

## **EFFECT OF EIGHT WEEKS OF FITNESS PROGRAMME ON SKILL RELATED FITNESS COMPONENTS OF SCHOOL GOING CHILDREN**

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### **ABSTRACT**

The purpose of the present study was to compare the effect of eight weeks of fitness programme on skill related fitness components of school going children. The sample was collected as school children studying at Senior Secondary Schools of Kulgam District of Jammu and Kashmir. 40 children were selected for the purpose of the study. The age of the sample were ranged between 15 to 17 Years. Speed were measured with the help of 50 Yard Dash Test. Reaction time were measured with the help of Nelson Hand Reaction Time Test. Agility were measured with the help of Shuttle Run Test. Balance were measured with the help of Modified Bass Dynamic Balance test. Power were measured with the help of Vertical Power Jump. Coordination were measured with the help of Dodging Run Test. Random group experimental design was employed in this study. The subjects were divided into four groups, viz. (A) Experimental Group, (B) Control Group. Each group consisted of twenty subjects. To find out the significant effect of eight weeks of fitness program on skill related physical fitness of school children t -test was employed to compare mean difference between the pre-test and post-test scores. The results of the study revealed that the significant effect of fitness training program was observed on selected skill related fitness components for school going children i.e. Speed , Agility. Balance, Coordinative Ability. Power, Findings of the study also indicated the insignificant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Reaction Time (Nelson Hand Reaction Time) for school going children were compared.

**Keywords:** Skill related fitness, Physical fitness, School Children, Training.

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## INTRODUCTION

Human beings by nature are competitive and aspire for excellence in every given field. Sport is not an exception. Not only individuals but nations also want to show their supremacy in the field of sports. This friendly rivalry has inspired and motivated all too sweet and strive, to run faster, jump higher, throw longer and exhibit greater strength, endurance and skill in the competition. Sports play a major role in the lives of practically every one the players, the coaches, the officials and the spectators.

Much of the attraction of sports comes from the wide variety of experiences and feelings that result from the participation-joy, anguish, success, failure, exhaustion, pain, relief, a feeling of belonging. Sports can bring money, glory, status and good will. However, sports can also bring tragedy, grief and even death.

In fact sports entered a new horizon of sporting culture, leading to the emergence of sports sciences as the backbone of performance sports. This brought into sharp focus the training system as the means of development of sports performance. Now the coaches are striving to get optimum performance with minimum expenditure of energy and time. The players and athletes are trained on scientific guide lines (Singh, 1991).

The National Education Policy which was established by the Govt. of India in 1985 also gave adequate importance to the program of physical education and physical fitness at the institutional level and stipulated the every educational institution should have adequate sports facilities and scientific program to enable every school going child to participate in games and sports and fitness activities of his/her own choice (Uppal, 1992).

The aims and objectives of physical education depend to a great extent on the political, economic and social changes that take place in a society. India has achieved political freedom and chosen to become a secular democratic re-public. This means that physical education must make its contribution to the development of such qualities of body; mind and character as well enable our pupils in schools to develop and grow to be worthy citizens of a great new democracy.

Physical fitness is a matter of fundamental importance to individual wellbeing and to the progress and security of a nation. It is the basis for all other forms of excellence. With increased mechanization there has been a corresponding decrease in the number of tasks that require an expenditure of energy. Sufficient vigorous exercises are not done to develop and maintain adequate level of physical fitness. Individuals must rely on various forms of exercises to attain an acceptable level of physical fitness (<http://www.sharecare.com.>, 2014)

The component of skill-related fitness called reaction time is the amount of time it takes for a person to respond to a stimulus. The stimulus is often sight, sound, or touch. When measuring reaction time, the amount of time from presenting the stimulus to the first muscle movement afterward is recorded. An example is the elapsed time from the sound of a race starting gun to the runner starting to run.

The components of skill-related fitness may not have a direct effect on improving health, but often make a person more proficient in health-related fitness activities as well. For instance, power may enhance a person's endurance for cardiovascular activities with proven health benefits. They also tend to enhance a person's performance in sports and other general activities of daily living ( <http://www.sharecare.com.>2014)

Clarke (1981) has expressed that physical educators must recognize the basic needs of physical fitness for boys and girls under their charge and with this recognition should come a determination to formulate and conduct a sound and effective physical fitness program for them.

Bucy (1965) showed that all the groups improved significantly in physical fitness, strength and weight. The isometric exercise group had significantly greater strength than the callisthenic exercise group.

Singh (1992) revealed that both the training programs (Rope Skipping exercise and Step-up exercise) have not got significant effect on cardio-respiratory endurance.

Wilson (1993) indicated that the experimental group which trained with the load maximised mechanical power achieved the best overall results in enhancing dynamic athletic performance recording statistically significant ( $P < 0.05$ ) improvements on most test items and showing statistically superior results from the two other training modalities on the jumping and the iso kinetic test.

Kraemer et. al. (...) demonstrated that only Group A and Group B made significant ( $p < 0.05$ ) improvements in the load bearing performance task. Groups A, B, and D improved all components of their APFT scores while Group C improved in push ups and sit ups only. The results of this study suggest that a combination of running and resistance training is necessary to improve short duration, high intensity load bearing performance.

Twist, (2008) indicated that there is a latent impairment of balance performance following a bout of plyometric exercise, which has implications for both, with greater loss of force at the lower angular use of skill-based activities and for increased injury risk following high-intensity plyometric training.

The estimation and improvement of the skill related physical fitness of youths should become an important part of every secondary-school program. It seems particularly wise in these days to make a testing program as brief and yet as helpful as possible. The ability to perform certain activities which require all the above six components and skill is also important and it is desirable to test and subsequently to attempt to teach or improve them. Therefore, realizing the importance of skill related physical fitness in school going the present study has been taken by the research scholar.

The purpose of the present study was to compare the effect of eight weeks of fitness programme on skill related physical fitness of school children. It was also hypothesized that there may be significant difference in the selected skill related physical fitness variables, following the eight weeks of fitness programme on skill related physical fitness of school children.

## METHODOLOGY

### Sample:

The sample was collected as school children studying at Senior Secondary Schools of Kulgam District of Jammu and Kashmir. 40 children were selected for the purpose of the study. The age of the sample were ranged between 15 to 17 Years. Their fitness was considered according to school medical report and their age was verified by the school register.

### Criterion measures:

Speed were measured with the help of 50 Yard Dash Test. Reaction time were measured with the help of Nelson Hand Reaction Time Test. Agility were measured with the

help of Shuttle Run Test. Balance were measured with the help of Modified Bass Dynamic Balance test. Power were measured with the help of Vertical Power Jump. Coordination were measured with the help of Dodging Run Test.

### **Design of Study:**

Random group experimental design was employed in this study. The subjects were divided into four groups, viz. (A) Experimental Group, (B) Control Group. Each group consisted of twenty subjects. The groups were administered initial tests related in Skill related physical fitness such as Speed, Reaction Time, Agility, Balance, Power and Coordination. After the initial test, the training programme were administered to the Experimental Group whereas no training was administered to the control group. The training was administered for a period of eight weeks, thrice a week in a progressive manner. The final test was administered on the selected variables under similar condition after eight weeks of training.

### **Fitness Training Program:**

The Fitness training program was formulated with the help of expert and guide

#### **Cardiovascular Training**

Frequency: 3 times per week including one day of interval training. Intensity: Heart Rate recommended in the Target Heart Rate Zone. Time: 60 minutes. Type: Aerobic activity such as jogging, Callisthenic exercises, etc. Subjects were made to do circuit run: run, stop and do pushups, run, stop and do abdominal exercises; run and practice jumping 5 feet distances.

#### **Resistance Training**

Frequency: 3 times per week .Intensity: 2-4 sets per session. Repetitions vary with each exercise. Time: Rest interval between sets were between 45-90 seconds. Type: Exercise were done with free weights. This program included a "total body" workout using major muscle groups.

The experimental group met six days per week i.e., Monday, Wednesday and Friday for Cardiovascular Training and Tuesday, Thursday and Saturday for the period of eight weeks for Resistance Training. Sunday was considered as rest day. Each experimental session was of 60 minutes duration. The training schedule was repeated for two weeks block and after that the load was re-adjusted. The control group did not go under any specific training except the testing program.

Prior to any workout it is important to complete a warm-up. A warm-up was designed to prepare the body of the subjects for efficient and safe functioning of heart, blood vessels, lungs and muscles during vigorous exercise. A good warm-up helped to reduce any joint soreness that may be experienced during the early stages of an exercise program. A proficient warm-up included 5-10 minutes of low-intensity aerobic activity, such as brisk walking, and slow jogging. After that the subjects were given dynamic warm-up. 5-10 minutes of low-intensity activity was given to increase muscle temperature, oxygen to working muscles, and to improve muscle elasticity; and to create movement patterns for upcoming activity. Prior to start of training program for Cardio vascular training group their target heart rate was fixed.

Target Heart Rate Zone: The intensity at which the subjects were trained was determined by the percentage of maximal heart rate as per their age and gender. The target heart rate zone is used to determine the intensity. They were established by predicting the maximum heart rate for their age group. This method was developed by "KARVONEN".

Any activity that raises the heart rate 60-70 percent of maximum is considered moderate intensity and offers many health benefits. To have an effect on cardiovascular fitness, activity must raise the heart rate so it is in the 60-90 percent range. In this method first I have calculated HRR. HRR is nothing but the difference between the Resting Heart Rate (HR rest) and Maximum Heart Rate (HR max). The mean resting Heart Rate of the subjects were found as 72 beats/min. the maximum heart rate is 220 beats/min.

$$\begin{aligned}\text{Therefore HRR} &= (\text{HR max}) - (\text{HR rest}) \\ &= 220 - 72 \\ &= 148.\end{aligned}$$

Hence, Target heart rate (THR) was determined as a percentage of the HRR plus the HR rest. Therefore the THR selected for present study was 80% of the HRR which was calculated as below:

$$\begin{aligned}80\% \text{ of THR} &= (.80 \times 148) + 72 \\ &= 118.4 + 72 \\ &= 190.4\end{aligned}$$

Therefore 80% of the intensity + 190 beats/min.

Therefore the intensity zone was fixed from 65% to 80%.

**TABLE 1 INTENSITY ZONE**

| <b>Week</b> | <b>Monday<br/>Intensity / Time</b> | <b>Wednesday<br/>Intensity / Time</b> | <b>Friday<br/>Intensity / Time</b> |
|-------------|------------------------------------|---------------------------------------|------------------------------------|
| <b>1</b>    | 65 - 75% / 15 min                  | 65 - 75% / 15 min                     | 65 - 75% / 15 min                  |
| <b>2</b>    | 65 - 75% / 16 min                  | 65 - 75% / 16 min                     | 65 - 75% / 16 min                  |
| <b>3</b>    | 65 - 75% / 18 min                  | 65 - 75% / 18 min                     | 65 - 75% / 18 min                  |
| <b>4</b>    | 70 - 80% / 20 min                  | 70 - 80% / 20 min                     | 70 - 80% / 20 min                  |
| <b>5</b>    | 70 - 80% / 20 min                  | 70 - 80% / 20 min                     | 70 - 80% / 20 min                  |
| <b>6</b>    | 70 - 80% / 22 min                  | 70 - 80% / 22 min                     | 70 - 80% / 22 min                  |
| <b>7</b>    | 75 - 85% / 18 min                  | 75 - 85% / 18 min                     | 75 - 85% / 18 min                  |
| <b>8</b>    | 75 - 85% / 20 min                  | 75 - 85% / 20 min                     | 75 - 85% / 20 min                  |

### **Resistance Training:**

Exercises and activities that tax the muscles beyond their normal capacity help to improve muscular strength and endurance. Activities of daily living like heavy yard work, raking and carrying leaves, shoveling snow, and chores around the house all contribute to healthy musculoskeletal fitness.

Structured programs from simple calisthenics to resistance training routines using various kinds of equipment are particularly effective in training and improvement of Fitness. A program was designed in consultation with experts considering the below important points.

Number of exercises- 8 - 10 exercises. Order of exercises- Exercise for large muscle groups were given before smaller muscle groups (e.g. chest before triceps). Alternate push with pull exercises (example: push-up/pull-up or abdominals/lower back). Most of the

exercise were involved with multi-joint movements. Repetition - One complete action of an exercise. Set - A predetermined number of repetitions completed one right after the other. Resistance – It was determined by the body weight or the weight of the equipment that the subjects used (e.g. dumbbell, barbell, etc.). Rest/Recovery - The amount of rest taken between sets of an exercise, between different exercises, or between training sessions was incomplete. Frequency - The number of training sessions completed in a specified period of time. Progression Overload-A gradual and progressive increase in the difficulty of the program in some capacity, to continue to challenge the muscles. This was achieved by overload Techniques- Increasing the amount of weight lifted; Increasing the repetitions in a set; Increasing the number of sets; and Decreasing the rest period between sets. Progression guidelines- Progression was achieved by increasing one variable at a time; Decreasing repetitions when a set is added; Increasing resistance when able to complete more repetitions than recommended; and Not overloading or lifting to maximal ability during every workout.

### **Eight -Week Resistance Training Program:**

This program included 8 strength training exercises for the major muscle groups. Frequency: 3 times per week (every other day)

**1: Dumbbell Swing- Objective: Power. Description:** Subjects were asked to keep head up (eyes forward), back straight and abs engaged (tight). Hold a dumbbell with both hands between legs to start. Using legs and torso, keeping arms straight, swing the weight up above head. Allow the dumbbell to return to the initial position in a controlled manner and repeat the exercise. Number of sets: 2-3. Number of repetitions:10 (Weight was increased when exceeding 10 repetitions)

**2: One Leg Split Squat with Dumbbell- Objective: Single Leg Work. Description:** A squat was performed with one foot on the floor and the other on a bench. Back was asked to be kept straight and abs engaged (tight), head neutral and eyes looking forward. Dumbbells were held in each hand. Number of sets: 2-3. Number of repetitions: 10 on each side (Increase weight when exceeding 10 repetitions).

**3: Chin-ups Medium Grip- Objective: Upper Body Vertical Pull. Description:** Using a suspended bar, subjects were asked to pull-up their body weight until chin slightly goes beyond the bar. Abdominal engaged (tight) and trunk rigid during the exercise. Number of sets: 2-3. Number of repetitions: 5+ (Assistance were given as and when required (e.g. elastic, partner assistance, jumping chin-up or step up with a bench and lower their body in a controlled manner).

**4: Dumbbell Bench Press- Objective: Upper Body Horizontal Push. Description:** Subjects were asked to keep abdominals engaged (tight), and back flat on the bench. Dumbbells were held and lowered the weight until the elbows reach a 90-degree angle, keeping forearms perpendicular to the ground. Then were asked to return to the starting position and repeat. Number of sets: 2-3. Number of repetitions: 10 (Increase weight when exceeding 10 repetitions).

**5: Dumbbell Row- Objective: Upper Body Horizontal Pull. Description:** Subjects were asked to keep back straight and head in a neutral position aligned with the back. They were asked to pull dumbbell towards the trunk, keeping the elbow close to the trunk and repeat the same. Number of sets: 2-3. Number of repetitions: 10 on each side (Weight was increased when exceeding 10 repetitions).

**6 : Dumbbell Biceps Hammer Curl and Shoulder Overhead Press-** Objective: Upper Pull and Vertical Push. Description: Subjects were asked to keep back straight, abdominals engaged (tight), knees bent and feet shoulder width apart. Using a neutral/hammer grip (palms inward), the subjects were asked to perform a biceps hammer curl followed by an overhead shoulder press. Number of sets: 2-3. Number of repetitions: 10 on each side (Weight was increased when exceeding 10 repetitions).

**7: Bird Dog-** Objective: Core. Description: Subjects were asked to perform from hands and knees crawling position. Subjects were asked to keep back straight, abs engaged (tight), and head aligned with back. They were asked to extend one arm forward and the opposing leg backwards, until both are parallel with ground. They were asked to keep the foot neutral and knee pointing to the floor, and ensure both extended arm and leg form a straight line. Number of sets: 2-3. Number of repetitions: 10 on each side

**8: Burpee-** Objective: Conditioning/Speed. Description: They were asked to keep back straight, abs tight (engaged), hips aligned with shoulders, and head aligned with shoulders/back.

Sequence:-They were asked to start from a standing position; go to a crouching position; then to a push-up position; then to a crouching position again; followed by a vertical jump before returning to the starting position. Number of sets: 2-3 Number of repetitions: 10 Note: -1)The training schedule carried out after a warming up session of 15 minutes.2)The rest period between each repetition was one and half minutes to two minutes.

Cool-down and stretching - All exercise sessions were conclude with a cool-down phase. Cooling-down is best accomplished by slowly reducing the intensity of the exercise during the last several minutes of the workout. Stretching Routine 5-6 minutes-Stretching each body part 1-2 times; Holding each stretch 20-30 seconds; Stretching slowly and in control; They were asked not bounce or jerk; They were asked go to the point of tension but not pain; Breathe normally; and Avoid stretches that are uncomfortable or that hurt. For each exercise they were asked to feel a light stretch and maintain it 20-30 seconds; the tension was eased out gradually.

#### **Administration of tests:**

Before administration of tests a meeting of all the subjects and testers was held at the play field of Senior Secondary Schools of Kulgam District of Jammu and Kashmir. The requirements of testing procedure were explained to them in detailed so that there was no doubt left in their mind, regarding the effort and strain, they have to endure in addition to their school activities. No motivational technique was used in this study.

#### **50 Yards Dash**

Purpose: The purpose of the test were to measure the speed of the subjects. Equipment and Supplies: Stopwatches, measuring tape, marking powder, score sheet. Procedure: Two lines were marked on the ground 50 yards apart. One line were used as starting line and the other as the finish line. On the signal Ready, Go! The subject started running at their best reach the finish line at their earliest. The signal "Go" were accompanied with the downward sweep of the starter's arm to give the visual signal to the timer who will stand at the finish line. Scoring: Three trials were allowed to each subject with same rest in between the trials. The

time interval between the starting signal and the instant subject crosses the finish line were recorded as the score of the test. The time were recorded correctly to 1/100<sup>th</sup> of the second. The best of three trials were considered as the final score.

#### Nelson Hand Reaction Time Test

**Purpose:** To measure the hand reaction time of the subject. **Equipment:** Nelson reaction time scale, Table and Chair. **Description ;** After giving a practical demonstration to the subject, the tester will ask a subject to sit on the chair with his forearm and hand resting on the table in such a way that the tips of thumb and index finger were held in a ready to pinch position about 3 to 4 inches beyond the edge of the table. **Procedure:** The tester will assure that the upper edge of the thumb and index finger were in a horizontal position. Then the tester will hold the stick of the times from its top edge in such a way that the lower edge of the stick timer hanged between the subject thumb and index finger. So that the marked base line of the stick timer were in a same horizontal position in which were upper surface of the subjects thumb and forefinger. The subject were instructed to catch the stick by pinching together his thumb and index finger as soon as the stick timer were released by the timer. The subject were also instructed strictly neither to look at the tester's hand nor to move his hand up or down while attempting to catch the falling stick. Before leaving the stick, the tester gives a preparatory command of "Ready". Each subject were give twenty trials. **Scoring:** Time were read from the stick just upper part of the thumb when the subject catches the falling stick timer. Out of 20 trials, result of five faster and five slowest trials are discarded and the average of the middle 10 trails gives score of the test. To get the Reaction time the following formula were computed independently

$$\text{Reaction time (Sec.)} = \sqrt{\frac{2 \times \text{Distance the stick times fall (in Feet)}}{37 \text{ (Acceleration due to gravity)}}}$$

#### Shuttle Run

**Purpose:** The purpose of the test were to measure the agility of the cricket players. **Equipment and Supplies:** Two blocks of wood (2" x 2" x 4"), a stopwatch, marking powder, clapper and measuring tape. **Procedure:** Two parallel lines were marked on the ground 10 yards apart. The two wooden blocks were placed behind one of the lines. The subject were asked to start from behind the other line. On the signal ready, 'go' the timekeeper will start the watch and the subject were asked run towards the blocks, will pick-up one block, will run back to the starting line, will place the block behind the starting line, then again will run back and will pick-up the second block and then will carried it back across the starting line. As soon as the subject will cross the starting line with second block, the timekeeper will stop the watch and will record the time. **Score:** Three trials were allowed to each subject with same rest in between. The best time of the three trials were recorded to the nearest 1/100<sup>th</sup> of a second as the score of the test item.

### Modified Bass Dynamic Balance Test

**Purpose:** The purpose of the test was to measure the subject's ability to jump accurately and to maintain balance during repeated jumping. **Equipment and Supplies:** Stopwatches, measuring tape,  $\frac{3}{4} \times 1$  inch colored marking tape and score sheet. **Procedure:** Eleven Colored marking tape measuring  $\frac{3}{4} \times 1$ " was pasted on the floor as shown in Figure-1 at level S and 1-10. These marking tapes were obtained by proper measurement of distance 30" and 15" distance. After marking the required floor pattern, demonstration of the test was given to the subjects. Then the subject was asked to stand with the right foot on the starting tape mark and then to leap to the first tape mark with the left' foot. The subject was asked to maintain a steady balance on the ball of the left foot for as long as possible up to a maximum of five seconds after which he leaped to the second tape mark with right foot, and was asked to repeat the process completed at the first mark and to proceed to the next tape spots serially with alternate foot up to the 10<sup>th</sup> tape mark. The subject was told clearly that he will get one point for each second of balance maintained at the spot up to a maximum of five seconds and that his foot must cover the tape marked at each spot completely so that the tape cannot be seen by the tester when the subject is maintaining the balance of the body on a particular tape mark. The subject was penalized for hopping or moving the supporting ball of the foot. **Scoring:** The maximum points which can be scored at each landing spot are ten and thus can make a theoretically maximal score of the test as  $10 \times 10 = 100$ . At each landing point, five points was given to proper landing and five points was given for each second of steady balance on the ball of the concerned foot. If the subject lands improperly and not covered the tape marked at the spot or failed to stop on the landing spot or touched his heel or any other part of the body to the floor, he was awarded zero point out of the five points of landing. However on wrong landing, the subject was allowed to reposition by hopping for the 5-seconds balance points and then continued the test. In case, the subject committed balancing error either by touching any part of the body other than ball of the foot to the floor or by moving the foot, the subject was asked to step back on the spot just previous to balancing error and then was asked to leap afresh for the next spot and so on.

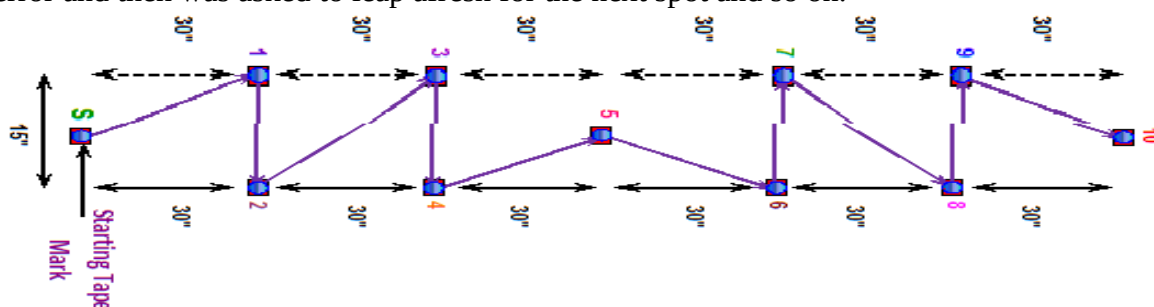


Figure 1:- Floor Area Marking of Modified Bass Dynamic Balance Test.

### Vertical Jump

**Purpose:** To measure the subjects power of the legs in jumping vertically upward. **Equipment and Facilities:** Vertical jump area, Measuring tape, Chalk, Weighing machine and Rag cloths. **Description:** Before making an effort to jump, the subjects weight were recorded in Kg. Than the subject were asked to stand near the wall facing sideward and the preferred

arm grasping top of shorts at the back and the other arm were kept raised vertically with the hand turned outward and fingers extended. Then the subject were asked to raise his hand lifting his hill to maximum as far as possible on the toes so that the height of the extended middle finger of the raised arm can be recorded. Chalk dust were placed on the middle finger, and the subject were asked to adopt full squat position with head and back erect and the body in balance. The subject were then asked to jump as high as possible using only one leg and touch the wall at the top of the jump. The jump were discarded in case the subject losses balance or position and another chance were given. Three trials were given to each subject. Scoring: Using the measure of the best jump i.e., the difference between the reaching height and jumping height, Calculation were made using the following formula.

#### Dodging Run Test

**Purpose:** The purpose of the test were to measure the running agility ability of the subjects. **Equipment's and Supplies:** Stop watch, four chair / plastic cones, measuring tape, score sheet etc. **Description:** Four chairs were arranged in a straight line, 10 feet apart. The starting point were 6 feet on the left side of the first chair / plastic cone and the finish line were on the right side of the chair / plastic cone again at a distance of 6 feet from the first chair / plastic cone. All the directions and the starting lines were marked on the ground. Before start of the test a demonstration were given to the subjects. Then the subject were asked to take the prone Starting position with hands on the starting line and on the command Ready, Steady, Go the subject will jump on one foot mark and will sprint for 30 feet, stops and will reverse sprint to go around the first chair / Plastic cone, will take the left turn around the first chair / plastic cone and will complete the zig-zag run as shown in Figure – 2. On returning to chair / plastic cone NO. 1, the subject will again take a left turn, but this time he will take a diagonal sprint to point B to the finish line which were one foot across the small line indicating 30 feet on the right side of the chair / plastic cone 1at a distance of 6 feet. As soon as the subject will, reach the finish area, the time keeper will stop the stopwatch. The subject will asked to run as fast as possible to cross the finish line. **Scoring:** Three trials were allowed to each subject with same rest in between. The best time of the three trials were recorded to the nearest 1/100<sup>th</sup> of a second as the final score of the test.

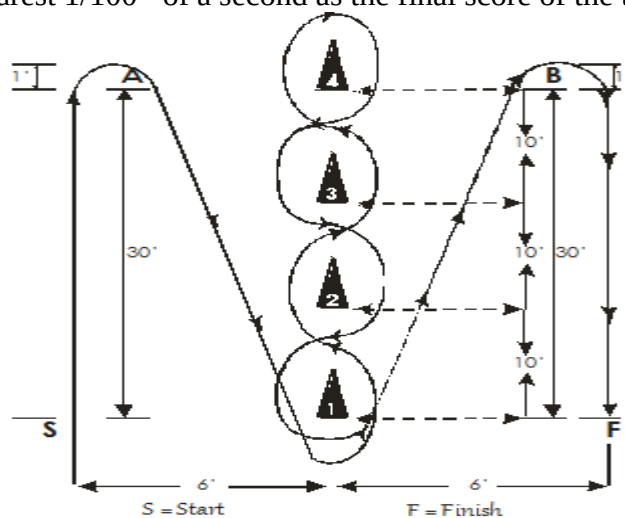


**Figure 2:-** Floor Area Marking of Dodging Run Test.

**Reliability Coefficient of Test-**

The tester's reliability was evaluated together with reliability of tests. To determine the reliability of the tests the performance of ten subjects selected at random on selected parameters were recorded by the Investigator and Dr. Tapan Dutta under identical condition was tested. A Pearson's product movement correlation was computed between the two measures of each variable and their reliability co-efficient have been shown in Table – 2.

**TABLE 2**  
**RELIABILITY COEFFICIENT OF TEST-RETEST SCORES**

| Tests         | Co-efficient of Correlation 'r' |
|---------------|---------------------------------|
| Speed         | .8766*                          |
| Reaction Time | .9842*                          |
| Agility       | .8987*                          |
| Balance       | .9765*                          |
| Power         | .9266*                          |
| Coordination  | .9662*                          |

\* Significant at 0.05 level of confidence., N = 10;  $r = 0.05 = 0.576$

From the test-retest co-efficient of correlation (Table – 2), it was obvious that the testers reliability was significantly high at 0.05 level of confidence establishing the reliability of the testers to administer the test. The co-efficient of co-relation also indicate the reliability of the tests selected, as very high correlations were obtained when the tests were repeated.

**Statistical Technique:**

To find out the significant effect of eight weeks of fitness program on skill related physical fitness of school children t -test was employed to compare mean difference between the pre-test and post-test scores. The obtained t-ratio was tested for significance at 0.05 level. All the data were analyzed by the use of (SPSS) Statistical Package for Social Sciences 16.0.

**RESULT OF THE STUDY**

To find out the significant difference between the pre-test and post-test means for the experimental group and control group were submitted to 't'-test have been presented in table 3 to 8.

**TABLE –3**  
**COMPARISON BETWEEN PRE AND POST TEST OF EXPERIMENTAL**  
**AND CONTROLGROUP ON THE BASIS OF 'T' RATIO**  
**FOR 50 YARD DASH (IN SECONDS)**

| Pre-test Mean | Pot-test Mean | Mean Difference | Standard Deviation | Standard Error | 't'-ratio | Sig. |
|---------------|---------------|-----------------|--------------------|----------------|-----------|------|
| 9.24          | 8.93          | .314            | .280               | .063           | 5.01      | .000 |

An analysis of Table-3reveals that there is significant difference in mean performance of 50 yard dash between pre-test and post-test of Experimental Group as a result of eight weeks of fitness program as the obtained t- ratio value of 5.01is not only found to be

significant at 0.05 level, but also found to be significant at .000 level of significance. The table also shows that there is a significant improvement in the post-performance of the experimental group. The mean difference of pre-test and post-test scores in seconds of experimental group for 50 yard dash has been depicted in Figure 3.

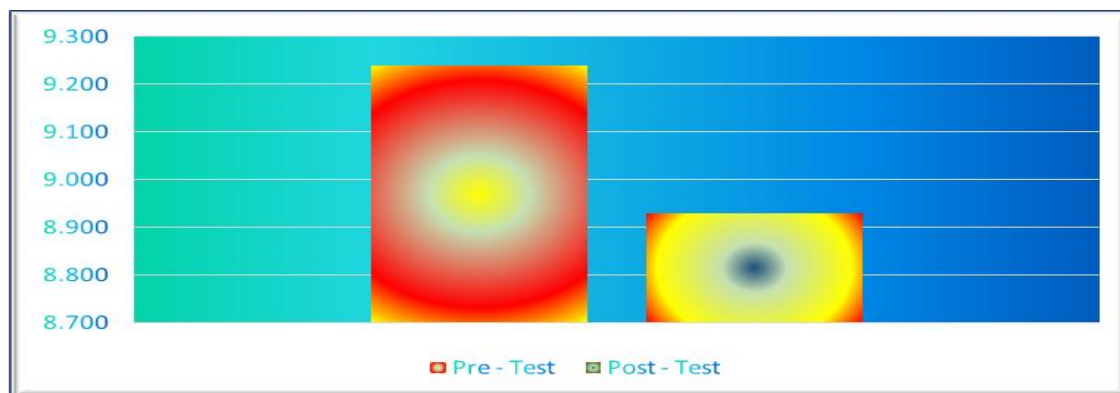


**Figure – 3:** Graphical Depiction of the Mean Difference of Mean Difference of Pre-Test and Post-Test Scores of Experimental Group for 50 Yard Dash (Seconds)

**TABLE 4**  
**COMPARISON BETWEEN PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON THE BASIS OF 'T' RATIO FOR NELSON'S HAND REACTION TIME (IN SECONDS)**

| Pre-test Mean | Pot-test Mean | Mean Difference | Standard Deviation | Standard Error | 't'-ratio | Sig. |
|---------------|---------------|-----------------|--------------------|----------------|-----------|------|
| .183          | .189          | .006            | .021               | .005           | 1.347     | .194 |

**\*Significant at 0.05 level**

An analysis of Table - 4 reveals that there is no significant difference in mean performance of Nelson Hand Reaction Time between pre-test and post-test of Experimental Group as a result of eight weeks of fitness programme as the obtained t- ratio value of 1.347 is not found to be significant at 0.05 level.

**TABLE 5**  
**COMPARISON BETWEEN PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON THE BASIS OF 'T' RATIO FOR SHUTTLE RUN (IN SECONDS)**

| Pre-test Mean | Pot-test Mean | Mean Difference | Standard Deviation | Standard Error | 't'-ratio | Sig. |
|---------------|---------------|-----------------|--------------------|----------------|-----------|------|
| 10.61         | 10.17         | .436            | .363               | .081           | 5.369     | .000 |

An analysis of Table - 3 reveals that there is significant difference in mean performance of Shuttle run between pre-test and post-test of Experimental Group as a result of eight weeks of fitness program as the obtained t- ratio value of 5.369 is not only found to

be significant at 0.05 level, but also found to be significant at .000 level of significance. The table also shows that there is a significant improvement in the post-performance of the experimental group. The mean difference of pre-test and post-test scores of experimental group for Shuttle run has been depicted in Figure – 4.

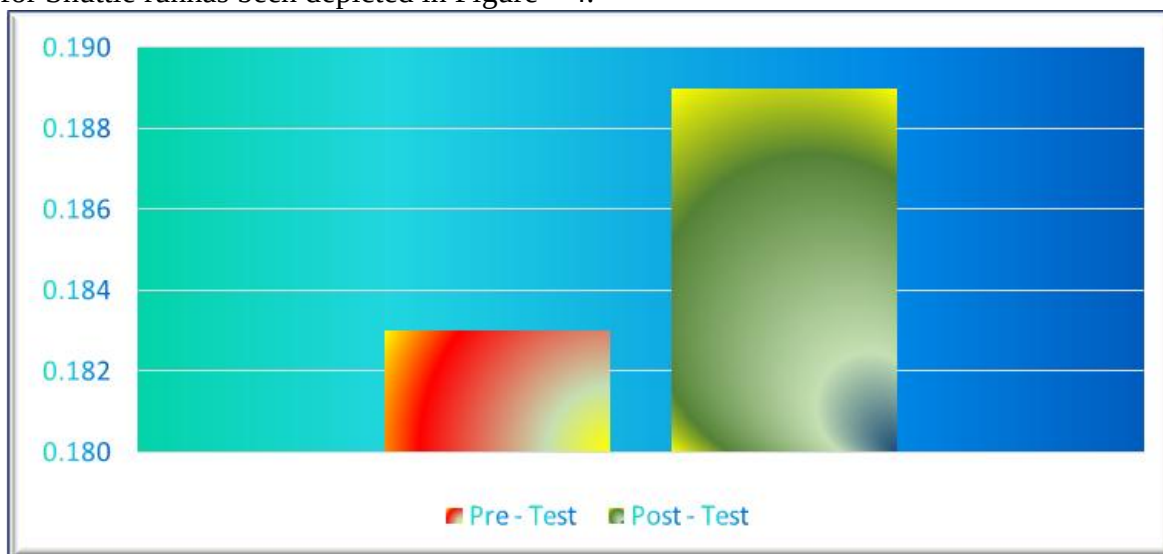


**Figure – 4:** Graphical Depiction of the Mean Difference of Pre-Test and Post-Test Scores of Experimental Group for Shuttle Run

**TABLE 6**

**COMPARISON BETWEEN PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON THE BASIS OF 'T' RATIO FOR MODIFIED BASS DYNAMIC BALANCE (IN POINTS)**

| Pre-test Mean | Post-test Mean | Mean Difference | Standard Deviation | Standard Error | 't'-ratio | Sig. |
|---------------|----------------|-----------------|--------------------|----------------|-----------|------|
| 50            | 50             | 10              | 16.384             | 3.663          | 2.730     | .013 |

An analysis of Table - 6 reveals that there is significant difference in mean performance of Modified Bass Dynamic Balance between pre-test and post-test of Experimental Group as a result of eight weeks of fitness programme as the obtained t- ratio value of 2.730 is not only found to be significant at 0.05 level, but also found to be significant at .013 level of significance. The table also shows that there is a significant improvement in the post-performance of the experimental group.

The mean difference of pre-test and post-test scores of experimental group for Modified Bass Dynamic Balance has been depicted in Figure – 5.

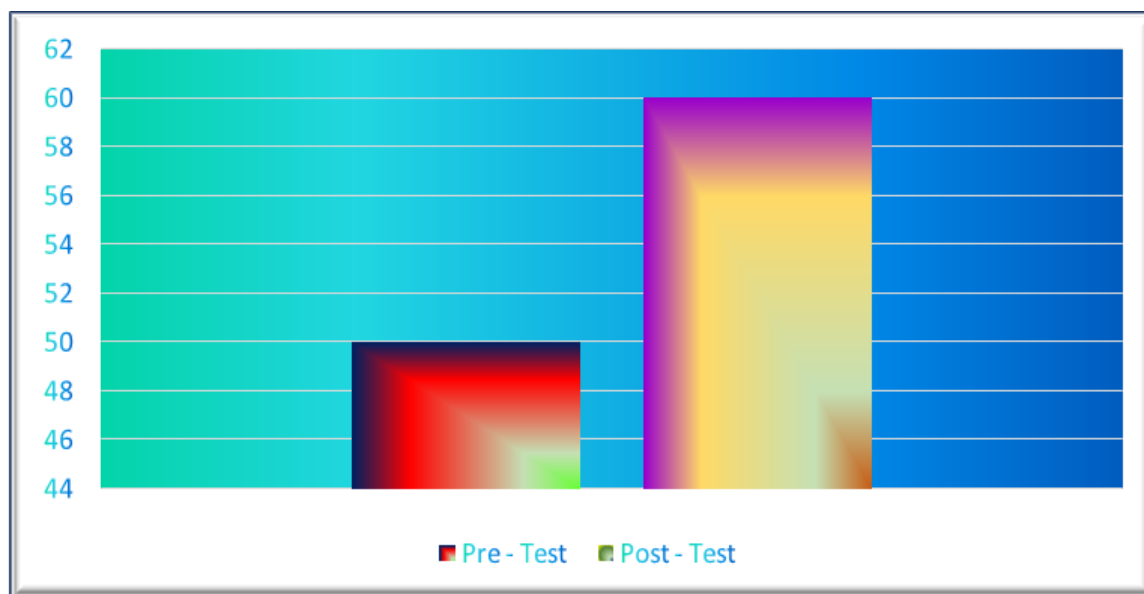


**Figure – 5:** Graphical Depiction of the Mean Difference of Mean Difference of Pre-Test and Post-Test Scores of Experimental Group for Modified Bass Dynamic Balance (Points).

**TABLE 7**  
**COMPARISON BETWEEN PRE AND POST TEST OF EXPERIMENTAL**  
**AND CONTROL GROUP ON THE BASIS OF ‘T’ RATIO**  
**FOR DODGING RUN (IN SECONDS)**

| Pre-test Mean | Pot-test Mean | Mean Difference | Standard Deviation | Standard Error | ‘t’-ratio | Sig. |
|---------------|---------------|-----------------|--------------------|----------------|-----------|------|
| 9.24          | 8.93          | .314            | .280               | .063           | 5.01      | .000 |

An analysis of Table - 7 reveals that there is significant difference in mean performance of Dodging Run between pre-test and post-test of Experimental Group as a result of eight weeks of fitness program as the obtained t- ratio value of 4.258 is not only found to be significant at 0.05 level, but also found to be significant at .000 level of significance. The table also shows that there is a significant improvement in the post-performance of the experimental group.

The mean difference of pre-test and post-test scores in Seconds of experimental group for Dodging Run has been depicted in Figure – 6.

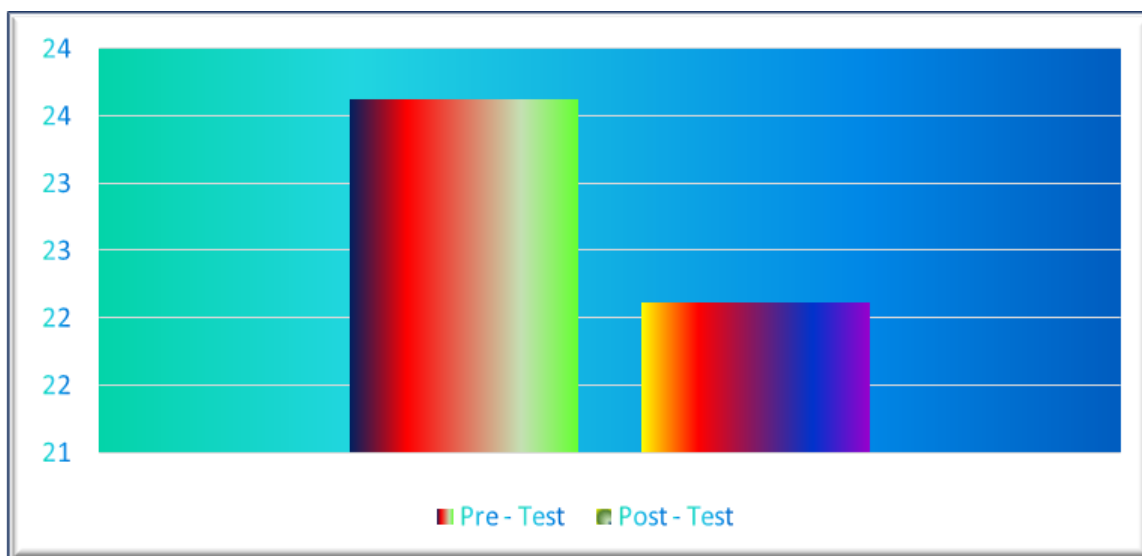


**Figure – 6:** Graphical Depiction of the Mean Difference of Mean Difference of Pre-Test and Post-Test Scores of Experimental Group for Dodging Run (Seconds).

**TABLE – 8**  
COMPARISON BETWEEN PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON THE BASIS OF ‘T’ RATIO FOR VERTICAL POWER JUMP (IN SCORES)

| Pre-test Mean | Pot-test Mean | Mean Difference | Standard Deviation | Standard Error | ‘t’-ratio | Sig. |
|---------------|---------------|-----------------|--------------------|----------------|-----------|------|
| 9.24          | 8.93          | .314            | .280               | .063           | 5.01      | .000 |

An analysis of Table - 8 reveals that there is significant difference in mean performance of Vertical Power Jump between pre-test and post-test of Experimental Group as a result of eight weeks of fitness program as the obtained t- ratio value of 17.616 is not only found to be significant at 0.05 level, but also found to be significant at .000 level of significance. The table also shows that there is a significant improvement in the post-performance of the experimental group.

The mean difference of pre-test and post-test scores of experimental group for Vertical Power Jumphas been depicted in Figure – 7.

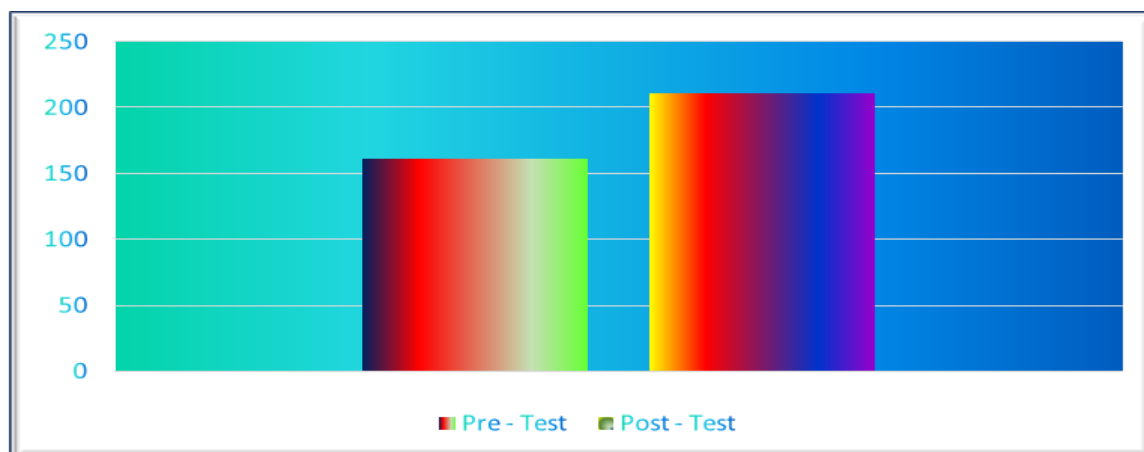


**Figure – 7:** Graphical Depiction of the Mean Difference of Mean Difference of Pre-Test and Post-Test Scores of Experimental Group for Vertical Power Jump (Seconds)

## DISCUSSION

The analysis of data clearly reveals that eight weeks of fitness program brought significant changes in the speed performance of the subjects when the pre-test and post-test means of school children were compared. It may be due to reason that due to repeated involvement in the fitness training program the subjects working capacity of ATP-CP system might have increased which would have resulted in the improvement of glycolytic system and more activation related system takes place which in turn would have improve an-aerobic adaptation. Whereby they have shown better performance as a result of eight weeks of training program. The findings of the study are in consonance with the findings of Bucy (1965),.

The findings of the present study reveals that the eight weeks of fitness program could not brought any significant change in the flexibility of the subjects when the pre-test and post-test means of school children were compared. Which clearly indicates that flexibility could not be improve by adopting the above selected training program.

The analysis of data clearly reveals that eight weeks of fitness program brought significant improvement in the performance of the agility of the subjects i.e., Shuttle run and Dodging run when the pre-test and post-test means of school children were compared. It may be due to the reason that Agility is nothing, but the ability of the individual for rapidly change position of entire body with speed and accuracy, which demands differentiation, orientation courting, reaction, balance, rhythm and adaptation ability. As the subjects where involved in specific interval training program and where in the category of beginners, they might have developed the above abilities, hence the above findings had been shown by the subjects. The findings of the study are in consonance with the findings of Sinha and Brar, 1985.

The findings of the study reveal that there is a significant improvement in dynamic balance i.e., Modified Bass Dynamic Balance test, when the pre-test and post-test means of

school children were compared. It may be due to the reason that dynamic balance is based on kinesthetic sense, physiological mechanism and neuromuscular co-ordination which gets consolidated along with strength. It may be also be due to the reason that 12 weeks training might have brought significant change in the functions of the kinesthetic sensations in the muscles, tendons and joints; visual perception while body is in motion; and the ability of subjects to coordinate these three sources of stimuli which helps in maintaining the stability whether it is static or dynamic. Therefore, change can only be expected as a result of systematic and scientific training process. As the subjects have gone through systematic training program they have shown significant improvement. The findings are in consonance with the findings of Twist, Gleeson and Eston (2008).

The findings of the study reveal that there is a significant improvement in Vertical Power Jump, when the pre-test and post-test means of school children were compared. It may be due to the reason that fitness training program might have improved the muscle tone which might have attributed to two inherent properties of the muscle tissue. One the muscle possibly stretched prior to a contraction utilizes the stretch reflex to activate the muscle to shorten vigorously, and second the elastic nature of the muscle fibre allowed the muscle to store energy during negative work or the phase of amortization, to be later released during the overcoming phase or shortening contraction. Therefore, the increased performance in leg strength following 8 weeks of fitness training program might have attributed to the utilization of elastic energy and to the stretch reflex potential of muscles.

In the beginning of the study, it was hypothesized that there may be significant difference in the selected skill related physical fitness variables, following the eight weeks of fitness program on skill related physical fitness of school children. The result of the study showed the when the selected g skill related physical fitness variables were analysed on the basis of 't' ratio between the Pre-test and Post-test scores significant difference was found among the five selected variables i.e., Speed i.e., 50 yard Dash, Agility i.e., Shuttle run, Balance i.e., Modified Bass Dynamic Balance, Power i.e., Vertical Power Jump and Coordinative ability i.e., Dodging Run. Hence, the hypothesis in the above case were accepted. Whereas no significant difference was found in Reaction time i.e., Nelson Hand Reaction Time Test between the Pre-test and Post-test scores, hence the hypothesis is not accepted in the above cases.

## CONCLUSIONS

Within the delimitations and limitations of the present study and on the basis of findings, the following conclusions are been drawn –

- 1) The findings of the study reveal that there is a significant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Speed (50 Yard Dash) of school children were compared.
- 2) The findings of the study reveal that there is a significant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Agility (Shuttle Run) of school children were compared.
- 3) The findings of the study reveal that there is a significant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Balance (Modified Bass Dynamic Balance) of school children were compared.

- 4) The findings of the study reveal that there is a significant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Coordinative Ability (Dodging Run) of school children were compared.
- 5) The findings of the study also reveal that there is a significant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Power (Vertical Power Jump), of school children were compared.
- 6) Whereas the findings of the study reveal that there is no significant effect of fitness training program when the Pre and Post-Test scores of selected skill related physical fitness i.e. Reaction Time (Nelson Hand Reaction Time), of school children were compared.

### **BIBLIOGRAPHY**

- Bucy .** “Comparison of the Effect of Three Method of Training on Physical Fitness”, Completed Research in Health, Physical Education and Recreation, 7 (1965): 34.
- Clarke, Harrison H.** "The Physical Fitness Values" SNIPES Journal (January 1981),: 60.
- Johnson, Barry L. and Nelson, Jack K.** Practical Measurements for Evaluation in Physical Education 3<sup>rd</sup>ed. New Delhi: Surjeet Publications, 1988.
- Kansal, Devinder K** Test and Measurement in Physical Education and Sports, New Delhi: D.V.S. Publication. 1997.
- Kraemer, William J. ; Vogel, James A. ; Patton, John F. ; Dziados, Joseph E. ; Reynolds, Katy L.** “The Effects of Various Physical Training Programs on Short Duration, High Intensity Load Bearing Performance and the Army Physical Fitness Test” Technical Report , United States Army Research Institute of Environmental Natick, MA, August 1987.
- Singh, Thongam Shyam** “**Comparative Effect of Rope Skipping and Step-up exercises** on Cardio-respiratory Endurance of the Kabaddi Players”, Unpublished Master’s Thesis, Amravati University, Amravati, 1992.
- Sinha, S. K. and Brar, T. S.** “Comparative Effects of Different Conditioning Programme on Selected Physiological Variables”, Unpublished M. Phil. Thesis, Jiwaji University, Gwalior, 1985.
- Singh, Hardayal.** Science of Sports Training , New Delhi: D.V.S. Publication, 1991.
- Twist C , Gleeson N and Eston R** “The Effects of Plyometric Exercise on Unilateral Balance Performance”, Journal of Sports Sciences. 26 :10 ( August, 2008) ; :1073-1080.
- Uppal, A. K.** Physical Fitness – How To Develop, New Delhi: Friends Publications, 1992, India.
- Wilson, G. J.** “The Optimal Training Load for the Development of Dynamic Athletic Performance” Medicine and Science in Sports and Exercise, 25:11 (November, 1993): 1279-1286.
- Electronically Retrieved** on 20-1-2014, Cited at <http://www.sharecare.com/what-is-skill-related-fitness.htm>