Year-wise and State-wise details of sporting talents identified under the Khelo India Scheme

S.No.	Name of the State	No of beneficiaries		
		2018-19		2019-20*
1	Andaman & Nicobar	16		16
2	Andhra Pradesh	41		54
3	Arunachal Pradesh	8		8
4	Assam	36		38

S.No.	Name of the State	No of beneficiaries		
		2018-19		2019-20*
5	Bihar	9		10
6	Chandigarh	27		33
7	Chhattisgarh	21		25
8	Daman & Diu	3		4
9	Delhi	176		206
10	Goa	14		14
11	Gujarat	63		83
12	Haryana	292		360
13	Himachal Pradesh	13		27
14	Jammu & Kashmir	14		19
15	Jharkhand	22		25
16	Karnataka	119		134
17	Kerala	81		103
18	Madhya Pradesh	52		67
19	Maharashtra	251		303
20	Manipur	85		90
21	Meghalaya	3		3
22	Mizoram	24		25
23	Odisha	46		50
24	Puducherry	2		3
25	Punjab	144		173
26	Rajasthan	56		76
27	Sikkim	2		2
28	Tamil Nadu	94		130
29	Telangana	52		67
30	Tripura	8		8
31	Uttar Pradesh	119		147
32	Uttarakhand	26		37
33	West Bengal	82		93

(PIB)

Khelo India Projects

The Khelo India scheme in its present form started in October, 2017 with a total budget allocation of Rs. 1756 crore. Under this scheme, State wise budget allocation is not

made and projects are sanctioned based on their viability. Funds are released project wise. Information relating to number of projects sanctioned and funds released State wise is below:

S. No.	Name of State/UTs	2016-17	2017-18	2018-19
1	Andhra Pradesh	6.50	4.00	-
2	Arunachal Pradesh	2.50	15.25	39.50
3	Assam	3.50	15.20	6.32
4	Chhattisgarh	-	2.50	-
5	Gujarat	2.50	5.50	-
6	Goa	-	-	3.00
7	Haryana	2.00	12.50	6.95
8	Himachal Pradesh	-	-	2.50
9	Jammu & Kashmir	1.80	1.00	-
10	Jharkhand	1.00	1.07	-
11	Karnataka	9.80	12.50	9.50
12	Kerala	2.50	3.00	4.00
13	Madhya Pradesh	3.50	10.50	4.14
14	Maharashtra	4.00	7.00	19.87
15	Manipur	-	5.29	9.00
16	Mizoram	2.00	4.30	-
17	Nagaland	-	2.00	5.00
18	Odisha	2.50	11.56	0.69
19	Punjab	4.64	6.00	-
20	Rajasthan	5.44	36.12	11.36
21	Sikkim	-	-	3.00
22	Tamil Nadu	-	7.00	-
23	Telangana	2.00	6.50	4.00
24	Tripura	-	2.50	-
25	Uttarakhand	4.00	9.30	1.00
26	Uttar Pradesh	1.50	15.00	43.43
27	West Bengal	-	6.50	-
28	Puducherry	4.46	-	3.00
29	Delhi	-	16.08	-
TOTAL		66.14	218.17	176.26

(PIB)

Khelo India games (2018-2019)

Khelo India Youth Games (KIYG), previously Khelo India School Games (KISG), means khelo India Youth Games, held every year in January or February, are the public level multidisciplinary grass root games in India held for two classes, to be specific under-17 years school understudies and under-21 undergraduates. Consistently best 1000 children will be given a yearly grant of ₹5 lakh (US\$7,000) for a very long time to set them up for the worldwide games. On 31 January 2018, Prime minister, Narendra Modi, initiated Khelo India School Games at the initial service dependent on Guru shishya custom held at Indira Gandhi Field. from the 2019 occasions, Khelo India School Games were renamed to Khelo India Youth Games after Indian Olympic Affiliation went ahead board before in September 2018. The second version of the occasion was commenced in Shree Shiv Chhatrapati Sports complex, a games complex arranged in Balewadi, Pune, by Sports minister, Rajyavardhan Singh Rathore, and, chief miniter of Maharashtra, Devendra Fadnavis. (khelo India)

Haryana (102 awards including 38 golds, 26 silvers and 38 bronzes) which is viewed as a games force to be reckoned with was the top group in 2018, trailed by Maharashtra (111 decorations including 36 golds) and Delhi (94 decorations including 25 golds).

And in 2019 Hosts Maharashtra walked away with the Overall Trophy at the Khelo India Youth Games, as they amassed a mammoth 85 **gold**, 62 **silver** and 81 **bronze** for a total of 228 medals. (khelo India)

Khelo India youth games 2020

The third Khelo India Youth Games was held from 10 January 2020 to 22 January 2020 in Guwahati, Assam, India. The occasion will observer 20 national level multidisciplinary grassroots games to get played among the age gatherings of under-17 and under-21 classes. Maharashtra safeguarded its title as they beat the award count with 78 Gold decorations, 77 Silver decorations and 101 Bronze awards. The triumphant unexpected of Maharashtra additionally broke their past record of all out decoration take of 228 awards made at Pune, by winning an aggregate of 256 awards. (khelo India Youth Games)

Sports event			
<u>Archery</u>	<u>Cycling</u>	<u>Kabaddi</u>	<u>Table tennis</u>
<u>Athletics</u>	<u>Football</u>	<u>Kho-Kho</u>	<u>Tennis</u>
<u>Badminton</u>	<u>Field hockey</u>	<u>Lawn bowling</u>	<u>Volleyball</u>
<u>Basketball</u>	<u>Gymnastics</u>	<u>Shooting</u>	<u>Weightlifting</u>
<u>Boxing</u>	<u>Judo</u>	<u>Swimming</u>	<u>Wrestling</u>

Khelo India University games (2020)

Khelo India University Games (KIUG), is a national level multi-sport event held in India, where athletes from universities across the country compete in different sport disciplines. The inaugural edition held in Odisha started on 22 February and concluded on 1 March 2020. It is organised by Sports Authority of India (SAI) and Ministry of Youth Affairs and Sports along with Association of Indian Universities, Indian Olympic Association and National Sports Federation. It is the largest university level sports competition in India

The 2020 edition was held from 22 February to 1 March 2020 includes 211 events in 17 sports. The sport events were held at Kalinga Institute of Industrial Technology (KIIT) in Bhubaneswar, JNL Indoor Stadium, SAI-Odisha Badminton Academy and SAI International Residential School in Cuttack.

More than 4000 athletes from 176 universities participated in the events. The numbers of medals include 206 Gold, 206 Silver and 286 Bronze. Fencing and Rugby were included for the first time in a Khelo India competition.

Panjab University finished first with 46 total medals that included 17 gold, 19 silver and 10 bronze medals. Savitribai Phule Pune University and Punjabi University were second

and third with 37 and 33 total medals respectively. National record-holding sprinter, Dutee Chand participated representing KIIT. She won two gold medals in 100m and 200m events. Siddhant Sejwal of Panjab University and Sadhvi Dhuri of Pune University were the top performers with five gold medals each. (Khelo India university Games)

Major achievements

- 1) The Khelo India scheme under Ministry of Youth Affairs & Sports has been running successfully across the country since it was launched. The details of major achievements are given below:
- 2) The Budgetary allocation at Revised Estimate stage for Khelo India scheme during 2018-19 was Rs. 500.09 crore. In 2018-19 a sum of Rs.199.31 crore was released to States / Union Territories for bridging gaps in sports infrastructure and holding sports competitions against the projects sanctioned by this Ministry. A sum of Rs. 10.00 lakhs was released for conducting sports activities under 'Sports for Peace and Development' component of Khelo India scheme to Telangana State. State / Union Territories wise information is given:
- 3) 133 new sports framework projects affirmed in 27 States/Union Territories at an absolute authorized expense of Rs.826crore.
- 4) The first Khelo India School Games (KISG) 2018 were effectively directed from 31st January to eighth February 2018 in New Delhi with support of 3507 competitors
- 5) The second edition of Games, for example 'Khelo India Youth Games Maharashtra, 2019' was effectively led in Pune from ninth January to twentieth January, 2019 with cooperation of 5925 competitors.
- 6) 2437 sporting abilities across 20 games disciplines have been chosen under Talent Search and Development.
- 7) A complete of 99 Academies (SAI, State Government/Central Government and Private) have been certify for the preparation of the Khelo India competitors (KIAs).
- 8) Khelo India Mobile Application was successfully launched to enable the general public to get information and ease of access to the various aspects of the game (HOW TO PLAY), available playfields across India (WHERE TO PLAY) or mapping the fitness parameters of the young school going population of the country.
- 9) First National level Training of Trainer Program (TOTs) for Central Board of Secondary Education (CBSE) Teachers was held and 198 Physical Education Teachers prepared are Certified as Master Trainers. All out 30 Regional/State Level TOTs have been led where an absolute number of 1547 Certified Regional Trainers were prepared.
- 10) Under Physical Fitness of School Going Children segment, 1168 Schools and 23,947 Assessors are enlisted. For actual wellness appraisal, 2, 70,821 understudy profiles have been made in the Khelo India Mobile App and out of which 92,583 quantities of evaluations have been made.
- 11) A help of Rs. 3 crore had been given to Boxing Federation of India to direct The International Boxing Association (AIBA)World Women Boxing Championship 2018 held at New Delhi from fifteenth to 24th November, 2018.
- 12) 2,124 learners are covered under 18 State Level Khelo India Centers of Sports Authority of India.
- 13) Rs.23.05 crore was authorized for conducting brandishing exercises in 13 States during 2018-19 under the Khelo India vertical 'Sports for Peace and Development'.
- 14) Ajaya Mahajan, chairman, Sports Goods Manufacturers and exporters association (SGMEA) attributes this growth to the Khelo India initiative. He said, "There is a lot of improvement in the growth of carbon fibre racquets, carbon fibre hockey sticks, cricket protective equipment and boxing equipment. Schools are a reason for domestic market pickup and people increasingly becoming sports-oriented because of Khelo India."
- 15) Vikas Gupta, managing director at Jalandhar-based Soccer International Private Ltd. said, "There is big-time

investment happening in sports infrastructure such as stadiums. This has a gestation period. However, schools have become big buyers as now kids have to participate in sports. There is a 5-10% increase in business.”

16) The increased participation of school-going children in sports is at the core of sudden and unbelievable growth in the sports economy of Jalandhar. This is where the Khelo India initiative comes into the picture. (TIFIPOST)

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ASHTANGA YOGA AS AN IMPETUS TO IMPROVING SPORTS PERFORMANCE**K.K. Swathy¹ and V.M. Robin²**

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Yoga is an inalienable part of Indian tradition and an ancient asset to the entire mankind, from its very origin it was meant to provide peace of mind, physical wellbeing and spiritual enlightenment to those who practise it. It has also got both preventive and therapeutic benefits and offers both physical and mental benefits. All sports necessitate a tremendous amount of energy, spirit, concentration, and dedication to reach peak performance. At any point in life, having a healthy body and a balanced mind is the key to success, and yoga is one practise that will help you achieve both. Yoga is unique from other techniques as it enhances strength and various motor components without inducing stress. To achieve and accomplish the results 50 yoga practising athletes were selected using randomised purposive sampling technique. SPSS 16 was used to analyse the data, t-test was used for analysis and paired t-test was used for differentiating between control and experimental groups. The results revealed that Ashtanga yoga training enhance cardiorespiratory endurance.

Keywords: Ashtangayoga ,Inalienable, Therapeutic, Spiritual

Introduction

Yoga is a collection of asanas that are paired with breathing exercises to help the body develop strength and stamina while also balancing the mind and thoughts. Yoga, unlike other forms of physical activity such as aerobics, allows for not only physical but also mental and spiritual well-being. Yoga is an ancient Indian tradition that has spread throughout the world for thousands of years. Yoga is a practise that aims to bring balance to the body, mind, and spirit. Yoga practise will assist you in achieving better outcomes. This is especially true when athletes have pushed their bodies to their limits and suffered injury or fatigue as a result. Yoga can assist in the strengthening and healing of a weakened body. Yoga postures, breathe pranics, and massage can help to rebalance, strengthen, and heal overworked muscles, joints, and ligaments. Athletes who go through this restoration process will prolong their careers and develop an inner balance that will last a lifetime. Yoga is focused on the concept of mind, body, and spirit balance. It is thought to be the proper way to treat one's body. It has many layers, each of which will aid athletes in improving their performance. The eightfold disciplines, also known as the eight "limbs" of yoga, are a collection of practises that refer to all aspects of yoga. The teachings and practises of yoga's healing system are based on four fundamental principles. The first idea is that the human body is a holistic structure made up of

different interconnected aspects that are inextricably linked to one another, and that the wellbeing or disease of any one dimension has an effect on the others. The second theory is that individuals and their needs are special. As a result, they must be approached in a way that recognises this uniqueness, and their practise must be personalised accordingly. The third theory is that yoga empowers the student to be their own healer. Yoga involves the patient in the healing process; by taking an active role in their wellbeing experience, the healing comes from inside rather than from an outside source, and the student gains a greater sense of control. The fourth theory is that a person's mental health and well-being are critical to their recovery.

The eight limbs of Ashtanga yoga, described as practices:

1. Yama (control): A set of don'ts in touch with the outside world that keep your relationships and energy in check, allowing you to meditate deeply in a peaceful environment. Nonviolence, sincerity, integrity, sexual continence, forbearance, fortitude, compassion, straightforwardness, dietary moderation, and bodily purity are among Yama's disciplines.

2. Niyama (conduct rules): A set of actions that aid detachment from the environment and the self, making it easier to let go of the doer in deep meditation. Austerity, contentment, belief in God, charity, reverence of God, study of teachings and scriptures, humility, having a discerning mind, repetition of prayers (japa),

observance of promises, and performance are all examples of Niyama activities

3. Asana (posture): Many postures have been identified, in which at least one sitting posture must be mastered in order to achieve a deep state of meditation, since a motionless body makes the mind quiet, and an unstable body cannot remain motionless in deep meditation.

4. Pranayama (control of breath): Control of breath brings mind under control, while the main aim is to store the energy that will be needed when in deep meditation breathing has stopped.

5. Pratyahara (withdrawal of sensory perceptions): Taking your mind away from sensory feedback so that it doesn't interfere with your meditation. This may be accompanied by an emphasis on purifying sensory information, such as by rituals or the use of meditative sounds, for example. Prana is eventually removed from the nadis, which transport sensory information.

6. Dharana (concentration): The concentration of the mind on a single entity, such as mantras, or deep concentration on the six subtle centres of the chakras, beginning with the first and progressing to the seventh, and so on.

7. Dhyana (uninterrupted meditation): In which the focus is uninterrupted, with no distracting thoughts, despite the fact that this concentration still takes effort.

8. Samadhi (effortless meditation, absorption, equilibrium): It is possible to sustain concentration without exerting any effort.. This stage allows for a lengthy purification process in which the human consciousness dissolves into pure cosmic consciousness. There is no need to practise samadhi after a long period of time because the conscious bond to the divine is permanent.

Major factors affecting performance

1. Fatigue
2. Lack of strength
3. Lack of flexibility
4. Lack of endurance

Benefits of yoga on Sports Performances

1. Removal of Fatigue

Fatigue is described as tiredness combined with a lack of energy, as well as physical or mental fatigue or a lack of motivation. Fatigue

impairs a person's physical and mental ability to perform specific tasks. It is common in people who do strenuous work, and it's particularly noticeable in athletes who push themselves beyond their limits of endurance. Yoga poses assist in the natural restoration of resources. Yoga is an important fatigue therapy since it blends movement, rest, and stress reduction with prana (life force energy) cultivation and parasympathetic nervous system activation. Yoga, which incorporates the tools of yoga postures, breathing exercises, and meditation to help clear the brain fog and body exhaustion, is an effective therapy for fatigue. These postures help to clear blocked energy channels, improve blood circulation, stretch the body, and reduce fatigue while also increasing vitality.

2. Improving strength

When you practise yoga, your body is placed in certain positions and orientations that you must help with your muscles. And you're working out with weights. Muscle tone and size increase as a result of these exercises. When it comes to developing a better, more impressive body, yoga can be just as successful as lifting weights. Yoga exercises involve the whole body rather than isolating individual muscles. Holding yoga poses for longer periods of time is one of the simplest ways to gain strength quickly without using any tools, and it also helps us to track our progress.

3. Improving flexibility

Yoga allows muscles to be extended and lengthened in a healthy and effective manner. Yoga works not just the muscles but also the soft tissues of the body, resulting in less lactic acid build-up, which is responsible for stiffness in different parts of the body. Yoga improves joint lubrication and increases the range of motion of the less utilised inner muscles. Hence the more flexible body is obtained which is able to perform task easily.

4. Improving Endurance

Breathing exercises and asanas increase stamina when practised regularly. Pranayama raises lung capacity by lengthening inhalations. As a result, the body receives more oxygen, which improves overall performance and productivity.

Methodology

A total of 50 subjects aged between 20 to 25 years were selected using randomised purposive sampling technique. Among 50 subjects 25 were taken as experimental group and 25 were taken as control group. Experimental group was given yoga training for 6 weeks. The subjects underwent tests before and after the training. The training included a systematic training schedule which included a set of asanas and pranayamas

.Cardiorespiratory endurance was analysed by conducting distance runs.

Statistical technique

T test was applied using SPSS 16.

Level of significance 0.05.

Results

The result of the study revealed that the cardio respiratory endurance was seen higher in the experimental group when compared to controlled group in post test due to yogic training programme.

Table 1

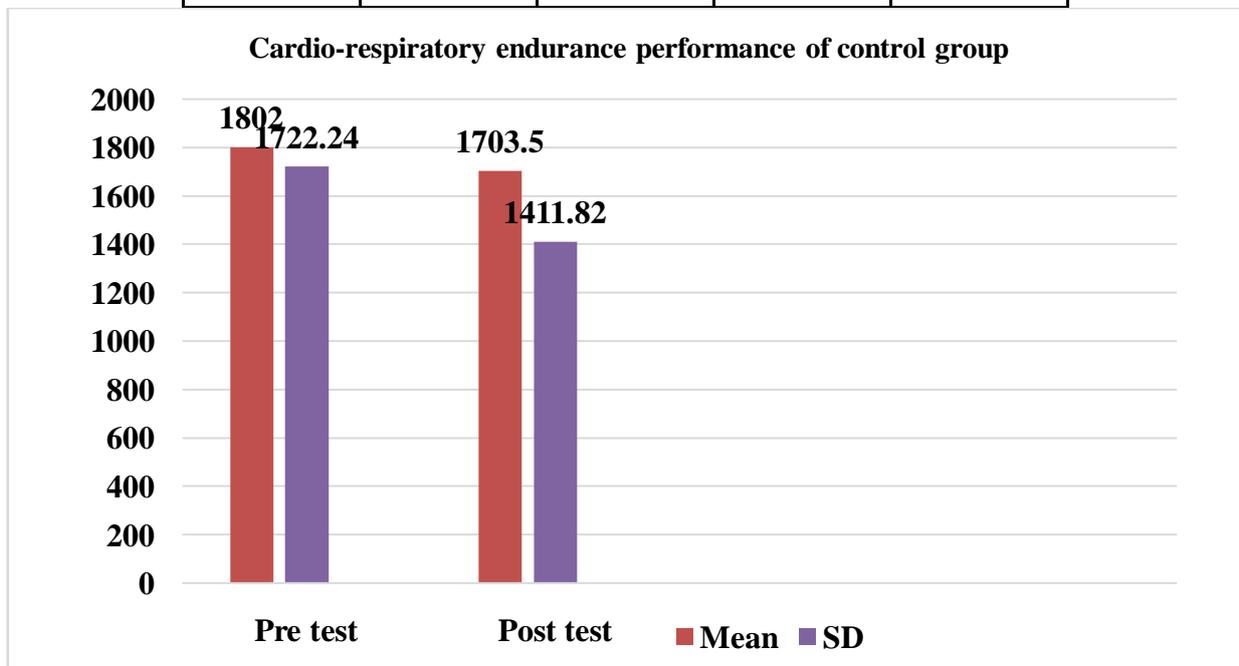
Pre test and Post test Performance difference of Cardio respiratory endurance in Control group

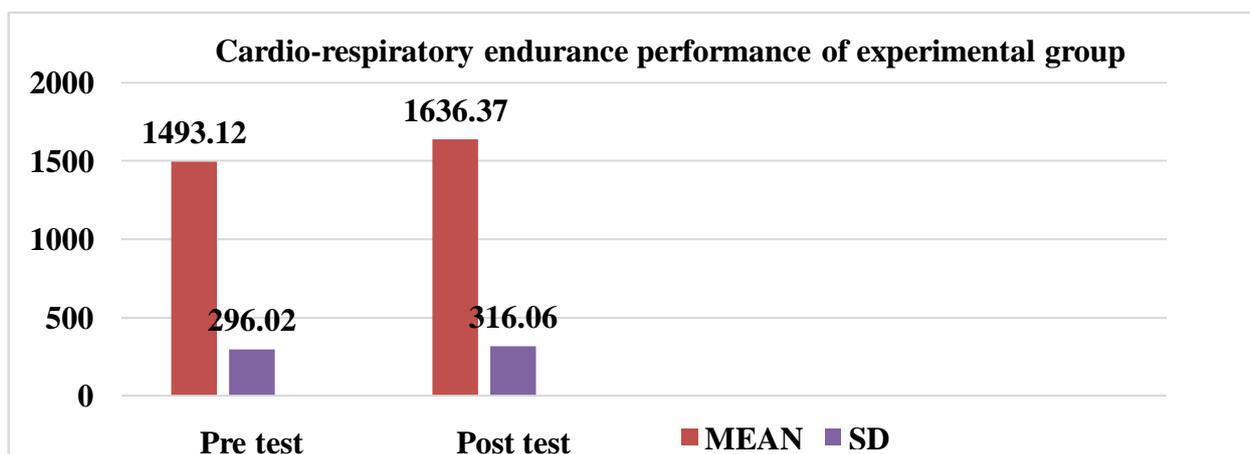
Group	Mean	Sd	Dm	T Ratio
Pretest	1803	1722.24	196.75	3.40*
Post test	1606.25	1411.82		

Table 2

Pre test and Post test Performance difference of Cardio respiratory endurance in Experimental group

Group	Mean	Sd	Dm	T Ratio
Pretest	1493.12	296.02	143.25	5.23*
Post test	1636.37	316.06		





Discussions on findings

The Cardio Respiratory Endurance of the experimental group was found to be substantially greater than that of the control group. In the case of groups experimental and control, the Pre Test and Post Test conclusions have revealed major differences. It's possible that the improvement in the experimental group is due to their exercise schedule, while the improvement in the control group is due to previously acquired skills or some other factor, such as daily routine life activities, that causes

an individual's functioning capacity to improve. Based on the results it is concluded that six weeks yogic training programme found significant improvement in cardiovascular endurance and showed that the experimental group's cardio respiratory endurance was higher than the control group.

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