CHAPTER II

REVIEW OF RELATED LITERATURE

A review of literature relating to the studies on the effect of Specific Soccer training on playing ability and psychological variables (Self-concept and Personality Traits factors) of high fit tribal and non-tribal Soccer players as the scholar could glean from the published reports available in the library of the Lakshmibai National Institute of Physical Education Gwalior, Burdwan University, Burdwan and Kalyani University, Kalyani are abstracted in this chapter to provide the background material for this study. The reviews of literature are divided into three sections. Studies pertaining to the playing ability are included in section I, section II covers the studies pertaining to Personality Trait Factors and the studies of the dimensions of Self Concept are included in section III.

SECTION I - PLAYING ABILITY

A few Studies of Soccer playing ability showing significant difference have been found reported in the professional literature.
Chamari et al.\textsuperscript{1} done a study to assess aerobic performance in Soccer by means of a Specific dribbling track: the Hoff test. They further determined whether improvement in maximal oxygen uptake was reflected in increased distance covered in the Hoff test. They tested 18 male Soccer players both in the laboratory and using the Hoff test before and after 8 weeks of Soccer training. The distance covered in the Hoff test correlated significantly with maximum oxygen uptake, and improved during the 8 week training period, while maximum oxygen uptake and running economy improved, respectively. Backward multiple regressions showed maximum oxygen uptake to be the main explanatory variable for the distance covered in the Hoff test. The present study demonstrated a significant correlation between laboratory testing of VO(2max) and performance in the Hoff test. Furthermore, training induced improvements in VO(2max) were reflected in improved performance in the Hoff test.

Erceg, Zagorac and Katic\textsuperscript{2} determined the effect of football school program and physical education curriculum on changes in the motor abilities of 7- and 8-year-old boys. The study included a sample of 180 boys divided into group 1 (7-year-old boys), subdivided to experimental (n


= 40) and control (n = 50) groups, and group 2 (8-year-old boys), subdivided to experimental (n = 40) and control (n = 50) groups. Experimental groups included children attending three training units of football training over a 9-month period, in addition to the conventional physical education curriculum. Control groups included children attending only conventional physical education curriculum. All study subjects underwent testing with a battery of 12 motor tests at the beginning and at the end of the study. Results obtained by discriminative canonic analysis showed no statistically significant between-group difference in motor abilities at the beginning of the study. However, significant differences in favor of experimental groups were recorded at the end of the study.

Helgerud et al.³ studied the effects of aerobic training on performance during Soccer match and Soccer Specific tests. Nineteen male elite junior Soccer players randomly assigned to the training Group-And the control group participated in the study. The Specific aerobic training consisted of interval training, four times 4 min at 90-95% of maximal heart rate, with a 3-min jog in between; twice per week for 8 wk. Players were monitored by video during two matches, one before and one after training.

In the training group: a) maximal oxygen uptake (VO2max) increased, b) lactate threshold improved, c) running economy was also improved, d) distance covered during a match increased in the training group; e) number of sprints increased, f) number of involvements with the ball increased, g) the average work intensity during a Soccer match, measured as percent of maximal heart rate, was enhanced and h) no changes were found in maximal vertical jumping height, strength, speed, kicking velocity, kicking precision, or quality of passes after the training period. The control group showed no changes in any of the tested parameters.

Sporis, Ruzic and Leko\(^4\) determined whether an experimental conditioning program would elicit better effects than the widely used traditional program, especially across longer distances. Laboratory measurements of maximal oxygen consumption and maximal heart rate were performed on 48 soccer players (U19) from two first league soccer teams. Exercise intensities were calculated from heart rate maximum. Detailed training programs for both the experimental and control groups were designed for the 13-week period. The main intervention was performed in the conditioning phase where the control group performed

traditional conditioning (straight-line running, with stretching exercises in the break) and the experimental group underwent a conditioning training program on designed polygon, very much akin to a real game situation; sprint-runs with or without the ball and rapid changes in direction. During the 20, 40 or 60m sprint-run the players had to perform specific ball drills depending on marked polygon station. Running performance at 60, 100, 200, 400, 800, 1200, 2 400 m distances and V.O(2max) were tested in the initial, transitory (week 6) and final trials. Significant improvement in 200, 400, 800, 1200, 2 400 m running performance and V.O(2max) (P<0.01), occurred in the experimental group after only 6 weeks of program and increased more after 13 weeks.

Impellizzeri et al.\textsuperscript{5} compared the effects of Specific (small-sided games) vs. generic (running) aerobic interval training on physical fitness and objective measures of match performance in Soccer. Forty junior players were randomly assigned to either generic or Specific interval training consisting of 4 bouts of 4 min at 90-95 % of maximum heart rate with 3 min active rest periods, completed twice a week. The following outcomes were measured at baseline (Pre), after 4 weeks of pre-season

training (Mid), and after a further 8 weeks of training during the regular season (Post): maximum oxygen uptake, lactate threshold, running economy at lactate threshold, a Soccer-Specific endurance test (Ekblom's circuit), and indices of physical performance during Soccer matches (total distance and time spent standing, walking, and at low- and high-intensity running speed). Training load, as quantified by heart rate and rating of perceived exertion, was recorded during all training sessions and was similar between groups. There were significant improvements in aerobic fitness and match performance in both groups of Soccer players, especially in response to the first 4 weeks of pre-season training. However, no significant differences between Specific and generic aerobic interval training were found in any of the measured variables including Soccer Specific tests.

McMillan et al. studied the physiological adaptations to a 10 week high intensity aerobic interval training program performed by professional youth Soccer players, using a Soccer Specific ball dribbling track. Eleven youth Soccer players performed high intensity aerobic interval training sessions twice per week for 10 weeks in addition to normal Soccer training.

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The Specific aerobic training consisted of four sets of 4 min work periods dribbling a Soccer ball around a specially designed track at 90-95% of maximal heart frequency, with a 3 min recovery jog at 70% of maximal heart frequency between intervals. Mean VO2max improved significantly, Squat jump and counter movement jump height increased significantly. No significant changes in body mass, running economy, rate of force development, or 10 m sprint times occurred.

Dupont, Akakpo and Berthoin\textsuperscript{7} studied the effects of in-season, high-intensity interval training on professional male Soccer players' running performances. Twenty-two subjects participated in 2 consecutive training periods of 10 weeks. The first period was considered a control period and was compared with a period where 2 high-intensity interval training exercises were included in the usual training program. Intermittent runs consisted of 12-15 runs lasting 15 seconds at 120% of maximal aerobic speed alternated with 15 seconds of rest. Sprint repetitions consisted of 12-15 all-out 40-m runs alternated with 30 seconds of rest. Results from the high-intensity interval training have shown that maximal aerobic speed was improved and that the time of the 40-m sprint was decreased, whereas no change in either parameter was observed during the control period.

Sharma\textsuperscript{8} conducted a study on effect of interval training on endurance and playing ability of soccer players. He selected 60 students as subjects randomly of Kendriya Vidyalaya, Gwalior who were studying in the tenth, eleventh and twelfth standards. Pre and Post test was conducted on 12 minutes run and walk test for endurance and McDonald soccer test for performance measure. He conducted interval training (without ball) and interval training (with ball) for experiment group. The result of this study reveals that interval training group performed with ball proved to be a better method in order to improve the endurance and playing ability of the soccer players.

Christou et al.\textsuperscript{9} examined the effects of a progressive resistance training program in addition to Soccer training on the physical capacities of male adolescents. Eighteen Soccer players were separated in Soccer and a strength-Soccer training Group-And 8 subjects of similar age constituted a control group. All players followed a Soccer training program 5 times a week for the development of technical and tactical skills. In addition, the strength-Soccer training group followed a strength training program twice a week for 16 weeks. The program included 10 exercises, and at each


exercise, 2-3 sets of 8-15 repetitions with a load 55-80% of 1 repetition maximum (IRM). Maximum strength ([IRM] leg press, bench-press), jumping ability (squat jump [SJ], countermovement jump [CMJ], repeated jumps for 30 seconds) running speed (30 m, 10 x 5-m shuttle run), flexibility (seat and reach), and Soccer technique were measured at the beginning, after 8 weeks, and at the end of the training period. After 16 weeks of training, 1RM leg press, 10 x 5-m shuttle run speed, and performance in Soccer technique were higher for the strength-Soccer training Group-And the Soccer groups than for the control group. One repetition maximum bench press and leg press, squat jump and countermovement jump height, and 30-m speed were higher for the strength-Soccer training group-Compared with Soccer and control groups.

Venturelli, Bishop and Pettene\textsuperscript{10} investigate whether coordination or repeated-sprint training better improved speed over 20 m, with and without the ball. Sixteen soccer players were randomly assigned to a sprint-training group or a coordination-training group. The sprint-training group trained twice a week for 12 wk and performed 20 repetitions of 20- and 10-m sprints; the coordination-training group performed coordination training (eg, speed ladder running) for the same training duration. Maximal jump

height, anthropometric measures, and 20-m sprint time, with and without ball, were evaluated before and after the training period. Both groups improved speed without the ball: There were significant correlations between sprint time without ball, countermovement jump, and squat jump. Co-ordination training increases the speed with the ball more than typical repeated-sprint training.

Tomar\textsuperscript{11} studied the effect of warm up with and without soccer ball with different intensities and different duration on performance in McDonald soccer test of 13 to 16 years of age group soccer player of Motilal Nehru school of sports, Rai, Hariyana and found that warm up of medium intensity with soccer ball produced the best performance in McDonald soccer test. Significant differences were obtained between warm up of different durations of minutes i.e. 20 minutes and 10 minutes, 25 minutes and 10 minutes, 25 minutes and 15 minutes and 25 minutes and 20 minutes. Mean differences of scores obtained on the McDonald soccer test as a result of warm up with and without soccer ball between low and medium intensities were not found significant.

\textsuperscript{11} Bajrang Dev Singh Tomar, “Effect of Warm up with and without ball with Different Intensities and Different Duration on Performance in McDonald Soccer Test”, (Unpublished Master’s Thesis, Jiwaji University, 1984).
Kotzamanidis et al.\textsuperscript{12} investigated the effect of a combined heavy-resistance and running-speed training program performed in the same training session on strength, running velocity and vertical-jump performance of Soccer players. Thirty-five individuals were divided into 3 groups. The first group performed a combined resistance and speed training program at the same training session, and the second one performed the same resistance training without speed training. The third group was the control group. Three jump tests were used for the evaluation of vertical jump performance: squat jump, countermovement jump, and drop jump. The 30-m dash and 1 repetition maximum tests were used for running speed and strength evaluation, respectively. After training, both experimental groups significantly improved their 1 repetition maximum of all tested exercises. Furthermore, the first group performed significantly better than the second Group-And the control groups in the 30-m dash, squat jump, and countermovement jump.

Hoff et al.\textsuperscript{13} determined whether ball dribbling and small group play are appropriate activities for interval training, and whether heart rate in Soccer Specific training is a valid measure of actual work intensity. Six


well trained first division Soccer players took part in the study. To test whether Soccer Specific training was effective in interval training, players ran in a specially designed dribbling track, as well as participating in small group play (five a side). Laboratory tests were carried out to establish the relation between heart rate and oxygen uptake while running on a treadmill. Corresponding measurements were made on the Soccer field using a portable system for measuring oxygen uptake. Exercise intensity during small group play was 91.3% of maximal heart rate or 84.5% of maximal oxygen uptake. Corresponding values using a dribbling track were 93.5% and 91.7%. No higher heart rate was observed during Soccer training. It was observe that Soccer Specific exercise using ball dribbling or small group play may be performed as aerobic interval training. Heart rate monitoring during Soccer Specific exercise is a valid indicator of actual exercise intensity.

Diallo et al.\textsuperscript{14} The purpose of this study was to examine the effectiveness of plyometric training and maintenance training on physical performances in prepubescent Soccer players. Twenty boys was divided in two groups jump Group-And control group. Jump group trained 3

days/week during 10 weeks, and performed various plyometric exercises including jumping, hurdling and skipping. The subsequent reduced training period lasted 8 weeks. However, all subjects continued their Soccer training. Maximal cycling power was calculated using a force-velocity cycling test. Jumping power was assessed by using the following tests: countermovement jump, squat jump, drop jump, multiple 5 bounds and repeated rebound jump for 15 seconds. Running velocities included: 20, 30 and 40 m. Body fat percentage and lean leg volume were estimated by anthropometry. After the training programme, Maximal cycling power, countermovement jump, squat jump, multiple 5 bounds, repeated rebound jump for 15 seconds and Running velocities 20 m, performances increased in the jump group.

Polman et al. \(^{15}\) examined the efficacy of three physical conditioning programmes provided over a 12 week on selected anthropometric and physical fitness parameters in female Soccer players. Two of the groups received physical conditioning training in accordance with speed, agility and quickness, one group used specialized resistance and speed development equipment, while the other group used traditional Soccer coaching equipment. A third group received their regular fitness sessions.

All three interventions decreased the participants' body mass index and fat percentage, and increased their flexibility and maximal aerobic capacity (VO2max). The participants in the equipment and non-equipment conditioning groups showed significantly greater benefits from their training programme than those in the active control Group-By performing significantly better on the sprint to fatigue, 25 m sprint, left and right side agility, vertical and horizontal power tests.

Impellizzeri et al. 16 examined the effects of plyometric training on sand versus a grass surface on muscle soreness, vertical jump height and sprinting ability. Parallel two-group, randomised, longitudinal (pretest-post-test) study. After random allocation, 18 Soccer players completed 4 weeks of plyometric training on grass and 19 players on sand. Before and after plyometric training, 10 m and 20 m sprint time, squat jump, countermovement jump, and eccentric utilization ratio (squat jump/ countermovement jump) were determined. Muscle soreness was measured using a Likert scale. The grass group improved their countermovement jump and eccentric utilization ratio (squat jump/ countermovement jump)

significantly more than players in the sand group. In contrast, players in the sand group experienced less muscle soreness than those in the grass group.

Avloniti et al. 17 investigated the acute changes in leukocyte number and cortisol after a single bout of Soccer training. Ten elite female national-team Soccer players and 8 nonathletes participated in the study. The duration of the exercise was 2 h, and it was performed at an intensity of 75% of maximal heart rate. Blood samples were taken before, immediately after, and 4 h after a Soccer training session to determine total white blood cells; the subsets of neutrophils, lymphocytes, monocytes, eosinophils, and basophils; and cortisol. At the same time, blood samples were obtained from non-athletes who refrained from exercise. Data analysis indicated a significant increase in total white blood cells in the athletes post-exercise. The leukocytosis was still evident after 4 h of recovery (78% higher than the pre-exercise values), and there was a significant difference between athletes and non-athletes. In addition, there was a statistically significant difference in cortisol concentration between athletes and non-athletes after the exercise.

Sidhu and Grewal \textsuperscript{18} conducted a study to assess the effect of hard physical training. Female hockey players (N=15) were selected as the subjects for the study. The subjects were tested initially in weight, heart-rate resting and heart-rate during exercise and recovery, and were tested again after 25 days of training. It was found that with training, the resting heart rate, maximum heart-rate after exhaustive exercise and recovery, heart rate showed considered improvement. However, no major change occurred in body weight.

Ibanez et al.\textsuperscript{19} (2006) studied effects of an entire season on physical fitness changes in elite male handball players. To examine the effects of an entire season of play on physical fitness and throwing velocity. The handball season resulted in significant increases in maximal and Specific strength of the upper-extremity actions and the correlations observed suggest that training time at low intensity should be given less attention, in the full training season program.


\textsuperscript{19} Ibanez, Javier, Izquierdo, Mikel, Gorostiaga, M. Esteban, Granados, Cristina, Badillo Gonzalez and J. Juan, "Effects of an entire season on physical fitness changes in elite male handball players", \textit{Journal of Sports and fitness}, ISSN: 0195-9131.
Martel et al. \(^{20}\) examine the effects of aquatic plyometric training on Vertical jump and muscular strength in volleyball players. Nineteen female volleyball players were randomly assigned to perform 6 wk of aquatic plyometric training or flexibility exercises (Control Group) twice weekly, both in addition to traditional preseason volleyball training. Testing of leg strength was performed at baseline and after 6 wk, and VJ was measured at baseline and after 2, 4, and 6 wk. Similar increases in Vertical jump were observed in both groups after 4 wk, however, the aquatic plyometric training group improved more from week 4 to week 6, whereas there was no further improvement in the control group.

Newton, kraemer and Hakkinen \(^{21}\) had done a study to determine whether ballistic resistance training would increase the vertical jump performance of already highly trained jump athletes. Sixteen male volleyball players from a NCAA Division I team participated in the study. A Vertec was used to measure standing vertical jump and reach and jump and reach from a three-step approach. Several types of vertical jump tests were also performed on a Plyometric Power System and a force plate to


measure force, velocity, and power production during vertical jumping. The subjects completed the tests and were then randomly divided into two groups, control and treatment. All subjects completed the usual preseason volleyball on-court training combined with a resistance training program. Both groups were retested at the completion of the training period. The treatment group produced a significant increase in both standing vertical jump and reach and jump and reach from a three-step approach.

Santos and Janeira\textsuperscript{22} determined the effects of (a) plyometric training on explosive strength indicators in adolescent male basketball players and (b) detraining and reduced training on previously achieved explosive strength gains. Two groups were formed: an experimental and a control group. The former was submitted to a 10-week in-season plyometric training program, twice weekly, along with regular basketball practice. Simultaneously, the control group participated in regular basketball practice only. At the end of this period, the experimental group was subdivided into 2 groups: a reduced training Group-And a detraining group. All participants were assessed on squat jump, countermovement jump, Abalakov test, depth jump, mechanical power, and medicine ball

throw at the beginning and at the end of the 10-week in-season plyometric training and on weeks 4, 8, 12, and 16 of the in-season detraining and reduced training periods. In the first phase of the study, the experimental group significantly increased all the assessed indicators. In the following phase and in general all the groups maintained the previously achieved results. Plyometric training showed positive effects on upper- and lower-body explosive strength in adolescent male basketball players.

Santos and Janeira evaluated the effects of a complex training program, a combined practice of weight training and plyometrics, on explosive strength development of young basketball players. Twenty-five young male athletes, aged 14-15 years old, were assessed using squat jump, countermovement jump, Abalakov test, depth jump, mechanical power, and medicine ball throw, before and after a 10-week in-season training program. Both the control group and the experimental group kept up their regular sports practice; additionally, the experimental group performed 2 sessions per week of a complex training program. The experimental group significantly improved in the squat jump, countermovement jump, Abalakov test, and medicine ball throw values. The control group

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significantly decreased the values of countermovement jump, Abalakov test, and mechanical power, while significantly increasing the medicine ball throw values.

Kshatriya 24 studied the effect of 8 weeks of training program on the cardio-respiratory endurance of Basketball players. In his training program included 1/2mile jogging, grass root drill, hill sprint, 50 yards sprint, stretching. These trainings were speed and endurance exercise. During the training program, he has 1st, 2nd and 3rd treatment, 4th, 5th and 6th week treatment and 7th, 8th week treatment. Through this training program, he found the development of heart rate, blood pressure and lungs capacity. There was significant improvement in the cardio-respiratory endurance.

Uppal et al. 25 selected junior badminton players (N=15) from different states of India for the purpose of the study. The subjects were trained with 6- days a week for four weeks training program included for the development of physical fitness. The results of the study shows that women badminton players having significant improvement in 8- minutes

run/walk, standing broad jump, bent-leg sit-ups, but in case of 50M dash and shuttle run, the improvement was not statistically significant.

Markovic et al.\textsuperscript{26} done a study to evaluate the effects of sprint training on muscle function and dynamic athletic performance and to compare them with the training effects induced by standard plyometric training. Male physical education students were assigned randomly to 1 of 3 groups: sprint group, plyometric group or control group. Maximal isometric squat strength, squat- and countermovement jump (SJ and CMJ) height and power, drop jump performance from 30-cm height, and 3 athletic performance tests (standing long jump, 20-m sprint, and 20-yard shuttle run) were measured prior to and after 10 weeks of training. Both experimental groups trained 3 days a week; sprint group performed maximal sprints over distances of 10-50 m, whereas plyometric group performed bounce-type hurdle jumps and drop jumps. Participants in the control group maintained their daily physical activities for the duration of the study. Both sprint Group-And plyometric group significantly improved drop jump performance, squat- Jump and countermovement jump height and standing long jump distance. In addition, sprint Group-Also improved

isometric squat strength and squat- Jump and countermovement jump power as well as sprint and agility performance.

Loy et al. 27 done a study on physically active college age women to determine the effects of 9 wk of stair-climbing (Stairmaster Gauntlet) vs. run training on 2414-m run time or treadmill measured aerobic capacity (VO2max) and sub maximal physiological parameters. Subjects were randomly assigned to a stair-climbing Group-And run training group, training 4 d.wk-1 at 70-80% of maximum heart rate for 30 min progressing to 85-90% maximum heart rate for 45 min. The stair group significantly increased their VO2max and decreased their 2414-m run time by 8%. The RUN group increased their VO2max and decreased run time of 11%. Sub maximal treadmill runs at the same speed and grade demonstrated significant decreases in %VO2max and % maximum heart rate for both groups.

Smith, McNaughton and Marshall 28 determined the effects of a 4-wk individualized training program using Vmax as the exercise intensity and utilizing between 60 and 75% of a subject's Tmax as the exercise

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duration. Five male, middle-distance, trained subjects volunteered to participate in this study. Before the training program, the subjects completed a 3000-m time trial, and three each of VO2max/Vmax and Tmax tests. Subjects then completed a 4-wk training program on the treadmill and were then retested on the VO2max/Vmax and Tmax tests. Pre training versus post training results showed significant increases in average Vmax, Tmax and VO2max.

Wilson \(^{29}\) did a study to determine which of three theoretically optimal resistance-training modalities in the greatest enhancement in the performance of a series of dynamic athletic activities. The three training modalities include: (1) traditional weight training, (2) Plyometric Training, (3) Explosive weight training, at the load that maximized mechanical power output. 64 previously trained subjects were randomly allocated to four groups that included the above 3 training modalities and a control group. The experimental groups trained for 10 weeks performing heavy squat lifts, depth jumps or weighted squat jumps. All subjects were tested prior to training, after 5 weeks of training and at the competition of the training period. The test items included (1) 30mts. Sprint, (2) Vertical

jumps performance with and without counter movement, (3) Maximal cycle test, (4) Iso-Kinetic leg extension test, and (5) Isometric test. The experiment group which trained with the load maximized mechanical power achieved the best overall results in enhancing dynamic athletic performance recording statistically significant improvements on most test items and showing statistically superior results from the two other training modalities on the jumping and the iso-kinetic test.

Spurrs, Murphy and Watsford examined whether changes in running performance resulting from plyometric training were related to alterations in lower leg musculotendinous stiffness. Seventeen male runners were pre- and post-tested for lower leg musculotendinous stiffness, maximum isometric force, rate of force development, 5-bound distance test, counter movement jump (CMJ) height, RE, VO(2max), lactate threshold, and 3-km time. Subjects were randomly split into an experimental group which completed 6 weeks of plyometric training in conjunction with their normal running training, and a control group which trained as normal. Following the training period, the Experimental group significantly improved 3-km performance and RE at each of the tested

velocities, while no changes in VO\(_{2}\text{max}\) or lactate threshold were recorded. CMJ height, 5-bound distance test, and musculotendinous stiffness also increased significantly.

Otsuki et al.\(^{31}\) studied to investigate whether post exercise HR recovery accelerates in strength-trained athletes. Subjects were young strength trained athletes, endurance trained athletes and age matched sedentary control men. HR and oxygen uptake were measured during sub maximal exercise (cycling exercise, 40% maximal oxygen uptake for 8 min) and 30sec. after the exercise (the post exercise period). The results suggest that the HR recovery immediately after exercise is accelerated in both strength and Endurance trained athletes.

Smith\(^{32}\) studied the effect of circuit training on the performances skill of beginners and advanced beginner swimmers. Subjects were 52 male and female students at North Carolina Central University. The variables measured for beginner swimmers were breath holding, prone glide, arm stroke and crawl stroke, and advanced beginner swimmers, treading water, front crawl, and back stroke. Students were randomly divided in to 2 equal


groups. The experimental group engaged in 6 weeks of swimming. It was found that circuit training had a significant effect on the performance skills of the experimental beginner swimmers.

Harrison and Bourke\textsuperscript{33} investigated whether a resistance sprint training intervention would enhance the running speed and dynamic strength measures in male rugby players. Fifteen male rugby players who were proficient in resisted sledge training took part in the study. The subjects were randomly assigned to control or resistance sprint groups. The resistance sprint group performed two sessions per week of RS training for 6 weeks, and the control group did no resistance sprint training. Pre- and post intervention tests were carried out for 30-m sprint, drop, squat, and rebound jumps on a force sledge system. A laser measurement device was used to obtain velocities and distance measures during all running trials. The results show a statistically significant decrease in time to 5 m for the 30-m sprint for the resistance sprint group. The squat jump and drop jump variables also showed significant increases in starting strength and height jumped for the resistance sprint group from pre- to post-testing sessions.

Rusko \(^{34}\) investigated the influences of growth, training and various training methods by analysing long-term training effects in young cross-country and biathlon skiers \((n = 129)\). Some athletes \((n = 49)\) were studied six times in three years and some at least once a year during a four year period \((n = 48)\). During three summers training period’s skiers emphasized either intensive training or distance training or continued to train normally. The results indicated that maximal oxygen uptake \((\text{VO}_2 \text{ max})\) and heart volume increased between 15 and 20 years of age and the most significant changes in heart volume were observed between 16 and 18 years of age. International level skiers were able to increase their \(\text{VO}_2 \text{ max}\) and heart volume even after 20 years of age. Anaerobic threshold \((\text{AT, ml kg}^{-1} \text{ min}^{-1})\) increased like \(\text{VO}_2 \text{ max}\).

Tsolakis and Katsikas \(^{35}\) conducted a study to evaluate the effects of a long-term physical conditioning program primarily focused on power development combined with a typical fencing training on selected neuromuscular parameters of elite Greek fencers. Five men and four women, all members of the Olympic team participated in this study. The


jumping ability (squat, countermovement and drop jump) and the leg cross sectional area were measured in six different occasions according to their annual periodisation programme. The contact time of the drop jump was significantly different between the training phases. There was not any significant different between dominant non dominant leg cross sectional areas and jumping performances in any training phase. The significant improvement in contact time without any significant changes in legs cross sectional area of this study suggests that the observed differences in contact time were probably attributed to neural training effects.

Wekesa and Langhof\textsuperscript{36} evaluate the coordinative ability of asthmatic children and to find out how this component of physical fitness is affected by a training programme of a short duration. Seventeen asthmatic children participated in the study. Their ages ranged from 9.0 to 14.5 years. Coordination was measured using the Body Coordination Test for Children developed by Kiphard and Schilling in 1974. The subjects participated three times a week in a sports programme. The results were analysed using the Wilcoxon test for dependent variables and regression analysis. We noted a significant improvement at the end of the training programme

Lovell, Cuneo and Gass \textsuperscript{37} examined the effect of aerobic training on leg strength, power, and muscle mass in previously sedentary, healthy older men (70-80 yr). Training consisted of 30-45 min of cycle ergometry at 50-70\% maximal oxygen consumption (VO2max), 3 times weekly for 16 wk, then 4 wk detraining, or assignment to a non training control group (n = 12 both groups). Training increased leg strength, leg power, upper leg muscle mass, and VO2max above. However, all gains were lost after detraining, except for some gain in VO2 max.

Gabbett \textsuperscript{38} investigated the Specificity of skill-based conditioning games and compared the effectiveness of skill-based conditioning games and instructional training for improving physical fitness and skill in junior elite volleyball players. Twenty-five junior volleyball players participated in this study. Heart rate data were collected on all players during the Australian Junior Volleyball Championships. After the competition, players were randomly allocated into a skill-based conditioning games group or an instructional training group. Each player participated in a 12-week training program that included 3 organized court training sessions per week. No significant differences were detected between competition and

skill-based conditioning games for the percentage of time spent in low-intensity, moderate-intensity, and high-intensity activities. Skill-based conditioning games induced improvements in vertical jump, spike jump, speed, agility, upper-body muscular power, and estimated maximal aerobic power, whereas technical instruction improved only spike jump and speed.

Bogdanis et al. evaluated and compared the effectiveness of two different off-season, short-term basketball training programs on physical and technical abilities of young basketball players. Twenty-seven adolescent basketball players were randomly divided into a specialized basketball training group, a mixed basketball plus conditioning training Group-And a control group. Training included five sessions per week (100-120 min each) and was performed for 4 weeks. Maximal oxygen uptake was similarly improved, Peak and mean power output measured during the Wingate test were also improved by a similar magnitude, Trunk muscle endurance was equally increased after specialized basketball training and mixed basketball plus conditioning training, but arms endurance was improved significantly more after mixed basketball plus conditioning training compared to specialized basketball training, but there was no effect

on ventilatory threshold. Performance in four basketball technical skills was similarly increased in both groups, with a tendency for greater improvement of the SP groups in the technical skills of shooting and passing.

McIntyre \textsuperscript{40} done a study to evaluate and compare the mid-season physiological profiles of elite players. Physiological assessment was carried out on 29 inter-county Gaelic footballers, 30 inter-county hurlers, and 21 League of Ireland Soccer players. Significant differences were reported for % body, aerobic capacity, flexibility, upper body strength, upper body strength endurance, abdominal endurance, and speed endurance, while there were no differences recorded for height, weight, or speed levels. A relatively heterogeneous body size is evident for all three sports. Soccer players had lower body fat levels, greater aerobic capacity, greater strength endurance, and greater flexibility compared to both Gaelic footballers and hurlers, possibly due to Specific training and conditioning programmes or physical adaptation to match play. The greater strength of both Gaelic footballers and hurlers and the superior speed endurance levels of Gaelic footballers also reflect the physical nature of the sports. Similar

speed levels amongst all three sports reflect the importance of speed for performance.

Milburn and Butts \(^{41}\) compared the physiological alterations that occur in college females as a result of a 7-wk jogging and aerobic dance-training program. Forty-six subjects volunteered to participate and included 15 dancers, 19 joggers, and 12 controls. All subjects were given a pre- and post-VO2max treadmill test. The joggers and dancers trained 4 d/wk, 30 min/d for 7 wk at an intensity that represented approximately 83 and 84% of their initial maximal heart rates, respectively. Both experimental groups significantly increased their V02max, VEmax, and maximal treadmill running times and significantly decreased their maximal heart rates as a result of the training. The control group showed no significant changes in any of the variables measured.

Mehta \(^{42}\) compared physical fitness of tribal and non-tribal school girls of Indoor Division. She used six physical fitness tests items of AAHPER Physical fitness test. The results showed that tribal girls were better in arm strength, abdominal strength and agility but non-tribal girls were better in their explosive strength and endurance.


Mokha, Anuradha and Kaur\textsuperscript{43} studied the comparison of physical fitness of urban and rural school girls of Ludhiana District. The data were collected on 404 girls, out of whom 202 were from the urban areas and 202 girls from the rural areas of the Ludhiana District. To evaluate the physical fitness the following test were conducted for each subject. (i) Anthropometric measurements: Height, weight. (ii) Physical fitness tests: 100m Race, 200m Race, High jump, long jump, shot put. It is thus conducted from the study that the urban girls are slightly taller significantly heavier than the rural girls, whereas rural girls are faster running than the urban girls because they have less body weight. Urban - Rural differences decreases as the age increase.

Agashe and Karkare\textsuperscript{44} Present study has been aimed to identify the difference of motor fitness between tribal and non-tribal sports person. 150 tribal boys (Av. age 15.53 yrs) and 150 non-tribal boys (Av. age 15.26 yrs), 150 tribal girls (Av. age 15.34 yrs) and 150 non-tribal girls (Av. age 14.02 yrs) are selected as sample. All tribal samples are selected from Krida Parisar of Chhattisgarh state. Modified JCR motor fitness test


\textsuperscript{44} C.D. Agashe and Ajay Karkare, “Comparative study between tribal and non-tribal sport-person of Chhattisgarh related to their motor fitness”, \textit{Tribal Health Bulletin} : Vol. 9 (1&2) Jan & July 2003, pp. 46-51
prepared by Cooper (1965) was administered to each subject. Results revealed that both tribal boys and girls were having significantly high speed and agility (p<0.01). In vertical jump tribal boys were superior (p<0.01). No difference was found on this dimension in tribal girls and non-tribal girls. Regarding chin-up tribal boys showed significantly more strength compared to non-tribal boys (p<0.01), but surprisingly non-tribal girls were superior in chin-up item compared to tribal girls. Results indicated that tribal boys and girls were much more fit than non-tribal boys and girls in motor fitness.

Abass\textsuperscript{45} studied the comparative effect of three modes of Plyometrics training [depth jumping, rebound jumping and horizontal jumping] on leg muscle strength of untrained University male students. Participants were forty untrained male University students. The randomized pretest-posttest control group design was adopted. Subjects were randomly assigned to control group, and three experimental groups based on the types of plyometrics training adopted for the study. The training programme consisted of twelve weeks of interval training administered three times a week. Data collected were analyzed using the mean score, standard

\textsuperscript{45} Ademola Olasupo Abass, “Comparative Effect of Three Modes of Plyometric Training on Leg Muscle Strength of University Male Students”, \textit{European Journal of Scientific Research}, Vol.31 No.4 (2009), pp.577-582
deviation and range. Analysis of Covariance was used to test for significant differences in the posttest measures among the treatment and control groups using the pretest score variation as covariates. Findings revealed that only the depth jumping and rebound jumping training significantly altered leg muscle strength of subjects.

Uppal and Roy\(^{46}\) (1987) conducted a study to assess the motor fitness components as a predictor of Soccer playing ability. Male Soccer players (N=20) were selected for the study. They were administered five tests of motor fitness components, namely, speed (50-yards dash), agility (4 x 10M shuttle run), maximum leg strength (by dynamo-meter), explosive leg strength (standing broad jump) and cardio-respiratory endurance (Cooper's twelve minute run/walk test). The Soccer playing ability was assessed with the help of a panel of three judges. Statistical treatment of the data shows all the independent variables (speed, agility, maximum leg strength, explosive leg strength and cardio-respiratory endurance), have been found to be significantly related to dependent variables (Soccer playing ability). The regression equation developed was \( \text{soccer playing ability} = 11.72 \times \text{standing broad jump} + .52 \times \text{Cooper's 12 minute's run/walk test horses in 100th unit} - 2.06 \times 4 \times 10 \text{M shuttle run} + 4.94. \)

Shukla, Venugopal and Mitra\textsuperscript{47} has done a study on the motor quality, body composition and somatotype on 900 boys, aged 10-18 years in Jawahar Novodaya Vidyalaya (JNV) and Kendriya Vidyalaya (KV) of Chhattisgarh in India. The study was aimed to compare the body composition and fitness status of the rural children of residential school with that of urban boys of non residential school. Body fat \% was calculated by using the skin folds method. It was observed that there was an increase in stature and weight with increment of age in boys of both the groups. Performance in various fitness variables also improved with the increase of age in both the groups. A comparative analysis revealed that rural boys (JNV) were better in fitness variables as compared to urban boys (KV).

Chatterjee, Jana and Jana\textsuperscript{48} done a study on Hand muscle strength, endurance capacity of hand muscles, speed and agility power have been studied in 200 Tribal and 200 Non-Tribal students of 10 different age groups. To facilitate the study, the two consecutive classes of age groups are bunched together to represent one age sub-group of 40 (forty) subjects.


They were selected from schools and colleges of Midnapore District, West Bengal. Result revealed that both the Hand grip strength and Hand muscle endurance under age groups (13-14) and (15-16) was significant in Tribal’s in respect of the Non-tribal’s. No significant changes was recorded in 50-yard Dash and Shuttle Run tests, excepting the age groups (17-18) and (19-20) where Non-tribal’s were superior to Tribal’s students.

A few studies of Soccer playing ability showing no significant differences have been found reported in the professional literature.

Bissel\textsuperscript{49} studied the effect of no warm up, skill warm up and calisthenics warm up on selected football skills, agility and speed. He concluded that there was no significant difference among these groups in football performance.

Thomas, French and Hayes\textsuperscript{50} investigated the effects of two plyometric training techniques on power and agility in youth Soccer players. Twelve males from a semiprofessional football club's academy were randomly assigned to 6 weeks of depth jump or countermovement jump training twice weekly. Participants in the depth jump group

\textsuperscript{49} F. G. Bissel, “Effect of No Warm up, Skill Warm up and Callisthenics Warm up on Selected Football Skills” \textit{Research Quarterly} 44 (October 1973): 315.
performed drop jumps with instructions to minimize ground-contact time while maximizing height. Participants in the countermovement jump group performed jumps from a standing start position with instructions to gain maximum jump height. Post training, both groups experienced improvements in vertical jump height and agility time and no change in sprint performance. Both depth jump and countermovement jump plyometrics are worthwhile training activities for improving power and agility in youth Soccer players but there were no differences between the treatment groups.

Ronnestad et al. 51 examined the effects of combined strength and plyometric training with strength training alone on power-related measurements in professional Soccer players. Subjects in the intervention team were randomly divided into 2 groups. Group 1 performed heavy strength training twice a week for 7 weeks in addition to 6 to 8 Soccer sessions a week. Group 2 performed a plyometric training program in addition to the same training as the heavy strength training group. The control group performed 6 to 8 Soccer sessions a week. Pretests and posttests were 1 repetition maximum (1RM) half squat, countermovement

jump, squat jump, 4-bounce test, peak power in half squat with 20 kg, 35 kg, and 50 kg, sprint acceleration, peak sprint velocity, and total time on 40-m sprint. There were no significant differences between the group 2 and group 1. Thus, the groups were pooled into 1 intervention group. The intervention group significantly improved in all measurements except counter movement jump, while the control group showed significant improvements only in 20kg half squat. There was a significant difference in relative improvement between the intervention Group-And control group in 1RM half squat, 4-bounce test, and squat jump. However, a significant difference between groups was not observed in 20kg, 35kg half squat, sprint acceleration, peak sprinting velocity, and total time on 40-m sprint. There are no significant performance-enhancing effects of combing strength and plyometric training in professional Soccer players concurrently performing 6 to 8 Soccer sessions a week compared to strength training alone.

Buchheit et al 52 done a study on the effect of high-intensity interval training (HIT) versus Specific game-based handball training (HBT) on handball performance parameters. Thirty-two highly-trained adolescents

were assigned to either HIT or HBT groups, which performed either HIT or HBT twice per week for 10 weeks. The HIT consisted of 12-24 x 15 s runs at 95% of the speed reached at the end of the 30-15 Intermittent Fitness Test V(IFT)) interspersed with 15 s passive recovery, while the HBT consisted of small-sided handball games performed over a similar time period. Before and after training, performance was assessed with a counter movement jump (CMJ), 10 m sprint time (10 m), best (RSA best) and mean (RSA mean) times on a repeated sprint ability (RSA) test, the V(IFT) and the intermittent endurance index (IEI). After training, RSA best, RSA mean and V(IFT) were improved, but there was no difference between groups.

Singh 53 studied with a view to compare the effects of Rope Skipping exercise and step-up exercise on cardio-respiratory endurance of the Kabaddi players. For this purpose 45 male students were selected and distributed in three equal groups. Group-A and B were experimental group i.e. Rope Skipping and step-up exercise respectively and Group-C was a control group. The result of the study revealed that both the training programs have not got significant effect on cardio-respiratory endurance.

Renata 54 had made an attempt to determine if an increase in arm strength of college women students would occur through the use of the Exer-Genie exerciser and so, whether the increase in strength would enhance the execution of the forehand and backhand drives of beginning Tennis Players. The modified Broer and Miller forehand and backhand and the wall bounds tests were given. The result proved that there is no significant improvement in strength in the experimental group.

Dorothy 55 conducted a study on the effectiveness of a Specific conditioning programme on selected Tennis skills of women intercollegiate Tennis players. Twenty-two women intercollegiate Tennis players were ranked and matched by the Hewitt Achievement test and randomly placed into control and experimental groups. The control group participated in the regular women’s intercollegiate Tennis practice. While the experimental group, in addition to the regular Tennis practice, participated twice a week in a continuous and strenuous 20-minutes conditioning programme. It was found that both groups improved significantly in cardiovascular efficiency, but there was no significant

55 Dobie Dorothy, “Effectiveness of a Specific Conditioning Programme on selected Tennis skills of Women Intercollegiate Tennis players.” Completed Research in Health, Physical Education and Recreation, 10 (1968): 122.
difference between the two groups. The experimental group did improve significantly in Tennis skills, while the control group did not.

Macbeth 56 studied the effects of interval and continuous step training on attitudes, cardiovascular fitness, and Tennis skills of beginning Tennis students. This study was compared by ANOVA. Sixty five students were placed into two experimental groups and one control group, with the experimental groups receiving a 10 minutes training session twice a week for 10 weeks. Participation in the step training programmes did not affect the student’s attitude towards Physical Education or Tennis skills. The programmes were successful in bringing about an increase in cardiovascular fitness of students.

Edward 57 conducted a study on the effect of circuit training, weight lifting and interval training on circulo-respiratory endurance. Fifty one college males from development Physical Education classes at the university, of New Mexico were randomly assigned to one of the three exercise programmes. Pre-test and Post-test measures of circulo-respiratory endurance were administered under same experimental


condition. The ANOVA showed no significant differences between the three exercise programmes in the measures of circulo-respiratory endurance.

Siewert\textsuperscript{58} examined the effect of different elementary school experiences upon achievement in certain aspect of physical fitness and sports skills; He tested 85 grades in boys (37 with rural background, 38 with urban background, and 20 with parochial school background) for speed, power, muscular endurance and skill in different games. Study of total score showed that boys with rural, parochial or urban experience did not differ in physical fitness but boys from urban and parochial school were superior in sports skills.

Murti \textsuperscript{59} (1992) the purpose of the study was to see difference in rural and urban students of Punjab in the age group of thirteen to seventeen. The study was conducted on 102 urban, 114 rural school boys selected at random selected students were test on AAHPER Youth fitness test. Investigators analyze that neither rural boys nor urban boys were superior to their counterparts.

\textsuperscript{58} Frank Siewart, “A comparison of some components of physical fitness and sports Skills of ninth grade boys of rural, urban and parochial background”, \textit{Completed Research in Health Physical education and Recreation}, 5 (1963):96.

\textsuperscript{59} Ram Murti, “Comparative study of General Physical Fitness & Rural Students of Punjab in the age group 13-17", (M. Phil thesis Punjabi University P-7-14).
Tuteja\textsuperscript{60} administered the AAPHER youth fitness test and NPED test to 100 rural and 100 urban school male students in Delhi. The age of the subjects ranged from 14 to 17 years. He has reported that the mean scores on AAPHER test were slightly higher in case of urban high school students. Whereas the mean score of the rural high school students was slightly higher than that of urban high school students, NPED test. However, none of the difference in the mean scores was found statically significant at 0.05 level of confidence.

Gregor et al.\textsuperscript{61} tested fourteen years old boys who had lived in typical rural and urban setting on Prince Edward Island. It was hypothesized that the urban boys would score better on selected fitness tests of running, jumping and sit-ups. The hypothesis proved valid except for 50-yard dash and fixed arm hang.

Boone\textsuperscript{62} administered the AAHPER youth fitness test to 100 rural and 100 boys. The urban boys were superior in physical fitness to the rural boys and differences were significant age .01 level.

\textsuperscript{60} Girish K. Tuteja, “Comparison of physical fitness of rural and urban school students”. (Unplished Master’s Thesis, Jiwaji University)
\textsuperscript{62} Nerman Boone, “ A comparison Physical Fitness level of urban and rural boys,” Completed research in Health, Physical Education and recreation, 10(1967): 86.
Roy\textsuperscript{63} made a study to compare the physical fitness of tribal and urban students in Tripura. He administered the AAPHER youth Fitness Test to 60 tribal and 60 urban students studying in MB College, Agartala. Their age range from 16 to 20 years. The mean difference between the physical fitness of urban and tribal; students was not found statistically significant at 0.05 level of confidence. It was found that urban students were better in pull-ups and soft ball throw for a distance and their performance was statically significant at 0.05 level of confidence. But in remaining five test items i.e. 50 mts/dash, 600 m run/walk, sit-ups shuttle run and standing broad jump, the performance of none of the groups was found statistically significant at 0.05 level of confidence.

**SECTION II - PERSONALITY TRAITS**

A few studies of Personality traits showing significant differences have been found reported in the professional literature.

Young \textsuperscript{64} The effect of regular exercise on cognitive functioning and personality was investigated in 32 subjects representing 4 discrete groups based on sex and age. Before and after a 10 week exercise programme of

\textsuperscript{63} Bijoy Krishna Roy, “Comparison of Physical fitness of Tribal and urban students in Tripura”, (Unpublished Master’s Thesis, Jiwaji University).
\textsuperscript{64} R. J. Young, “The effect of regular exercise on cognitive functioning and personality”. British journal of Sports Medicine, 1979 September; 13(3): 110-117
jogging, calisthenics, and recreational activities, a test battery was administered to assess functioning in a number of domains: intelligence (WAIS Digit Symbol and Block Design); brain function (Trail-Making); speed of performance (Crossing-Off); memory and learning (WMS Visual Reproduction and Associate Learning); morale and life satisfaction (Life Satisfaction and Control Ratings); anxiety (MAACL); and depression (MAACL). Improvement was observed on several physiological parameters. ANOVA revealed significant sex and age differences on Digit Symbol and Block Design and age differences on Trail-Making, Crossing-Off, Associate Learning, and anxiety. Regardless of sex and age, significant improvement in performance was observed from pre to post-test on Digit Symbol, Block Design, Trail-Making, Crossing-Off, and on Associate Learning. In addition, an increase on health status rating and decrease in anxiety were observed from pre to post-test.

Naoyuki et al. Examine how much effect a leadership skill training program had on personality traits of participants. The Funabashi Sports and Health College, a local extension program sponsored by the Funabashi Municipal government, offered the leadership skill training program in

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Chiba. A total of 139 students and their relatives participated in this study voluntarily. They answered the written questionnaire prior to and after this leadership training program. The questionnaire consisted of twenty-seven question items regarding leadership. From factor analysis, three factors were extracted and the researchers named them as 'aggressiveness', 'fairness', and 'self monitoring' respectively. ANOVA (rate×time) was conducted in order to determine the effects of leadership training program on personality traits in between prior to and after the program. It was found that 1) both of the participants and their relatives evaluated the programs effective on 'aggressiveness' traits. On the other hand, 2) participants rated the programs effective on 'fairness' traits but their relatives rated it oppositely effective. And 3) 'self monitoring' traits was rated to have no apparent effect.

Koepp! et. al in this study used the Minnesota Multiphasic Personality Inventory to detect personality changes in 53 overweight, yet otherwise healthy, males who were participating in either a weight reduction or an aerobic exercise conditioning program. Analysis of pre- and post-intervention scores revealed that only the participants in the

aerobic conditioning group demonstrated the predicted desirable psychological changes. More Specifically, this group displayed significant clinically desirable changes. Similar to the weight loss participants, a demographically matched nonintervention comparison group showed none of these desirable changes and actually yielded a significant increase. However, when compared to this "normal" group, both intervention programs showed statistically significant differences on at least two Minnesota Multiphasic Personality Inventory scales.

Elsayed 67 studied the effect of long term physical fitness programme on personality variables in adult men by using cattell's 16 personality factor questionnaire and concluded that there were personality differences between high and low fitness groups.

In a relationship study of personality traits and physical fitness of high and low skilled Soccer players, Sahu 68 concluded that high skilled Soccer players showed significant relationship with traits B (less intelligent) and L (trusting), whereas low skilled Soccer players were reserved.


68 Suprakash Sahu, "Relationship of Personality Traits and Physical Fitness in High and Low skilled Soccer Players", (Unpublished Master's Thesis, Jiwaji University, 1984).
Meiers 69 administered the cattle 16 P.F. to 110 varsity athletes of different sports. He concluded that reserve athletes were more out-going and warm-hearted than string athletes.

Tillman 70 administered A-S Reaction study of Allport, and Cattell’s 16 Personality Factors Questionnaire and found that the upper physical fitness group had a significantly higher ascendance rating on the A-S Reaction Study Test than did the lower group. The upper physical fitness Group-Appeared more surgent (F), social dependence (Q2) and less tense (Q4) than the lower physical fitness group in Cattell’s 16 Personality Factors Questionnaire.

Merriman 71 concluded that motor ability is related to personality traits. The upper motor ability group scored significantly higher than the lower motor ability group on the measures of intellectual and interest modes.

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Sharp and Reilley\textsuperscript{72} investigated the relationships between aerobic physical fitness and selected personality traits measured by the Minnesota Multiphasic Personality Inventory for college males engaged in an aerobic conditioning class. Results indicated that physical fitness scores and selected scales on the Minnesota Multiphasic Personality Inventory are related in college males and that changes in aerobic physical fitness are related to score changes on selected scales of the Minnesota Multiphasic Personality Inventory for college males who participated in an aerobic exercise program.

Richardson\textsuperscript{73} conducted the study of the relationship in college women of high and low motor ability to personality, aptitude and scholastic achievement. He concluded that the highly skilled student surpassed the low skilled in status sociability, tolerance and aptitude scores. They participated more in sports and associated with people who are more sports minded. Studies of personality traits showing significant difference between high and low skilled sportsmen have been found reported in the professional literature.


\textsuperscript{73} Reggy A. Richardson, “The relationship in college women of high and low motor ability to personality, aptitude and scholastic achievement”, \textit{Completed Research in Health Physical Education and Recreation}, 8(1966).
Gottesman\textsuperscript{74} established significant correlation between Physical Tests and Factors I (Premsia), M (Autia), N (Shrewdness) and Q\textsubscript{1} (Radicalism). The Physical Tests showed the most and best correlation with personality factors, were 160-yard run, Shuttle run, PFI, pull-ups, jump and reach, roger arm strength and push-ups on the parallel bars.

Garvin\textsuperscript{75} tested personality by using Cattell’s Personality Factors Questionnaire and Physical Fitness using Fleishman’s Basic Fitness Test and concluded that there was a strong relationship between personality and physical fitness.

Clayton\textsuperscript{76} found several low but significant correlations between attitudes towards physical actuality and some of the personality factors, and significant correlations between scores of the personality factors and three of Self-concept variables.

In a comparative study of personality profiles of high and poorly skilled men and female badminton players, Gill\textsuperscript{77} concluded that highly

\textsuperscript{74} Donald T. Gottesman, “Relationship between Cattell’s Sixteen Personality Factors Questionnaire and Physique, Structure, Strength and Motor Traits of College Men”, \textit{Completed Research in Health, Education and Recreation}, (1963):81.


\textsuperscript{77} Ranjot Gill, “Comparative analysis of personality profiles of highly and poorly skilled male and female badminton players”, (Unpublished Master of Philosophy Dissertation, Jiwaji university 1982).
skilled male badminton players were more suspicious, neither tough nor tender minded as compare to the poorly skilled badminton players, who were less intelligent, tough minded and neither trusting and suspicious.

Singh\textsuperscript{78} conducted a comparative study of psychological characteristics and socio economic status of badminton players of high and low levels of proficiency. If found high level badminton players were emotionally stable more conservative, whereas low level players were unstable and suffers from neurotic breakdown under stress and pressure.

In the study Mc clanney\textsuperscript{79} concluded that personality factor questionnaire revealed that the high physically fit group was more group dependent while low fitness group was more self-sufficient. Further it was concluded that low fit younger's appeared to be more suspicious and self-opinionated while the high fit younger's were more trusted and free of jealousy.

Sahney and Khann\textsuperscript{80} (1993) compared Nutritional status, physical fitness and personality traits of sports vs. non-sportswomen in Chandigarh.

\textsuperscript{78} Tarun Singh, “Comparative analysis of psychological characteristic and socio economic status of badminton players of high and low levels, (Unpublished Master’s Thesis, Jiwaji University 1987).
The major finding of the study were that majority of the sports girl belong to rural families and they started playing at the age of 12 to 14 years and 60 percent of them were vegetarian. Majority of the respondents in both the groups had satisfactory habits of health and personal hygiene. Sports girls were consuming more energy than their non-sport counterparts. Protein, carbohydrate, fat iron and ascorbic acid were all in very low amounts in their diet than their requirements, non-sport girls were also consuming low amount of energy protein, carbohydrate and iron. Sports girls performed significantly better on Harvard step test, recovered faster to basal heart rate and took less time in 100 meters running. Non sports women were tense, restless and impatient while sportswomen were reserved, tender minded careful and practical.

Datta\textsuperscript{81} compared the psychological characteristics and socio-economic strata in high and low fitness groups of high school boys of grade 9 and 10. He found high fitness group was significantly more warm-hearted out-going and easy –going, assertive, aggressive, competitive, stub-born and self-assured, placid, secured, serene than that of the low fitness group. The low fitness group was significantly more reserved, detached, critical, 

\textsuperscript{81} Ashwani kumar Detta, “Comparison of psychological characteristics and socio-economic strata in high and low fitness groups”, (Unpublished master of philosophy Dissertation, Jiwaji university, 1982).
and aloof and stiff, affected by feelings, emotionally less stable, easily upset and changeable, obedient, mild, easily led, docile and accommodating, shy, timid and threat-sensitive and tense-driven and overwrought than the high fitness group.

In a comparative study of psychological profiles of professional physical education male students belonging to high and low fitness groups, Bahattacharjee concluded that there were significant difference between the high and low fitness subjects in personality factors. The high fitness group was lean towards factors A (out-going), C (Emotionally stable), E (Assertive), H (Venturesome), L (Suspicious), N (Shrewd), O (Apprehensive), Q₁ (Experimenting), Q₂ (Self-sufficient), Where low fitness group was lean towards the factors B (less intelligent), F (sober), G (Expeditious), I (Tough-minded), Q₃ (Undisciplined self-conflict), Q₄ (Relaxed) in personality profiles. The high fitness group had better physical self-concept than that of low fitness groups. the high and low fitness groups did not differ significantly in other self-concept dimensions that are social, temperamental, educational, moral and intellectual although

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82 Subhasis Bhattacharjee, "Comparison of psychological profile of professional physical education male student belonging to high and low fitness groups." (Unpublished Master of philosophy Dissertation, Jiwaji University, 1989).
the total self – concept of high fitness groups was significantly higher than that of low fitness groups.

Harris\textsuperscript{83} compared high and low fitness college women in psychological traits and found that there is a tendency for the fit individual to appear morestable in certain psychological traits and to appear less anxious in others.

In a comparative study of physically fit and unfit junior high school girls, Dorothy\textsuperscript{84} concluded that physically fit students had better personality than physically unfit students.

O’connor and webb\textsuperscript{85} compared the personality traits of four groups of their collegiate female athletic competitors and one group of non competitive students by administrating the cattell’s personality factors Questionnaire and found significant difference on Four personality factors of intelligence, radicalism, self sufficiency and control.

\textsuperscript{83} Dorothy V. Harris, “Comparison of physical performance and psychological trades of college women with high and low fitness indices”, \textit{Completed Research in Health Physical Education and Recreation}, 61964:21.

\textsuperscript{84} Meeks A. Dorothy, “A comparison of physically fit and physically unfit junior high school girls”, \textit{Completed Research in Health Physical Education and Recreation}, 1966

Young and Ismail\textsuperscript{86} investigated personality difference among high fit young and old, and low fit young and old groups before and after a physical fitness programme using the 16 personality factors Questionnaire. Results revealed that regardless of age, the high fit group was more intellectually inclined, emotionally stable, composed self-confident, easygoing, relaxed, less ambitious and unconventional than the low fit group.

Bhusan et al.\textsuperscript{87} found differences in personality traits of high and low achieving badminton players. He administered 16 Personality Factors Questionnaire to 10 high achieving players who represented India at the International level and low achieving players who never achieved any distinction in their respective game. The high achievers scored significantly higher than the low achievers on dominance and surgency.

A few studies of personality traits showing no significant differences have been found reported in the professional literature.


Pierce et. al\textsuperscript{88} done a study on the effects of 16 weeks of physical exercise training on the psychological functioning of 90 patients with mild hypertension. At baseline and after 16 weeks of training, patients completed a psychometric test battery that included objective measures of neuropsychological performance and standardized self-report measures of psychosocial functioning. Patients were randomly assigned to one of three groups: aerobic exercise, strength training and flexibility exercise, or a waiting list control group. After training, there were no group differences on any of the psychological measures, even though patients who engaged in exercise perceived themselves as functioning better in a number of psychological domains.

Jhonson\textsuperscript{89} studied the relationship that existed between physical skill as measured and the general intelligence of the college students. His results indicated that there was no significant relationship between physical skill and mental power or general intelligence.


In a relationship study of motor ability and athletic participation with certain personality measures, Keogh \(^{90}\) concluded that no significant relationship was found between either motor ability or athletic participation and 18 separate scales of the CPI.

In a study of 246 male who were require taking physical education at the state University of Iowa at the beginning of the school year, Weber \(^{91}\) concluded that there was no significant relationship in between the physical fitness scores and the nine measures of personality in the minnesota Multiphasic personality inventory. He concluded that physically fit subjects had no sTable traits of personality than do physically unfit. He also found that there was no significant relationship between physical fitness scores and personality scores. The co-efficient of correlation was negative \(-0.04\).

Joe \(^{92}\) selected 40 junior high school boys participating in a weight training programme two days in a week for six months. Seventeen boys served as a control group. The test items were consisted of the junior amateur athletic union physical fitness test, anthropometric measurements, and the California test for personality. The experimental group registered a


significant difference at the 0.05 level of confidence, over the control group in anthropometric measurements and the five out of six physical fitness test items, while no significant improvement was found in personality test.

McDonald \(^{93}\) studied personality characteristic of different categories of high school female tennis players using Cattell’s Personality Factors Questionnaire. He found that successful players did not differ significantly from less successful players in any personality trait.

Anderson \(^{94}\) designed a study to determine if significant differences existed between sex and type of activity and if significant interaction in four subscales of California Psychological inventory existed. 315 volunteer undergraduate students were tested at the University of New Mexico, New Mexico State University, New Mexico Highlands University and Eastern New Mexico University. Total population comprised following groups:

1) Men varsity athletes participating in team sports.

2) Men varsity athletes participating in individual sports.

3) Women varsity athletes participating in team sports.

\(^{93}\) Kaya McDonald, “A Comparision of the personality Traits of Participants and Non-participants in High School Inter-scholastic Tennis Programme for Girls”, Dissertation Abstracts International, 31 (February 1971):3935-A.

4) Women varsity athletes participating in individual sports.

5) Women non-athletes.

6) Men non-athletes.

Following conclusions were drawn:

1) Male and female athletes do not significantly differ from male and female non-athletes on personality factors of poise, ascendance, dominance, capacity for status and sense of well-being.

2) Men and women athletes do not significantly differ from men and women non-athletes on the personality factors of socialization, maturity, responsibility, self control, tolerance and good impression.

3) Men and women athletes do not significantly differ on the personality factors of achievement via performance, achievement via independence and intellectual efficiency.

4) Men and women athletes and non-athletes significantly differ on the personality factors of flexibility and feminity, and also,
measures of flexibility and feminity were different for individual sports, team sports and non participation.

Gooch ⁹⁵ conducted a study to investigate the personality traits of highly skilled basketball and softball women athletes. He concluded that no set of personality factors differentiated between basketball and softball sport environment groups.

Parsons ⁹⁶ concluded that there appeared to be no difference in personality between champion swimmers selected to represent Canada in 1962 and champion swimmers who missed selection.

Hasrani ⁹⁷ studied fifty four female basketball players of university level and 51 female basketball players of national level and found none of the psychological variables showed significant difference in basketball performance.

SECTION III- SELF-CONCEPT DIMENSIONS

A few Studies of Self-concept Dimensions showing significant difference have been found reported in the professional literature.

Stein and Motta\(^98\) investigated the effects of aerobic and non aerobic exercise on depression and self-concept in a pretest-posttest control group design. 89 undergraduates engaged in the aerobic exercise of swimming, the non aerobic exercise of weight training, or a control, Introductory Psychology class. Dependent measures were the Beck Depression Inventory, Depression Adjective Check Lists, Tennessee Self-concept Scale, and Cooper's 12 Minute Swim. Analysis indicated that both the aerobic and non aerobic groups were equally effective in significantly reducing self-reported depression in comparison to the controls. The non aerobic condition was superior to the aerobic condition for enhancing self-concept.

Miller\(^99\) A sample of 120 children (69 boys and 51 girls), ranging in age from 9 to 14 yr., was administered the Harter Self-perception Profile for Children before and after a 5-wk. program of swimming instruction. It  

is predicted that children who improve most in swimming will also have the largest gains in athletic self-concept. The data supported the prediction for an association between gains in swimming skill and self-concept for certain skill groups.

Velez et. Al \(^{100}\) examined the effects of a structured resistance training program on strength, body composition, and self-concept in normal and overweight Hispanic adolescents. Male and female participants \((n = 28)\) were recruited from a predominantly Hispanic high school. Prior to the 12-week program, strength, body composition, and self-concept were assessed. Subjects were randomly assigned to a control group or to a resistance training group that participated in supervised strength training 3 days/week. All measures were repeated at the end of the 12-week program. Resistance training had significantly greater strength increases for bench press, seated row, shoulder press and squats. Resistance training had significant reductions in %Body Fat, whereas control group had slightly increased %Body Fat. Resistance training had an increase in condition/stamina competence, attractive body adequacy, and global self-worth from pretest to posttest, whereas no change was observed for control

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group. Resistance training resulted in significant physiological and psychological improvements in Hispanic adolescents compared to typical school-based activities.

In an experimental study, Keffer\textsuperscript{101} administered Tennessee self-concept scale to measure self-concept and coopers test to measure cardiovascular fitness of adolescent boys. Results showed improvement in the self-concept and cardiovascular fitness group showed more positive self-concept initially than the low fitness group.

Yu et al.\textsuperscript{102} examined the effects of a 6-week diet and exercise program, with emphasis on strength training, on the Physical Self-concept, body composition, and physical fitness of young overweight and obese children. Eighty-two overweight and obese children aged 8-11 years were randomized into a diet-only or a diet-and-strength training group. Self-concept, body composition and physical fitness were measured before and after the 6-week study period using the Physical Self Description Questionnaires (PSDQ), dual-energy X-ray absorptiometry (DXA), and standard fitness tests. Dietary intake was assessed with a food frequency

\textsuperscript{101} Philip L. Keffer, "The Effect of a Running Programme on the Self-concept and Cardiovascular Fitness of Pre-delinquent Institutionalized Adolescent Boys", \textit{completed Research in Health, Physical Education and Recreation}, p. 181.

questionnaire. Total daily energy intake was significantly reduced in both groups with a trend of more reduction in the diet-only group. Both groups developed greater confidence in strength. Those in the diet-and-strength training Group-Also improved their endurance self-concept. Body Mass Index (BMI) decreased significantly in both groups. Lean mass increased significantly in both groups but significantly more in the diet-and-strength training group. Handgrip, shuttle run, sit-up, and push-up were significantly improved in both groups, to a significantly greater extent in the diet-and-strength training group.

Short et al. investigated possible psychological changes in obese men after participating in an eight-week nutrition and physical conditioning program. The subjects, 45 male, metropolitan policemen who were considered at least 20 percent over their optimum body weights, were placed on diets and received weekly instruction on topics of nutrition and exercise. The subjects were randomly divided into two groups, one that participated in aerobic conditioning and one that did not. The amount of oxygen consumption, as an index of physical fitness, and performance on selected subscales of the Tennessee Self-concept Scale (TSCS) was

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measured before and after the training and conditioning programs. Both
groups displayed significant increases in oxygen consumption and on the
Physical Self and Self-satisfaction subscales, but on all these measures, the
Conditioning Group increased significantly more. For both groups, the
Total Variability measure from the Tennessee Self-concept Scale (TSCS)
showed significant reductions, which have been associated with personality
integration.

Platzer\textsuperscript{104} assessed four-and five-year-old children for deficits in
gross-motor skill and self-concept. Forty subjects were randomly assigned
to experimental and control groups. The experimental group participated in
a 30 minute per day, 5 day per week on perceptual-motor training program
for 10 weeks, while the control group received no specialized intervention
other than their regular classroom activities. Two posttests were
administered: Cratty's Six-Category Gross-Motor Test and Goodenough's
House, Tree, Person Projective Test. The experimental group performed
better on the gross-motor test, but the results were not statistically
significant. Analysis of the projective test supported the hypothesis that a
perceptual-motor program may improve the self-concept of young children.

\textsuperscript{104} W. S. Platzer, “Effect of perceptual motor training on gross-motor skill and self-concept of
Specialized intervention with perceptual-motor activities improved self-concept.

Dod, Taylor and Graham\textsuperscript{105} evaluated the effect of a home-based progressive resistance strength-training program on the self-concept of children with cerebral palsy. A randomized, controlled trial was used to evaluate the effects of a six-week strength-training program on self-concept immediately after completion of the program (week six) and at a follow-up session held 18 weeks after the initial assessment. Seventeen children with spastic diplegic cerebral palsy were recruited. Participants in the experimental group-Completed a home-based progressive resistance strength-training program using three exercises to strengthen the major support muscles of the lower limb. Participants in the control group undertook their normal daily activities. Self-concept was measured by the Self-Perception Profile for Children. However, compared with controls, the experimental group showed decreased self-concept in the domain of scholastic competence and a trend for a decrease in social acceptance at six weeks. At follow-up, the experimental group had reduced self-concept in

the domains of scholastic competence and social acceptance compared with the control group.

Mishra et al.\textsuperscript{106} Conducted a study on fifty (n=50) young women, age: 20-24 years, from the Post Graduate Departments of Utkal University, participated actively. This was a longitudinal study conducted for a period of two years. Pre-test, Post-test and follow-up tests on self-concept and body image were conducted after a yoga training intervention for three months in first year, where the follow-up was continued in the second year. The result of ‘t’ test revealed that yoga practices have definite impact on own body image and self-concept in varsity women.

Bash\textsuperscript{107} in his study of the effect of Varsity College basketball participation on the self-concept of players on selected items, concluded that members of winning teams showed a more positive change in the self-concept than that of losing teams.

Blackman et al.\textsuperscript{108} conducted a study to determine to what extent female physical fitness and self-concept are affected by dance team

\textsuperscript{108} L. Blackman, G. Hunter, J. Hilyer, P. Harrison ,” The effects of dance team participation on female adolescent physical fitness and self-concept”, Adolescence, 1988 Summer;23(90):437-48
participation in high school. Eight dancers were tested once prior to and once four months after dance team participation. Eight participants from physical education classes, matched for age, weight, height, grade, and race, were tested once at the same time as the second dance team test. Physiological tests were maximum oxygen uptake, sit-and-reach, one-repetition maximum bench press, skinfolds, and hydrostatic weighing. The self-concept tests were Coopersmith Self-Esteem Inventory, Tennessee Self-Concept Scale, and Body Cathexis Scale. Dependent one-tailed t tests were run to determine differences between dance team pre- and posttests and control and dance team posttests. Dance subjects increased maximum oxygen uptake and one-repetition maximum bench press in addition to improving their body composition as evidenced by a significant decrease in total skinfolds and a near significant decrease in percent body fat. The dance team had a significantly higher maximum oxygen uptake than did controls. Dance team participants significantly improved physical self and social self on the Tennessee Self-Concept Scale.

Boyd and Hrycaiko \(^\text{109}\) conducted a study to examine the effects of a physical activity intervention package on the self-esteem of pre-adolescent and adolescent females. The package involved three components: physical

activity, education and self-report. Subjects (N = 181) were pre-, early-, and middle-adolescent girls ranging in age from 9 to 16 who were enrolled in an independent school. An experimental pre-test/post-test design which involved two independent variables (intervention package and age group), each with three levels, was used. Self-esteem was measured with the Self Description Questionnaire I and II (Marsh, 1988). Results indicated that low self-esteem individuals benefitted from the intervention.

Salokun\textsuperscript{110} investigated the relationship between improvement in Total Positive Self-concept scores and increase in sports skills before and after training of 10 weeks for 45 minutes daily by 12- to 14-yr.-old junior high school and 16- to 18-yr.-old senior high school boys and girls. The 288 subjects were selected using a stratified (intact class) random technique. Subjects were randomly assigned to different sports, 96 to field-hockey and 96 to athletics (32 to discuss, 32 to long jump, and 32 to sprints). 96 control subjects were randomly selected from one class of each age bracket. Analysis of covariance showed that the trained subjects scored significantly higher in total positive self. A positive correlation between gain in sports skill and increase in self-concept scores was noted for both

boys and girls within each age group. Age and sex had no effect on this pattern.

Haynes and Comer\textsuperscript{111} examined the effects of the School Development Program (SDP) on multiple dimensions of students' self-concepts. The Piers Harris Self-Concept Scale was administered to 174 fourth and sixth graders, half of whom attended School Development Program (SDP) schools and half control schools. Significant positive changes in self-concept were observed among the School Development Program (SDP) students but not among the control students. Program students also showed significantly higher self-concepts on post-test measures when compared to normative samples.

On the basis of performance of three tests, The medicine ball put, The standing broad jump and Zig-Zag run, Black\textsuperscript{112} Categorized athlete and non-participants as high and low in physical skill. He found significant difference between those of high and low physical skill on Physical Self-concept, moral, ethical self-concept and family concept. In each of these cases individual of high physical skills had the higher self-concept as measured by Tennessee self-concept scale. Studies of self-concept


\textsuperscript{112} Bradley M. Black, “ The Relationship of Self-concept to Physical Skill and Athletic Participation”, \textit{Completed research in health, physical education and recreation}, p.220.
dimensions, not showing significant differences have been found reported in the literature.

Rodriguez\textsuperscript{113} undertook a Study to determine relationship between self-concept and motor ability and further to determine whether or not tenth grade Negro girls differ significantly to Caucasian girls of the same grade. 176 tenth grade girls were studied of which 88 were Negros and 88 Caucasians. The Scot Motor Ability Test Was Administered and the subjects were tested during their regular class time. The Tennessee self-concept scale was administered thereafter. Pearson ‘r’ was computed to find out the relationship, and ‘t’ test was used to find out the differences. Following conclusions were drawn:

1. Negro tenth grade girls had a low overall level of self-concept than Caucasian girls;

2. Caucasian girls were more variable and inconsistent in terms of self-concept than Negro girls;

3. Negro girls were found superior to caucasian girls in terms of leg strength and shoulder girdle strength;

4. Negro girls were found more coordinate than caucasian girls;

5. No specific differences were found in case of ball handling, ball control and leg power.

Clower\textsuperscript{114} administered AAHPER youth physical fitness test battery. Doudlah's Q-sort for movement concept and Tennessee self-concept scale on collage women to investigate the inter-relationship and the effects of an eight week activities curriculum on self-concept movement and physical fitness. The results of the study indicated that there was a moderate positive correlation for movement concept and self-esteem for low fitness subjects, movement concept related to several self-concept subscores for the low fitness subjects, but high fitness subjects exhibited a correlation only with the physical self-item.

To investigate relationship between motor performance in selected motor tasks and self-concept, Sorensen\textsuperscript{115} used Martinek Zaictikousky self-concept scale and the jump and reach test, the wall pass test and Zig-zag run test for motor performance and found significant correlation


between self-concept and performance on all three motor tasks for the sixth grade girls.

On the basis of performance of Lincoln Oseretsky Motor Development scale and Eight selected gross motor tasks, Torbert\textsuperscript{116} ranked the boys within the top and bottom 27 per cent to investigate the relationship between motor proficiency and Self-concept measured by the 'Ppers Harris Children's self-concept scale', the way I feel about myself, was more related to gross motor proficiency than to fine manipulatory motor abilities and that self-concept appears to be related to power, speed, strength and endurance.

Doudlah\textsuperscript{117} reporting significant correlation of self-concept with body-image and body-image with movement concept indicated that the subject apparently perceived themselves as a self with a boy that moves. The subject showed themselves more favorably in terms of self-concept than in terms of body image on movement concept as measured by Q-sort method.

\textsuperscript{116} Marianne Rothhas Torbert, "Relationship Between Motor Proficiency and Self-concept of sixth Grade Boys," \textit{Dissertation Abstracts International}, 32 (June 1972): 6802-A

Parker \(^{118}\) conducted a study in which the non-Physical Education major students were categorized according to low, middle and high motor ability groups and the Physical Education major group was classified as a separate high motor ability group. The 71 college women showed no relationship between motor ability and Self-Concept as measured by “who am I” Twenty Statements test. Self-Concept differed significantly between the non-physical education major Group-And physical education major group.

Young \(^{119}\) administered that AAHPER youth Fitness test, Tennessee self-concept scale and Questionnaire concerning academic achievement, estimation and perception to grade Seventh and ninth boys and girls in the study on relationship amongst achievement, physical fitness and Self-concept: significant correlation was reported between various sub-scale scores of Tennessee Self-concept scale and dependent variables. A significant relationship between Self-concept and physical fitness was indicated for seventh grade boys\((r = 41)\).


Salokun\textsuperscript{120} Nigerian high school athletes (112 high and 90 low in performance) and 108 nonathletes were administered the Tennessee Self-concept Scale. Athletes scored significantly higher on all self-concept subscales except behavior, moral-ethical and family. Better athletes scored significantly higher on all aspects of self-concept: social, moral-ethical, family and behavior, as is consistent with findings from the USA and other countries.

Johnson\textsuperscript{121} carried out to gain an understanding of the interrelationship between Negro and White male students’ level of fitness. He found out that Negro high school boys were superior to white boys in strength, cardio-vascular endurance, state of health, physical appearance, skill and sexuality. A greater relationship between physical fitness and self-concept was found among whites than among Negro high school students.

In a study on high school basketball players, Koenig\textsuperscript{122} found that personality differ existed between athletes and non-athletes with respect to

\textsuperscript{120}S.O. Salokun, “Comparison of Nigerian high school male athletes and non athletes on self-concept”, \textit{Perceptual and Motor Skills}, 1990 Jun;70(3 Pt 1):865-6.

\textsuperscript{121}Joseph Benjamin Johnson, “ A Comparison of physical Fitness and Self-Concept between Junior High School Negro and White Male Students”, \textit{Dissertation Abstracts International}, 31 (April 1971): 5180-A

\textsuperscript{122}Frances Backer Koenig, “Comparative Analysis of selected Personal and Social Background characteristics of High school Girls at Three Levels of Participation in Basketball,” \textit{Dissertation Abstracts International}, 30 (December 19690 : 2361- A.
sociability, group orientation and emotional control. Both varsity team members and intramural players had higher self concept than non-participants.

Vincent\textsuperscript{123} compared the self-concept of college women athletes and physical education majors. The Tennessee self-concept scale was administered to college women (N=460) athletes and non-athletes, physical education majors and general college students and participants and non participants in high school competitive athletic programmes to determine whether difference existed among these groups in self-concept scores. Women physical education majors and participants in high school competitive athletic programmes were found to have significantly higher self-concept scores than all other groups, non-physical education major, athletes, non-athletes, and non-high school participants.

Sherrill\textsuperscript{124} conducted a study on elementary school children scoring in the highest and lowest 26\% or 27\% of their classes on the Texas Physical Fitness test were compared for attitude toward physical education and self-concept. Data were collected on the Children's Attitude Inventory toward Physical Education, a Game of Pairs for Preferences among School


Subjects, and the Children's Self-concept Scale. Analysis of variance indicated significant differences on all tests between boys high in fitness, girls high in fitness, boys low in fitness, and girls low in fitness. Subsequent Scheffé tests indicated that highly fit girls had significantly higher attitude and self-concept scores than boys low in fitness. Highly fit boys had higher self-concepts than boys low in fitness.

In her study on Assessment of self-concept of high and low fitness groups of physical education students, Choubey\textsuperscript{125} concluded that high fitness group had significantly higher self-concept regarding the physique, temperament qualities, social attitudes, educational status and intellectual abilities.

Breedlove\textsuperscript{126} has determined Predicted performance of Women collegiate gymnasts based on selected personality traits and professed self-concept using the Jackson’s personality Research form and the Tennessee self-concept scale. Results indicated significant correlation between gymnastic ability and self-concept measures of physical self, moral, and ethical self. (Total variability and column total variability.


A few studies of Self-concept Dimensions showing no significant differences have been found reported in the professional literature.

Hutzler et al. 127 studied the effect of an experimental movement and swimming program of six months on motor function in the water measured by means of the Water Orientation Score and self-perception measured by means of the Martinek-Zaichkowsky Self-concept Scale was investigated. 23 children participated in the program, completing both tests prior to and after the intervention. An age-, sex-, and disability-matched control group of 23 children completed only the Self-concept Scale at pre- and post-test. Analysis indicated a significant improvement in Water Orientation Score of children in the trained group, but no effect on scores of the Self-concept Scale.

Messinco 128 investigated that effect of physical activity, influence of gender and test session on strength and test sessions on strength and self-concept of at-risk high school students, 42 male and female students were given physical activities of weight training and paddleball for 9 weeks, twice a week, self-concept and strength were measured thought Tennessee.


Self-concept scale (TSCS) and Military press, Bench Press, Lateral Pull and Leg Press respectively. From the findings it was concluded that (1) significant gain in strength could be achieve through Weight training as compare to paddle ball; (2) gain in strength did not affect gain in physical, personal or total self-concept for both males and females at at-risk school students.

Ford et. al determined the effects of participation in selected physical activities on scores of self-concept, body-cathexis and four items of health-related fitness. 88 women in university physical education service classes participated 3 hr. per week for 8 wk. in one of five activities (aerobic dance, jogging for fitness, swimming for fitness, life saving, and weight training). A total of 108 subjects participated in the study, with 20 students in health science classes serving as the controls. Few differences were noted between the activity groups and the controls on the posttest with pretest scores controlled. Specifically, joggers and aerobic dancers performed significantly more sit ups than did the controls, and joggers, aerobic dancers, weight trainers, and those in the lifesaving group displayed significantly greater flexibility on the sit and reach test than did

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the controls, on the posttest. None of the activity groups differed from the
controls regarding self-esteem, body cathexis, body fat, or the step test
scores at posttest.

Jette\textsuperscript{130} Studied the effect of modern dance and music on body image
and self-concept in college women.\textsuperscript{100} female volunteers from the
University of Muin were randomly divided into classes in one of the 6
treatment groups. Groups 1 and 4 participated in modern dances with
musical accompaniment. Groups 2 and 5 participated in the music with
rhythmical activities. Groups 3 and 6 were the control. The 4 experimental
groups met 1 hour / day, 3 days /week, for seven weeks. After the treatment
period, no significant difference in the body image or self-concept was
found between classes or groups.

Martinek, Cheffers and Zaickhousky\textsuperscript{131} Study the effect of Organized
Physical activity on the development of Specific motor skill and self-
concept. They concluded non-significant correlation between motor skill
and self-concept.

\textsuperscript{130} Nedine Jette, "The effect of modern dance and music on body image and self-concept in
\textsuperscript{131} Thomas J. Martinek, John T. F. cheffers and Leonar D. Zaickhousky," physical activity,
motor development and self-concept: race and age differences", \textit{Perceptual and motor skill}, 46
(febuary 1978):47.
Mason\textsuperscript{132} indicated that there was no significant relationship between self-concept and fitness performances of white women college students and no significant difference in self-concept of the three groups white American, Indian and black women college students.

Floyed\textsuperscript{133} reported absence of significant (.05 level) Linear relationship between Physical performance and self-concept. The result of this study also indicated that there was no significant relationship between Physical performance and self-description, Physical performance and self acceptance, Physical performance and ideal concept, Physical performance and discrepancy score.

Richard, Donald and Ray\textsuperscript{134} reported that there was no significant relationship between Physical ability and self-concept of junior High school boys.

Asci and Akkok\textsuperscript{135} tested whether physical fitness training combined with group-Counseling was more effective for enhancing self-concept of

\textsuperscript{132} Willa Faye Mason."An investigation of the Relationship between self-concept and physical fitness of white American Indian and black women college student." \textit{Dissertation Abstracts international}, 40(September 1979):1346-A
\textsuperscript{133} Connie Sturkie Floyed "Relationship between Physical performance and self-concept", \textit{Dissertation Abstracts International}, 33(June 1973):6712-A
\textsuperscript{134} Kay S. Richard, Felker W. Donald and Varoz O Ray."Sports interest and abilities as contributors to self-concept in junior High school boys", \textit{Research quarterly}, 43(may 1972):208
women university students than counseling, fitness training, or a control condition. 68 women students voluntarily participated. The physical fitness group, the counseling group, the physical fitness training combined with counseling group, and the lecture control group were formed by the students of two intact classes, General Physical Conditioning and Sports and Exercise Psychology. The Tennessee Self-concept Scale was administered before and after the 10-wk. treatments. No significant treatment by time interaction or treatment effect was obtained for the global self-concept.

Hilmi and Marrison\textsuperscript{136} has studied on athletes (N = 100), representing men and women for both high school and college, were compared to 100 non-athletes in their self-concept and self-actualizing traits. Female high school athletes and male college athletes did not differ significantly from their counterparts.

\textsuperscript{136} Ibrahim Hilmi and Nettie Marrison, "Self-actualization and self-concept among Athletes," \textit{Research Quarterly}, 47 (October 1976) : 68