The accumulated research in all disciplines has encompassed a host of sub-areas within the field in each discipline and interdisciplinary fields, with the result that the present day researches seem to be altogether different from the studies which were conducted in the past. Therefore, the survey of the literature is an important step. The survey enables the investigator to expand upon the context and background of the study to help further, to define the problem and to provide an empirical basis for the subsequent development of hypotheses. The survey of the literature is equally important in finding the research gaps and helping the researcher to formulate assumptions and hypotheses for further investigation. A thorough analysis and an eagle glance into the whole gamut of the subject clearly reveal that a serious investigation has not been conducted in this area. It seems that the investigators have been avoiding investigating on the subject in Srinagar for reasons best known to them. There are, no doubt, many handicaps in this respect like lack of information but this cannot become the sole cause for lurching this subject of so much importance for the upliftment and growth of sports in the area. There may not be studies directly concerning the subject but investigative activity related to the subject is plenty to be unearthed. There is enough evidence to supplement the study being conducted on the subject at the school level. These studies and materials can provide useful direction to the investigators to pursue their venture in the right direction. These studies could act as a plinth for the structure to be erected later with entirely new mortar and bricks. The
investigator has gone through numerous such related studies and for reference is mentioning some of them briefly and in abridged form.

Research scholar has made sincere efforts to gather the ideas related to the present study. The investigator has tried his level best to collect and quote the findings on the relative studies conducted in the directions on physiological, Physical and anthropometrical components of the Sports and Non-sports persons. The research scholar also gone through the numerous studies, which have been conducted on different components of Physical Fitness, factors of Adjustment, Body Mass Index and Anthropometric variables. The research scholar also attempted to review the literature available with the various libraries related to Psychology, Physical Education, Sports and Education in different parts of Kashmir as well outside state. Some of the most important studies which were found out by the researcher in the libraries like: Faculty of Education Kashmir University, Iqball Library, Kashmir University and Library of Indira Gandhi Institute of Physical Education and Sports Sciences (IGIPESS) University of Delhi. Along with the help of personal collection of various literatures, Books, Research Journals, Research Articles and Material etc. The Researcher has also tried to scan the available literature to selected studies, which were directly or indirectly related to the present study. An attempt has been made to present a summary review of literature, which was helpful in understanding and bringing out meaningful outcomes from this study.

The following related references have been reviewed as under:

1. Studies on Physical Fitness
2. Studies on Anthropometry
3. Studies on Adjustment
4. Studies on Personality Traits
1. STUDIES ON PHYSICAL FITNESS

Das Provash & Mishra Piyali (2015) A comparative study on selected fitness components of 13-19 years female basketball and volleyball players

The purpose of the study was to observe the Difference in Hand - Eye Coordination, Accuracy, Agility Hand Explosive Strength, and Leg Explosive Strength between Female Basketball Players & Volleyball Players. A total of Twenty Two (22) Female subjects were selected for this study. Out of them 11 were from Basketball, 11 were from Volleyball. The ages of the subjects were 13-19 years old. Selected Fitness Components of the subjects were the criterion measure for the present study. Selected Fitness Components were: This included- leg Explosive Strength, Hand Explosive Strength, Hand Eye Coordination, Agility and Accuracy. The leg Explosive Strength was measured by Vertical jump. Hand Explosive Strength was measured by putting the Shot. Hand Eye Coordination was measured by Rebound Ball Test. Accuracy was measured by Accuracy test. Agility was measured by (4x10 m.) Shuttle Run. In respect of Accuracy, Agility, Hand Explosive Strength, leg Explosive Strength, there were no significant difference Between Female Basketball and Volleyball Group. In respect of Hand – Eye coordination Female group of Basketball players were better than the volleyball players of Female group.


This research attempted to determine the state and trait anxiety of sports and non-sports personnel. To investigate the state and trait anxiety of athletes and non-athletes, 200 adolescents and divide according to sports and non-sports personnel (100 from each group) and 50 girls and 50 boys were selected from each sports and non-sports groups. Spielberger, Gorsuch, Lushane, Vagg and Jacobs (1983) State-Trait Anxiety Inventory (STAI) was administered on them.
Mainly three conclusions were drawn from the study: 1. The Sports personnel possessed less state and trait anxiety than non-sports personnel. 2. Trait anxiety of sports girls was low as compared to non-sports girls. 3. Sports girls showed less trait anxiety than sports boys.

**Das Suprakash (2015) Comparative Study on Selected Strength and Bag Ajoy,**  
**between Non Sports Performer and Sports Performer College Student of Jamboni Block of West Bengal**

Purpose of the study was to compare the strength between sports perform students and non sports perform students. They studied, twenty-five(25) sports perform college student were selected from the Seva Bharati Mahavidyalaya (SBM) boys hostel .Other twenty-five(25) college student fifteen randomly selected from dept. of commerce & science of Seva Bharati Mahavidyalaya. Age ranges between 19 to 23 year. The selected strength were evaluated in the present study throw sit-up>abdominal strength, pull-up> arm/shoulder strength, standing broad jump>leg explosive power, selected variables were tested according to “AAPHER youth test Battery” and “t” test used to test the hypothesis.

**Sandeep Sharma, Mahesh Singh Dhapola (2015) Effect of Speed, Agility, Quickness (SAQ) Training Programme on Selected Physical Fitness Variables and Performance Ability in Basketball Players**

The purpose of this study was to determine effect of SAQ training programme on selected physical fitness variables (Speed, Agility and Quickness) and performance ability of university level male Basketball players, age ranging from 19 to 25 year. For this study Twelve University player selected of the Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G) was assigned in a one experimental group. All these training programme were imparted a total period
of 6 weeks. The one training sessions was conducted three days a week (Morning session) of 30-45 minutes duration. The speed was measured by using 50-meter sprint run, Agility was measured by 4 x 10 meter shuttle run, quickness by 10-meter sprint run and performance ability of basketball players was measured by using Johnson Basketball test. The following tests items were performed in Johnson basketball test i.e, field goal speed test, throw for accuracy and speed dribble test. The data was collected before and after six weeks of SAQ training programme. The data was analyzed by applying paired T test Technique to find out the effect of S.A.Q. training programme on selected physical fitness and performance ability of basketball players. The level of significance was set at 0.05. The following conclusion was drawn i.e. SAQ training programme showed significant effect on speed.


The Purpose was to assess the effect of exercise-induced muscle damage on muscle hardness and evaluate the relationship between muscle hardness and muscle damage indicators. Seven men performed the single-leg ankle plantar flexion exercises involving both concentric and eccentric contractions (10 sets of 40 repetitions). The hardness of the medial gastrocnemius (MG) was evaluated using ultrasound real-time tissue elastography before, from day 1 to 4, and day 7 after exercise. The strain ratio between the MG and a reference material was calculated. Simultaneously, we evaluated the magnetic resonance T2 value (an index of edema) of the triceps surae, the ankle dorsiflexion range of motion (ROM), and calf muscle soreness. Serum creatine kinase activity was assessed before, 2 and 4 h, and from day 1 to 4 after exercise. The study that the MG showed lower strain ratio, indicating increased muscle hardness, on day 4 post-exercise ($P < 0.01$) and higher T2 values on days 1–7 post-exercise.
(P < 0.01) relative to each pre-exercise value. The ankle dorsiflexion ROM was lower on days 2–4 post-exercise (P < 0.01). The serum creatine kinase markedly increased on days 3 and 4 post-exercise (not significant). The degree of muscle soreness among the post-exercise time points was similar. The decreased strain ratio did not correlate with the increased T2, the decreased joint ROM or muscle soreness. Muscle hardness increased after strenuous resistance exercise, but the change was not related with muscle edema, decreased joint ROM, or muscle soreness resulting from muscle damage.

**Yadav Maya & Kanta Rohilla (2014) A comparative study of physical fitness among sportsmen and non-sportsmen students in Bhiwani district of Haryana**

In the study, an attempt has been made to compare the physical fitness components namely speed, strength between sportsmen and Non-sportsmen student belonging to Bhiwani District of Haryana. The study was carried out on 50 female students 25 sportsmen and 25 non – sportsmen female person of Bhiwani. The data was collected by different coaching camps. The age of the selected subjects ranged from 18 to 25 years. 50 meter dash test, and standing broad jump test were used to measures the selected physical fitness components of the students in order to realize the datamt-test was used to analyze the data and investigator observed the significant different between sportsmen and non-sportsmen students of different selected physical fitness components.

**Sanjaya Kumar (2014) A comparative analysis on physical fitness of rural and urban high school students: A case of Bagalkot**

The purpose of the study was to find out A Comparative Analysis on Physical Fitness of Rural and Urban High School Students. This study will help coaches and physical education teachers in selecting the good players. This will help
physical education teachers and coaches in preparing training programme. This will lead to success in future planning. This will reveal which of the two groups possess better physical education. The result of the study will help to students to participate in sports and game. The result of the study will give the clear idea about physical fitness of the rural and urban boys.

Sanja Mazic, Jelena Suzic (2014) The impact of elevated blood pressure on exercise capacity in elite athletes

The aim of the study was to assess the impact of elevated blood pressure (BP) on exercise capacity in athletes and evaluate the differences in left ventricular structure and function. Elite male athletes (n = 517, aged 23 ± 5 years) underwent Doppler echocardiography with tissue Doppler imaging. Diastolic function was assessed by measuring peak early and late transmitral (E and A) and annular diastolic filling velocities (e’ and a’). Maximal cardiopulmonary exercise testing was performed to measure maximal oxygen consumption (VO₂ max), ventilator anaerobic threshold (VAT) and heart rate reserve (HRR). After BP measurement, they were grouped according to the ESH/ESC guidelines on: optimal (OBP), normal (NBP), high normal BP (HNBPM), and hypertensive (HT). Results shows a significantly lower VO₂ max, VAT and HRR in the groups with HNBPM and HT, after the adjustment for the type of sport, body fat content and age. There was an increasing trend in resting HR among groups (p < 0.001). Even in the absence of structural or functional heart damage, elevated BP in elite athletes, together with the presence of autonomic dysfunction, leads to decrease in exercise capacity. Staging of hypertension according to the BP level, on the one hand, and reflection of BP on cardiopulmonary capacity, on the other, may be coupled for further risk stratification.

The aim of this study is therefore to assess physical fitness among urban and rural adolescents and its associations with blood lipid profile in a middle-income country. Methods: A cross-sectional study was conducted between January 2008 and April 2009 in 648 Ecuadorian adolescents (52.3% boys), aged 11 to 15 years, attending secondary schools in Cuenca (urban n = 490) and Nabon (rural n = 158). Data collection included anthropometric measures, application of the EUROFIT battery, dietary intake (2-day 24 h recall), socio-demographic characteristics, and blood samples from a subsample (n = 301). The FITNESGRAM standards were used to evaluate fitness. The associations of fitness and residential location with blood lipid profile were assessed by linear and logistic regression after adjusting for confounding factors. Results The majority (59%) of the adolescents exhibited low levels of aerobic capacity as defined by the FITNESSGRAM standards. Urban adolescents had significantly higher mean scores in five EUROFIT tests (20 m shuttle, speed shuttle run, plate tapping, sit-up and vertical jump) and significantly most favorable improved plasma lipid profile (triglycerides and HDL) as compared to rural adolescents. There was a weak association between blood lipid profile and physical fitness in both urban and rural adolescents, even after adjustment for confounding factors. Physical fitness, in our sample of Ecuadorian adolescents, was generally poor. Urban adolescents had better physical fitness and blood lipid profiles than rural adolescents.
Aim of this study was to determine the comparative analysis of motor fitness components of sprinters. To obtain data, the investigators had selected sixty (N=60), Male Inter-College and Inter-University Level Sprinters between the age group of 18-25 years were selected. The subjects were purposively assigned into three groups: Group-A: Sprinters (n1=60) Inter-College (n1a=30) and Inter University (n1b=30). To determine the significant differences of motor fitness components between Inter-College and Inter University Sprinters, unpaired t-test was employed for data analyses. To test the hypothesis, the level of significance was set at 0.05. To conclude, it is significant to mention in relation to motor fitness components that insignificant differences occur between Inter-College and Inter-University Sprinters on the sub variable agility, balance and flexibility. However, the significant differences occur between Inter-College and Inter-University Sprinters on the sub variable speed and explosive strength.

Debastiani S.D., Carroll D.D., Cunningham M. (2014) Awareness and knowledge of the youth 2008 physical activity guidelines for Americans

Investigated to measure parental awareness of government physical activity guidelines and knowledge of the amount of physical activity recommended for youth (ie, 60 minutes per day, 7 days per week) as specified in the 2008 Physical Activity Guidelines for Americans. A cross-sectional national sample of adults responded to physical activity guideline questions added to the Health Styles survey in 2009 (n = 1552). The prevalence of parents aware of government physical activity guidelines and knowledgeable of the youth physical activity guideline, specifically, was estimated overall and by parental demographic characteristics (sex, education, income level, race/ethnicity, age
group, marital status) and body mass index. In 2009, 34.8% of parents reported being aware of physical activity guidelines, and 9.7% were knowledgeable of the amount of physical activity recommended for youth. Many parents lack awareness and knowledge of the youth physical activity guidelines. The low prevalence estimates suggest the 2008 Physical Activity Guidelines for Americans has not been effectively disseminated. These results may also indicate a need for effective communication strategies to educate and inform parents, an important influence of children's health behaviors.

Kumar Surender & Chaudhary Parul, 2014 Comparison of Motor Fitness Components between Judo and Wrestling Female Players

The purpose of the present study was to find out the comparison of motor fitness between Judo and Wrestling female players of Rohtak District. The sample of the Present study was conducted on 60 male sports person 30 each who had participated at interuniversity level. The age ranged between 18-25 years. Endurance – is the ability to do sports movement with the desired quality and speed under conditions of fatigue. Flexibility – flexibility is an ability of the human being to carry out movement with large amplitude. Further the data of motor fitness test was collected through standardized tools cooper 12 min run/walk test for (Endurance) and forward bend and reach test for (flexibility) and data was analysis by “t” test. After comparing of the present data it was found that Judo female players of Rohtak have better flexibility and endurance wrestling female players.


The aim of the study was to examine the association between physical fitness and depressive symptoms in 300 BCT soldiers from May to July, 2012 at Fort
Jackson, Columbia, SC. Soldiers completed a baseline Army Physical Fitness Test (APFT) and survey within one week of arriving at BCT, and an end of cycle survey after eight weeks of BCT. Soldiers were assigned to the "high" fitness category if they had a passing score on the standard APFT of greater than or equal to 180 points out of 300 points. Soldiers scoring less than 180 points on the APFT were assigned to the "low" fitness category. Depressive symptoms were measured using the 20-item Center for Epidemiologic Studies Depression Scale. In multivariate analyses, adjusting for baseline demographics, self-reported sleep prior to BCT, Army identification, and depressive symptoms, the odds of reporting depressive symptoms were 60% lower for soldiers in the high fitness category (odds ratio, OR 0.40; 95% confidence interval, CI 0.19-0.84), compared to soldiers in the low fitness category.

**Kumar Amit (2014) A Comparative Study of Endurance and Agility between Rural and Urban Male Basketball Players**

The purpose of the study was to compare the endurance and agility between rural and urban male basketball players. 40 Basketball player (20 each) players of Rohtak was selected, ranged from 15 to 19 years of age. Only (Endurance and Agility tests) were used to measures the selected physical fitness variables of the players. The study was delimited to AAHPER youth fitness test. In order to analyze the data t-test was used to analyze the data and investigator observed the significant different between Rural and Urban basketball players of Rohtak.

**Kumar Anil (2014) Comparison status of strength and speed between Kho-Kho and Kabaddi male players**

The purpose of the study was to compare the physical fitness variable of Kho-Kho and Kabaddi Players. To fulfill the objective of the study, (25 Kho-Kho and 25 Kabaddi) players. Only those male players were selected who have
participated at minimum inter collegiate level. The data were collected in different coaching camps organized by the university. The age of the selected subjects ranged from 19 to 25 years. (Standing Board Jump and 60 yard dash tests) were used to measure the selected physical fitness variables of the players. In order to analyze the data, t-test was used to analyze the data and investigator observed the significant different between Kho-Kho and Kabaddi players.


In the present study, an attempt has been made to compare the Motor fitness variables namely Endurance and Agility between K.U.K and M.D.U Female Boxers. The study was carried out on 50 female Boxers (25 K.U.K and 25 M.D.U female Boxers). The data was collected by different coaching camps. The age of the selected subjects ranged from 19 to 29 years. 400 M run test for Endurance and Shuttle Run for Agility. The test were used to measure the selected Motor fitness Variables of the players in order to realize the data t-test was used to analyze the data and investigator observed the there was no significant different between K.U.K and M.D.U female Boxers of different Motor fitness Variables tests.


To measure awareness of government physical activity guidelines and knowledge of the amount of physical activity recommended for youth (ie, 60 minutes per day, 7 days per week) as specified in the 2008 Physical Activity Guidelines for Americans. Methods: A cross-sectional national sample of
adults responded to physical activity guideline questions added to the Health Styles survey in 2009 (n = 1552). The prevalence of parents aware of government physical activity guidelines and knowledgeable of the youth physical activity guideline, specifically, was estimated overall and by parental demographic characteristics (sex, education, income level, race/ethnicity, age group, marital status) and body mass index. In 2009, 34.8% of parents reported being aware of physical activity guidelines, and 9.7% were knowledgeable of the amount of physical activity recommended for youth. Many parents lack awareness and knowledge of the youth physical activity guidelines. The low prevalence estimates suggest the 2008 Physical Activity Guidelines for Americans have not been effectively disseminated. These results may also indicate a need for effective communication strategies to educate and inform parents, an important influence of children’s health behaviors.


Adolescent anthropometric and fitness data were collected during the participants of high school years (N = 15,896) and their corresponding health examination data from adulthood were taken from the National Health Insurance Corporation (NHIC) in Korea. A total of 1,006 participants (6.3%) were analyzed in the study. Result shows that the odd ratios (ORs) for being overweight (BMI ≥ 25 kg/m²) during adulthood was 11.87 (95% CI: 4.19,33.59) in men and 8.44 (95% CI: 1.78,40.02) in women, respectively, in the fattest group vs. The leanest group during adolescence. Participants with low fitness levels during adolescence were more likely to be overweight and have abnormal MetS risk factors in adulthood vs. those with high fitness levels. Joint exposure analyses of fatness and fitness showed that male participants who were more fat and unfit during adolescence had 4.11 (95% CI: 1.19,14.14)
and 3.04 (95% CI: 1.17.11.12) times higher risk of having abnormal glucose and MetS risks during adulthood, respectively. Fatness and fitness levels during adolescence appear to be significantly associated with the MetS risk factors and prevalence in adulthood in Koreans.

Shahid Bashir and Rajkumar P. Malipatil (2013) A Comparative study of Cardiovascular Fitness between Sportsperson and Non Sportsperson

The study highlights how endurance of sportsperson and non sportsperson plays a substantial role in developing cardiovascular fitness. In general endurance is an integral part of our body, on one hand, serving as a barometer of human progress, endurance have been drawn the attention of whole society across the entire world and cardiovascular ability of sportswomen and non sportswomen plays predominant role for shaping the of sportsperson, present study reveals that there is significant positive effect of cardiovascular on sportsperson non sportsperson practitioners comparing to their counterpart, the calculated ‘t’ value of emotional adjustment and health adjustment are greater than table value and significant at 0.05 level.


The objective of this study was to compare eating habits and physical activity of young adults according to their body weight, gender and place of residence. The study involved a group of 18-year-olds from rural and urban environments. The study included 50% girls and 50% of boys in each group, selected by simple random sampling (SRS). The investigator designed questionnaire evaluating the nutrition habits and physical activity was provided. It was found that in the group of boys the value of BMI was markedly higher than in girls. Compared to the normal weight, young overweight adults ate meals more
frequency, the majority preferred meat dishes, more often ate under the stress, and had lower physical activity. It was found that gender had a significant impact on the studied parameters. The girls ate meals more frequent during the day, the majority preferred fruit and vegetable, but had lower physical activity than the boys. It was found that the young adults from the rural area preferred fast food and frequently ate sweets. Compared to the subjects from the urban environment, the young adults living in the countryside consumed fewer meals daily and were more physical active. About a half of the studied adults were not satisfied with their weight, and nearly 40% of the subjects in both groups admitted that they had made effective or ineffective attempts to lose weight. The lifestyles of young people in rural and urban areas were slightly different; however, dietary factors which predispose to weight gain were comparable in both groups. In the rural areas, the most frequent nutritional faults were a preference for fast food, frequent consumption of sweets, and few meals during the day. A positive aspect of the lifestyle of young people in the rural areas was a relatively high level of physical activity and the small effect of stress on excessive consumption.


Investigator examined prevalence of regular exercise in leisure times and some related factors in middle aged men and women in northern Iran. A cross-sectional survey was undertaken on 1425 women and 676 men in two main cities in northern Iran. Information on exercise habits was collected using a self-administrated questionnaire. Regular exercise was defined as any kind of recreational or sport physical activity other than walking performed three or more days per week for at least 20 minutes. Questions on perceived barriers on regular exercise, walking habit were also included in the questionnaire. Findings showed that 11.2% of the participants (9% in women and 12.8% in
men P<0.05) did exercise regularly. Prevalence of doing regular exercise was inversely related to age in women but not in men. Educated women were more likely to do regular exercise. The most common perceived barrier for regular exercise was time insufficiency. Only a small proportion of the study men and women had sustainable regular exercise for one year. Regular exercise was more common among young and well educated women than older women and the men.

**Shaikh Shafiuddin & Khan Nazma (2012) A Comparative of Physical Fitness among Athletes and Non-Athletes**

Aim and Objective of the study was to find out the physical fitness among athlete and non-athlete. For the present study 100 Sample were selected from Dr Babasaheb Ambedkar Marathwada University, Aurangabad, 50 subjects were athlete and 50 subject’s non-athlete. The age range of subjects was 18-26 years. Pune University Physical Fitness test was used for measuring Physical Fitness. For data collection first permission has been taken from respective sources than the despondence has been selected for data collection. Personal data sheet (PDS) has been given to collect the preliminary information with respect to subject's related variables then standardized lest administer to the subjects. Before that rapport was established with subjects- And they have been told that their responses were kept confidential and the information is used for research purpose only. The result's related lo the first hypothesis have been recorded In Table Mean of physical fitness score of the athlete is 54.83 and that of the non athlete 49.68 The difference between the two mean is highly significant ‘t’ = 731, df= 58, P< 0.01. Thus the first hypothesis is confirmed athlete have significantly better physical fitness than the non-athletes.

**Quadri Syed Javeed (2011) A Comparative of Physical Fitness among Athletes and Non-Athletes**

The purpose of the study was to examine the enthusiasm among male and female kho kho players. The study was conducted on 100 male kho kho players.
and 100 female kho kho players of Aurangabad town. Multi assessment personality series (MAPS, 1996) tool were used the study. Besides these, a PDS was used to get the other necessary information relating to the respondents. Subjects were tested on measures of static and explosive muscular strength, static and dynamic muscular endurance, cardiovascular endurance, and flexibility. MANOVA and follow-up univariate ANOVAs indicated that the higher the grade, the better the performance; males outperformed females on all measures except flexibility; and athletes were superior to nonathletes on all six test items. Furthermore, (a) there was no difference between athletes and nonathletes at grade 3, athletes were considerably better than nonathletes by grade 7, and the magnitude of the difference was virtually the same at grade 11, (b) the fitness superiority of athletes over nonathletes was essentially of the same magnitude for males as for females at each grade level. It was conclusion that Male kho kho players will significant high Enthusiasm than the female kho kho players.


To achieve the purpose of study 130 sportswomen who had participated in inter-collegiate athletic meet were selected. Firstly personal data schedule was used to collect the information related to personal and socio demographic status of the subject and Socio-economic status scale developed by Bharadwaj and Chavan (1989) was administered. Then 68 sportswomen divided into two groups of 34 each as high and low SES groups by random sampling out of total population. Secondly the Self confidence Inventory by M. Basavanna (1975) and Achievement Motivation Test developed by Dr. Beena Shah were administered two groups respectively and found that positive and significant influence of socioeconomic status on self confidence and achievement motivation of sportswomen and there is a significant difference in self
confidence and achievement motivation level between low and high socioeconomic status sportswomen. Significant relation between socioeconomic status and self confidence, socio-economic status and achievement motivation of sportswomen was also found. On contrary the low SES group of sportswomen because of their strong desire to win and succeed, the fear and humiliations associated with failure, the urge to grow and develop might have influenced them to adopt the higher achievement motivation.

**Seenimurugan. M & V. Jeya veerapandian (2011) Effect of Resistance Endurance Training and Combined Training on Selected Physical Fitness Variables.**

The purpose was to find out the effect of resistance training, endurance training and combined training on selected physical fitness variables. Sixty male students aged between 17 and 22 years were selected for the study. They were divided into four equal groups, Group I underwent resistance training, group II underwent endurance training, group III underwent combination training, three days per week for twelve weeks and group IV acted as control, which did not participate in any training. The subjects were tested on selected criterion variables such as leg strength, back strength and cardio-respiratory endurance at prior to and immediately after the training period. For testing the leg strength and back strength, the dynamometer was used and to test the cardio-respiratory endurance, the Cooper’s 12 minutes run/walk test was administered. The analysis of covariance (ANCOVA) was used to find out the significant difference, between the experimental groups and control group on selected variables. Since there were four groups involved in the present study, the Scheffé S test was used as post-hoc test. The selected criterion variables were improved significantly for all the training groups when compared with the control group and the leg and back strength were improved significantly for combined training group and resistance training group, and in cardio-
respiratory endurance, the endurance training group and combined training groups were significantly improved.

Jayaraman S. (2011) Effect of Weight Training and Fartlek Training on elected Physiological Variables among College Men Students

To achieve the purpose of the study, forty five men students were selected randomly as subjects and divided in to three groups namely resistance training group, fartlek training group and control group of fifteen subjects in each groups and the subject’s ages ranged from 18-23yrs. All the subjects were tested on selected variables prior to and immediately after the training period. The selected criterion variables such as cardio respiratory endurance was measured by Copper’s 12 min/walk test and resting pulse rate was measured by counting the pulse rate per minute. The analysis of covariance (ANACOVA) were used to find the significant difference if any, among the experimental and control groups on selected criterion variables separately. In all the cases, 0.5 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there were three groups involved in this study the Scheffe’s test was used as posthoc test. There were significant improvements in the variables such as leg strength, muscular endurance, vital capacity, resting pulse rate and cardio respiratory endurance due to physical training on the experimental groups. Participation in physical training resulted in a significant development in the physical fitness variables such as leg strength, strength endurance and cardio respiratory endurance on experimental groups when compared to control group.

The main purpose of the study was to compare the Physical fitness, Reaction ability and Kinesthetic Perception among 25 national level Gymnasts, twenty five Kho-Kho players and 25 professional Dancers belonging to male categories of 15 to 20 years. The variables taken under physical fitness was Explosive Strength, Agility and Flexibility as well as Reaction Ability and Kinesthetic Perception. In order to investigate the existence of significant difference in Physical Fitness Components, Reaction Ability and Kinesthetic Perception among three groups, Analysis of variance statistical technique was used. Results showed insignificant difference among the national level Gymnasts, Kho-kho players and professional Chow dancers in relation to Explosive Strength, Agility, Flexibility, Reaction Ability and Kinesthetic Perception at 0.05 level of significance.


Studied the interrelationship between aerobic fitness, body composition, and physical activity in 9- and 15-year-olds on 270 participants selected from 18 primary and secondary schools in Iceland. Aerobic fitness was assessed by a graded exercise test on a bicycle ergometer. Body composition was estimated via: logarithm of sum of four skin-folds skinfolds, waist adjusted for height, and body mass index (BMI). Physical activity was measured with Actigraph activity monitors using total activity each day as the physical activity variable. Aerobic fitness was chosen as the primary outcome variable, body composition as the secondary variable, and physical activity as the tertiary variable. All the full models explained a similar proportion of fitness variance for both age
groups (45–65%). Among the 15-year-olds, skinfolds explained a significantly larger proportion of the fitness variance (54%) than waist adjusted for height (29%) and BMI (15%), but all the body composition variables explained a similar proportion of the fitness variance (35–42%) among the 9-year-olds. Physical activity explained a smaller proportion (0%) of the unadjusted variance in fitness for the 9-year-olds than for the 15-year-olds (19%). This group difference became non-significant (0% vs. 4%) when adjusting for loge skinfolds but remained significant when controlling for waist adjusted for height (0% vs. 15%) and BMI (0% vs. 18%). Gender differences in aerobic fitness after puberty can largely be explained by gender differences in loge skinfolds and physical activity. In conclusion, the interrelationship between fitness, body composition, physical activity, and gender is not the same among 9- and 15-year-olds.

**Poltorak (2009) The significance of environmental factors for physical development**

The purpose of the study was to determine the influence of environmental factors on boys and girls at puberty. The sample of both the groups was studied using comprehensive measuring data and information from the survey. To examine correlations between qualitative and quantitative data the factor analysis was used (One-Dimensional Test “f” for every variable). The biological indices stratification of adolescents under study were the results of medicine ball throw test and MAP (maximal anaerobic power). The MAP was calculated using results of the standing broad jump test. The highest level of physical development as noted among the group of students with best environmental conditions. The majority of the subjects came from rural areas and the families with single child and good financial conditions had a high level of physical development. Their parents had good academic back ground too. The study enhance the physical fitness of young people the pre pubescence period should be used better. During this period, children should get
opportunity to take part in various co-curricular classes during their schooling to develop their physical fitness.

**Elaine Constance (2009) Physical activity levels of Urban and Rural young children in the Iowa Bone Development Study**

The thesis used data from the Iowa Bone Development Study (IBDS) to examine activity behaviours of young children in urban and rural Iowa. Mean daily minutes of moderate through vigorous physical activity (MVPA) and vigorous physical activity (VPA), as recorded by accelerometry-based physical activity monitoring in the IBDS, were compared by level of socioeconomic status (SES) and census block type (urban or rural). Media use (television and videogames), in hours per day by parental report, was similarly compared. Logistic regression was used to assess the association of census block type (Urban or Rural) with lower categories of MVPA and VPA, and with a high category of media use (exceeding the American Academy of Paediatrics’ (AAP) recommendation for ≤ 2 hours/day of media). Mean age of the 400 participants included in this thesis was 5.65 years (SD = 0.53), females comprised 53.5%. Children’s mean daily minutes of MVPA and VPA were not significantly different among SES levels nor between urban and rural census blocks. Rural children had decreased odds for lower categories of MVPA, but not significantly so. Lower SES boys and girls engaged in more daily media use (hours/day) than higher SES children, and a higher proportion of low SES children exceeded the AAP recommendation than did middle-level or high SES children. Rural boys media use (2.7 hours/day) was higher than that of urban boys (2.3 hours/day) (95% CI: 0.06, 0.80 hours/day), whereas urban and rural girls' media hours/day were not significantly different. Odds for excess media use were higher for rural boys and for low SES boys as well as for low SES girls. Although rural and urban children’s MVPA and VPA did not differ in this thesis, rural and low SES boys had both higher daily media hours and increased odds for exceeding AAP media recommendations. Odds for excess media also
were increased for low SES girls. Interventions to improve healthy behaviours of young children by limiting screen-based recreation and/or supplying means for alternate activity and play opportunities may be especially beneficial when focused on lower SES and rural areas.

**Peter L Kristensen, Line Olesen, Mathias Ried Larsen, Anders Grøntved, & Lars Andersen (2008)** *Between-school variation in physical activity, aerobic fitness, and organized sports participation: A multi-level analysis*

A large proportion of a child’s day is spent at school interacting with certain physical surroundings, teachers, and school friends. Thus, schools could have a marked impact on establishing physical activity habits. The aim of the present study was to assess between-school variation in physical activity, aerobic fitness, and organized sports participation. Altogether, we tested 1766 nine- and fifteen-year-old children attending 242 school classes at 35 different schools in Denmark in 1997–2003. The intra-class correlation coefficient (ICC) for objectively assessed physical activity ranged between 0.06 and 0.18 depending on the dimension of physical activity and the time considered (i.e. school time vs. leisure time). For aerobic fitness, an ICC of 0.10 was observed, whereas that for organized sports participation ranged between 0.01 and 0.10 depending on the age group. Studying between-school variation in physical activity provides information about the extent to which children adjust their physical activity habits according to the social and environmental circumstances that they share, and helps to plan future school-based physical activity studies, especially in terms of sample size and power calculation.
The aim of the study was to see differences in physical activity, physical fitness, and overweight prevalence of children among rural and urban subjects. The increasing prevalence of overweight in youth has been well chronicled, but less is known about the unique patterns and risks that may exist in rural and urban environments. A better understanding of possible rural-urban differences in physical activity profiles may facilitate the development of more targeted physical activity interventions. 1,687 boys and 1,729 girls were recruited from fourth, fifth, and sixth grade classes in schools from urban areas, small cities, and rural areas. Multilevel modeling analysis was used to examine rural-urban differences in physical activity and prevalence of overweight. Physical activity was assessed by self-report and body mass index was calculated from measured height and weight. Prevalence of overweight was higher among rural children than children from urban areas (19%) and small cities (17%). Urban children were the least active overall particularly around lunchtime while at school Children from small cities reported the highest levels of physical activity. The results of this study suggest there are rural-urban differences in children's prevalence of overweight and physical activity even within a fairly homogenous Midwestern state.

Church, T.S., Earnest, C.P., Skinner, J.S., Blair, S.N. (2007) Effects of different doses of physical activity on cardio respiratory fitness among sedentary, overweight or obese postmenopausal women with elevated blood pressure: A randomized controlled trial

The objective of the study was to examine the effect of 50%, 100%, and 150% of the NIH Consensus Development Panel recommended physical activity dose
on fitness in women. Randomized controlled trial of 464 sedentary, postmenopausal overweight or obese women whose body mass index ranged from 25.0 to 43.0 and whose systolic blood pressure ranged from 120.0 to 159.9 mm Hg. Enrollment took place between April 2001 and June 2005 in the Dallas, Tex, area. Intervention: Participants were randomly assigned to 1 of 4 groups: 102 to the non-exercise control group and 155 to the 4-kcal/kg, 104 to the 8-kcal/kg, and 103 to the 12-kcal/kg per week energy-expenditure groups for the 6-month intervention period. Target training intensity was the heart rate associated with 50% of each woman's peak VO₂. Main Outcome Measure: The primary outcome was aerobic fitness assessed on a cycle ergometer and quantified as peak absolute oxygen consumption (VO₂abs, L/min). Results showed that the mean (SD) baseline VO₂abs values were 1.30 (0.25) L/min. The mean (SD) minutes of exercising per week were 72.2 (12.3) for the 4-kcal/kg, 135.8 (19.5) for the 8-kcal/kg, and 191.7 (33.7) for the 12-kcal/kg per week exercise groups. After adjustment for age, race/ethnicity, weight, and peak heart rate, the exercise groups increased their VO₂abs compared with the control group by 4.2% in the 4-kcal/kg, 6.0% in the 8-kcal/kg, and 8.2% in the 12-kcal/kg per week groups (P<.001 for each vs control; P for trend <.001). There was no treatment x subgroup interaction for age, body mass index, weight, baseline VO₂abs, race/ethnicity, or baseline hormone therapy use. There were no significant changes in systolic or diastolic blood pressure values from baseline to 6 months in any of the exercise groups vs the control group. Conclusion: In this study, previously sedentary, overweight or obese postmenopausal women experienced a graded dose-response change in fitness across levels of exercise training. Trial Registration: clinicaltrials.gov Identifier: NCT00011193. ©2007 American Medical Association. All rights reserved.
Thomas Little And Alun G. Williams (2005) Specificity of acceleration, maximum speed, and agility in professional soccer players.

This study comprised 106 professional soccer players who were assessed for 10-m sprint (acceleration), flying 20-m sprint (maximum speed), and zigzag agility performance. Although performances in the three tests were all significantly correlated (p, 0.0005), coefficients of determination (r2) between the tests were just 39, 12, and 21% for acceleration and maximum speed, acceleration and agility, and maximum speed and agility, respectively. Based on the low coefficients of determination, it was concluded that acceleration, maximum speed, and agility are specific qualities and relatively unrelated to one another. The findings suggest that specific testing and training procedures for each speed component should be utilized when working with elite players.


The aim of the study was to check the effects of aerobic training on performance during soccer match and soccer specific tests. Nineteen male elite junior soccer players, age 18.1 _ 0.8 yr, 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, monitored by video during two matches, one before and one after training. Results: In the training group: a) maximal oxygen uptake (VO2 max) increased from 58.1-4.5 mL·kg/1·min/1 to 64.3 - 3.9 mL·kg/1·min/1 (p < 0.01); b) lactate threshold improved from 47.8 -5.3 mL·kg/1·min/1 to 55.4 / 4.1 mL·kg/1·min/1 (p <0.01); c) running economy was also improved by 6.7% (p <0.05); d) distance covered during a match increased by 20% in the training group (p < 0.01); e) number of sprints increased by 100% number of involvements with the ball increased by 24% the average work intensity during a soccer match, measured...
as percent of maximal heart rate, was enhanced from 82.7 to 85.6 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. Conclusion: Enhanced aerobic endurance in soccer players improved soccer performance by increasing the distance covered, enhancing work intensity, and increasing the number of sprints and involvements with the ball during a match.

Dhar Vivek (1999) Comparative study of Selected Physical Fitness Variable of Inter – Collegiate Soccer and Non Soccer players

The purpose of the study was to compare the specific physical fitness variable of Inter – Collegiate Soccer and Non Soccer players who participated at Inter collegiate level. Thirty (30) Soccer players and thirty (30) non Soccer players were randomly selected. The test battery designed by Paul, was employed. The ‘t’ test was employed. The results indicated that the significant difference was found for the status of physical fitness among soccer and non-soccer players.


Cardio respiratory fitness and body fatness are both related to health, but their interrelation to all-cause and cardiovascular disease (CVD) mortality is unknown. Objective: they examined the health benefits of leanness and the hazards of obesity while simultaneously considering cardio respiratory fitness. Design: This was an observational cohort study. They followed 21925 men, aged 30-83 y, who had a body-composition assessment and a maximal treadmill exercise test. There were 428 deaths (144 from CVD, 143 from cancer, and 141 from other causes) in an average of 8 y of follow-up (176742 man-years). After adjustment for age, examination year, cigarette smoking,
alcohol intake, and parental history of ischemic heart disease, unfit (low cardio respiratory fitness as determined by maximal exercise testing), lean men had double the risk of all-cause mortality of fit, lean men (relative risk: 2.07; 95% CI: 1.16, 3.69; P = 0.01). Unfit, lean men also had a higher risk of all-cause and CVD mortality than did men who were fit and obese. We observed similar results for fat and fat-free mass in relation to mortality. Unfit men had a higher risk of all-cause and CVD mortality than did fit men in all fat and fat-free mass categories. Similarly, unfit men with low waist girths (< 87 cm) had greater risk of all-cause mortality than did fit men with high waist girths (≥99 cm). The health benefits of leanness are limited to fit men, and being fit may reduce the hazards of obesity.


Objective of the study was to compare the 24-month intervention effects of a lifestyle physical activity program with traditional structured exercise on improving physical activity, cardio-respiratory fitness, and cardiovascular disease risk factors. Randomized clinical trial conducted from August 1, 1993, through July 31, 1997. Participants Sedentary men (n = 116) and women (n = 119) with self-reported physical activity of less than 36 and 34 kcal/kg per day, respectively. Interventions six months of intensive and 18 months of maintenance intervention on either a lifestyle physical activity or a traditional structured exercise program. Main Outcome Measures Primary outcomes were physical activity assessed by the 7-Day Physical Activity Recall and peak oxygen consumption (VO2 peak)) by a maximal exercise treadmill test. Secondary outcomes were plasma lipid and lipoprotein cholesterol concentrations, blood pressure, and body composition. All measures were
obtained at baseline and at 6 and 24 months. Results indicated that both the lifestyle and structured activity groups had significant and comparable improvements in physical activity and cardio respiratory fitness from baseline to 24 months. Conclusions In previously sedentary healthy adults, a lifestyle physical activity intervention is as effective as a structured exercise program in improving physical activity, cardio respiratory fitness, and blood pressure.

**Vats Aarti, (1998)**  
Comparative study of Motor Fitness Components Among the Physical Education and Non- Physical Education students

The purpose of the study was to compare the physical fitness level of Physical Education and Non- Physical Education students. The AAHPERD Youth physical Test battery was conducted on sixty female students of IGIPRESS, University of Delhi. The non-physical fitness students were studying through correspondence courses. The subjects were divided into high and low physical fitness group on the basis of their fitness status. The age ranged from 16 to 25 years. The ‘t’ variables were indicating significant differences from ‘t’ value at flexed arm hang indicating at 5.28 and sit up at 2.19 and standing broad jump at 2.24 and 600 yard run/walk was at 2.80 and 50 yards at 2.84 and shuttle run at 3.01. Physical education students were found to be superior on motor fitness components as compared to non-physical education female students.

**Dunn AL, Garcia ME, Marcus BH, Kampert JB, Kohl HW, Blair SN. (1998)** Six-month physical activity and fitness changes in Project Active, a randomized trial

A randomized clinical trial (N = 235) comparing a lifestyle physical activity program with a structured exercise program in changing physical activity and cardio-respiratory fitness Methods: Sedentary but healthy adults (N = 235) aged 35-60 years received 6 months of intensive intervention. Analysis of covariance (ANCOVA), adjusting for baseline measure, age, gender, body
mass index (BMI), cohort, and ethnicity, showed that at 6 months both lifestyle and structured groups significantly increased energy expenditure over baseline (P < 0.001). Both groups significantly increased moderate intensity activity from baseline, but the increase was significantly greater in the lifestyle group than the structured group (P = 0.02). In contrast, the structured group increased its hard activity more than the lifestyle group, but the difference was not significantly different (P = 0.18). Very hard activity significantly increased (P < 0.01) for both groups by 0.25 kcal·kg⁻¹·d⁻¹. Conclusion: Both intervention approaches are effective for increasing physical activity and fitness over a 6-month period in initially sedentary men and women.

Sharma (1996) Relationship of selective Physical Fitness Variables with socio-Economic Status

The purpose of the study was to study the socio economic status of physical education students of Delhi University in relation to selected physical fitness variables. 30 male and 30 female subjects were randomly selected from IGIPESs University of Delhi, studying in three year course. The age of the subjects were ranged from 17-20 years. In view of the socio-economic status, the more boys were selected belonged to middle class as compared to girls. None of the male student belonged to financially low class. No female or male student selected belonged to lower- lower class. All the selected physical fitness variables (standing broad jump, sit-ups, 50 yard dash, shuttle run, 12/19 minutes run and push-ups) were statistically significant at .05 level. Whereas, socio economic status and selected physical fitness variables in both the sexes was found significant.

To evaluate the relationship between changes in physical fitness and risk of mortality in men. Clinical examinations to assess change or lack of change in physical fitness as associated with risk of mortality during follow-up after the subsequent examination. Participants were 9777 men given two preventive medical examinations, each of which included assessment of physical fitness by maximal exercise tests and evaluation of health status. The highest age-adjusted all-cause death rate was observed in men who were unfit at both examinations. The lowest death rate was in men who were physically fit at both examinations. Men who improved from unfit to fit between the first and subsequent examinations had an age-adjusted death rate of 67.7/10 000 man-years. This is a reduction in mortality risk of 44% (95% confidence interval, 25% to 59%) relative to men who remained unfit at both examinations. Improvement in fitness was associated with lower death rates after adjusting for age, health status, and other risk factors of premature mortality. For each minute increase in maximal treadmill time between examinations, there was a corresponding 7.9% (P=.001) decrease in risk of mortality. Similar results were seen when the group was stratified by health status, and for cardiovascular disease mortality. Men who maintained or improved adequate physical fitness were less likely to die from all causes and from cardiovascular disease during follow-up than persistently unfit men. Physicians should encourage unfit men to improve their fitness by starting a physical activity program.

Sallis, J.F, (1992) Explanation of vigorous physical activity during two years using social learning variables

This study examined determinants of vigorous physical activity in a community sample of adults over a 24-month period. Social learning theory predicts that
causal relationships between determinants and behavior are bidirectional, and both the behaviour and its influences are subjects to change over time. Thus, dynamic variables were expected to account for more variance in exercise change than static baseline variables. Over 86% of respondents to the baseline mail survey completed follow-up surveys 24 months later, yielding a final sample of 1739. Two physical activity change indices were constructed that were adjusted for baseline exercise and demographic variables, so that the effects of social learning variables could be isolated. In a two-step hierarchical regression analysis, physical activity measures were regressed onto 21 static and six dynamic independent variables. Baseline self-efficacy was a significant predictor of exercise change for both dependent variables. Four dynamic social learning variables were significantly associated with both exercise change measures: self-efficacy, perceived barriers, family support, and friend support. Social learning variables accounted for 12.3-15.5% of the variance in exercise change over 24 months. The results provide strong support for bidirectional causation between behaviour and determinants and suggest hypotheses to be tested in experimental studies.

Wendell Taylor & Tom Baranowski (1991) Physical Activity, Cardiovascular Fitness, and Adiposity in Children

With cardiovascular Fitness (CVF) as the dependent variable, relationships with habitual level of physical activity, age, gender, and body mass index (BMI) were investigated in a sample of 93 high adiposity and 93 low adiposity children, ages 8 to 13. A physical activity score (PAS) was computed for each child from a 2-day observation period. A physical working capacity index from cycle ergometry was the measure of CVF. Low and high adiposity samples were classified by a median split on the sum of three skinfold measures (tricep, suprailiac, subscapula). For the high adiposity sample, PAS, age, BMI, and gender were significant and the overall model was significant (p < .001), accounting for 38 % of variance in PWC<sub>170</sub>. In the low adiposity sample,
gender (p < .04) was significantly related to CVF, but the overall model was not significant (p < .35). PAS, thus, was a significant predictor of CVF among the high adiposity children, but not the low adiposity children. Mechanisms that may account for this difference include greater work for equal activity among the obese, a ceiling effect on CVF among the low adiposity children, or differences in hormonal or metabolic factors mediating the activity-CVF relationship.

Caspersen, C.J, Powell (1985) Physical activity, exercise and physical fitness: definitions and distinctions for health-related research

Physical activity, exercise and physical fitness are terms that describe different concepts and meanings. They are often confused with one another, and the terms are sometimes used interchangeably. Investigator proposes definitions to distinguish them. Physical activity is defined as any bodily movement produced by skeletal muscles that result in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities. Exercise means physical activity that is planned and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness. Physical fitness is a set of attributes that are either health- or skill-related. The degree to which people have these attributes can be measured with specific tests. These definitions are offered as an interpretational framework for comparing studies that relate physical activity, exercise, and physical fitness to health.

Hans Sjoberg (1980) Physical fitness and mental performance during and after work

Two groups of subjects who differed in Physical fitness (24 well-trained and 24 less well-trained male students) participated in an experiment concerned with
mental performance during and after Physical work. The Physical work was matched between the groups in terms of the percentage of maximal work capacity. Three mental tasks were used: task I involved high information load, placing great demands on continuous concentration and switching of attention as well as on short-term memory; task 2 involved paired associate learning with recall following short and long retention delays; task 3 was a multiplication task with great demands on concentration and on short-term memory. Tasks 1 and 2 were performed during the four different work-load conditions and task 3 after the Physical work. As expected, heart rate during Physical work was about the same in both groups. No intergroup difference was found in mental performance during Physical work. However, recovery rate in terms of heart rate was faster, and mental performance after Physical work was significantly better in the fit group than in the unfit group. The results indicate that, even though Physical workloads were matched between the groups to make subjective effort equal, the fit subjects were more able to resist the negative after-effects of Physical effort.


As a result of eight week of interval training Changes in sub-maximal and maximal HR and VO\textsubscript{2} were studied in boys aged 10–12; 13 boys trained while 11 acted as controls. Training HR's averaged approximately 90% of the mean maximal HR. VO\textsubscript{2} max did not change significantly with training. The apparently high threshold for a training effect on the VO\textsubscript{2} max in children is probably related to their naturally active lives: the stresses induced by short-term training are probably small as compared to the overall activities of children. On the other hand, sub-maximal heart rate during bicycle and treadmill exercise decreased significantly with training. The O\textsubscript{2} cost of these sub-maximal tasks remained unchanged. The findings suggest that the use of VO\textsubscript{2} max as the only training criterion for cardio respiratory fitness may be
misleading. Since most work tasks proceed at a sub-maximal rate, and a training-induced improvement in sub-maximal response was demonstrated without improvements at maximal effort, perhaps sub-maximal physiological and performance measures are more important than maximal ones in the assessment of cardio respiratory fitness.

2. STUDIES ON ANTHROPOMETRY


The aim of the study was to assess the effect of weight reduction on some selected anthropometrical parameters i.e., body mass index (BMI), body fat percent (BF %) and lean body mass (LBM). The subjects for the study were twenty four boxers, ranging in the age group between 16 – 17 years. The data was collected at the time of the training camp held at Jawahar Lal Nehru Stadium, New Delhi. The selected parameters such as age, body weight, standing height and skinfold measurements (Durnin and Wormsley, 1974) were taken on the day of joining the camp. The body weights of all the subjects were obtained again ten days prior to competition and one day before the competition ONGC, YMCA, VIII, International Boxing Championship. For the purpose of the present study the subjects who reduced their body weight more than one percent were selected for the further study and the following parameters such as body weight, standing height their body mass index (BMI) was computed by applying Quetelet Body Mass Index method, (Collins, 1990), and body fat measurement (BF%) and lean body mass (LBM) were calculated by applying (Siri, 1965) equation. To see the effects of weight reduction on above said parameters the difference change and percent change were applied in pre and post scores of the boxers. The findings of present research were concluded that out of twenty two subjects only four reduced
body weight by minimum 1.45 percent and 4.31 percent maximum during the
camp and weight reduction indicated a gradual pattern. The result indicates that
body mass index and fat percentages among the four boxers were reduced
simultaneously lean body mass had increased.

Tae Nyun Kim, Man Sik Park, You Jeong Kim, Eun Ju Lee, Mi-Kyung Kim, Jong Chul Won (2014) Association of low muscle mass and combined low muscle mass and visceral obesity with low cardio respiratory fitness

The associations between CRF and low muscle mass and combined low muscle mass and visceral obesity were examined in 298 apparently healthy adults aged 20-70 years. Low muscle mass was defined using a skeletal muscle mass index (SMI) that was calculated using dual energy X-ray absorptiometry. CRF was measured using a cycle ergometer test. CRF level correlated positively with SMI and negatively with VFA. Individuals with low muscle mass had lower CRF values than those without low muscle mass. After adjustment for age, sex, lifestyle factors, and markers for insulin resistance and inflammation, participants in the lowest quartile of CRF had an odds ratio (OR) for low muscle mass of 4.98 compared with those in the highest quartile and an OR for combined low muscle mass and visceral obesity of 31.46: Individuals with lower CRF exhibited increased risk of low muscle mass and combined low muscle mass and visceral obesity. These results suggest that low CRF may be a potential indicator for low muscle mass and combined low muscle mass and visceral obesity in Korean adults.


The aim of the study was to assess the effect of weight reduction on body composition among Indian male Boxers. Twenty two boxers, ranging in the age group between 18 – 26 years. The data was collected at the time of the Pre
London Olympic training camp held at Netaji Subas National Institute of Sports, Patiala, India, from March, 2012 to July, 2012. The selected parameters such as age, body weight, standing height and skinfold measurements (Durnin and Wormsley, 1974) were taken one week after the day of joining the camp (March, 2012). The body weights of all the subjects were obtained again three weeks prior (July, 2012) to the London Olympic Games 2012. For the purpose of the present study the subjects who reduced their body weight more than one percent were selected for the further study and the following parameters such as body weight, standing height their body mass index (BMI) was computed by applying Quetelet Body Mass Index method, (Collins, 1990), and body fat measurement (BF%) and lean body mass (LBM) were calculated by applying (Siri, 1965) equation. To see the effects of weight reduction on above said parameters the absolute change and percent change were applied in pre and post scores of the boxers. The findings of present research were concluded that out of twenty two subjects only four reduced body weight by -3.46 percent changes during the camp and weight reduction indicated a gradual pattern. The result indicates that body mass index and fat percentages among the four boxers were reduced simultaneously and lean body mass had increased.

Barend P. (2014) Interrelations between anthropometric and fitness changes during mid-adolescence in boys: A 2-year longitudinal study

The objectives of the study was aimed to determine changes and interrelationships between changes in selected anthropometric growth parameters and motor and physical fitness, among boys over a 2 year period during mid-adolescence. Speed, agility, hand-eye coordination, explosive power, muscle strength, and aerobic endurance were measured once a year, and the anthropometric measurements (stature, body mass, sitting height, arm span, and sitting height ratio), were measured three times per year, 4 months apart (among 73 adolescent boys). A hierarchical linear model, adjusting for
covariates and partial correlation analysis ($R^2$) were used to analyze the data. All anthropometric, motor, and physical measurements improved significantly over the two-year period. Significantly, greater changes were seen between 13 and 14 years in stature, arm span, sitting height and body mass. Changes in muscle strength, speed and agility were mainly significant between 13 and 14 years while the biggest changes occurred in explosive power and upper-body-arm-and-shoulder-strength during year 2 (14-15 years). The majority of interrelationships, indicating moderate to small relationships, were found between changes in stature, arm span, and sitting height, and changing strength, speed, agility, and hand eye coordination over the two-year period, after adjusting for maturity age and physical activity levels. Conclusion: Motor and physical fitness improved significantly from 13 to 15 years, showing definite interrelationships with anthropometric growth during the mid-adolescence period. Awareness and education about these changes are recommended as it can have significant effects on the sport performance and fitness training of boys during mid-adolescence.

Neeta Kumari & (2014) A Study of Weight Reduction on some selected Anthropometrical Variables among Male Senior National Boxing Campers

The aim of the study was to assess the effect of weight reduction on some selected anthropometrical parameters i.e., body mass index (BMI), body fat percent (BF %) and lean body mass (LBM). The subjects for the study were twenty two boxers, ranging in the age group between 18 – 26 years. The data was collected at the time of the Pre London Olympic training camp held at Netaji Subas National Institute of Sports, Patiala, India. The selected parameters such as age, body weight, standing height and skinfold measurements (Durnin and Wormsley, 1974) were taken one week after the day of joining the camp (March, 2012). The body weights of all the subjects were obtained again three weeks prior (July, 2012) to the London Olympic
Games 2012. For the purpose of the present study the subjects who reduced their body weight more than one percent were selected for the further study and the following parameters such as body weight, standing height their body mass index (BMI) was computed by applying Quetelet Body Mass Index method, (Collins, 1990), and body fat measurement (BF%) and lean body mass (LBM) were calculated by applying (Siri, 1965) equation. The findings of present research were concluded that out of twenty two subjects only four reduced body weight by minimum 1.45 percent and 4.31 percent maximum during the camp and weight reduction indicated a gradual pattern. The result indicates that body mass index and fat percentages among the four boxers were reduced simultaneously lean body mass had increased.

**Bhavik Mankodi (2014) A Comparative Study of Muscular Strength and Body Mass Index between Physical Education Students and Police Trainers**

The purpose of the study was to find out the comparison of muscular strength and body mass index between physical education students and police trainees. The study was delimited to the 40 male subjects. The age group of the subjects is ranged between 18-28 years. 20 each subjects were selected for this research between physical education students and police trainees. For muscular strength pull ups test and for body mass index height and weight was measured. On basis of obtained data Mean score, standard deviation and t- value was find out and it was found that there was statistically significant difference of muscular strength and body mass index among physical education students and police trainees.

**Jayakumar C., S. (2013) Analysis of selected hand anthropometric measurements among south west zone interuniversity male handball players**

The purpose of this study was to analyze the selected hand anthropometric measurements among south zone inter university male handball players. The
selected players right and left hand length and width were measured on 144 male handball players who had right hand as dominant hand. These players took part in south west zone inter university handball tournament for the year 2010-2011 organized by S.R.T.M University, Maharashtra. The hand length and width was selected as criterion variable and measured by vernier caliper, gulick tape and measuring scale. The collected data was analysed using ANOVA, when F is found to be significant Tukey HSD post hoc test was applied. The result of the study showed that right hand length (F = 1.61, p = 0.126) and left hand length (F = 1.19, p = 0.308) show no significant difference between the groups. However, right hand width (F = 5.450, p = 0.000) and left hand width (F = 6.302, p = 0.000). It shows that Rajasthan university handball players showed greater hand width on both hands than other team players. It can be concluded that hand width shows significant variations among the south west zone inter university handball tournament. The criterion variables which are selected in the present study show significant impact on griping the ball. Human beings possess different hand anthropometric dimensions either narrow or broad which are distributed in the normal population, with slight male/female differences in the median and range values. One such dimension with these gender differences is hand shape. Numerous hand-grip strength studies with healthy adults have shown that anthropometric variables, such as height, weight, hand length, and hand width, are positively associated with grip strength, as are other anatomical variations, such as the presence of a flexor digitorum superficialis tendon in the little finger. These selected subjects, who practice handball regularly and take part in competition. The mean ± SD of age, height, weight and BMI were 21.42 ± 1.82 year, 1.76 ± 0.074 m, 66.0 ± 9.26 kg and 21.58 ± 2.27 respectively on average, the players had 5.9 ± 2.1 year of playing experience and represented various format of competition. The variable selected in this study was right and left hand length and width which were measured by vernier caliper, gulick tape and measuring scale. Statistical
techniques. The selected hand grip strength was statistically examined by applying analysis of variance (ANOVA). When F ratio was found significant, Tukey HSD post hoc test was applied. This statistical work was done with the help of SPSS 11.5 version and output reproduced as it is.

Singh Arvind (2012) Relationship of selected anthropometric measurements between BMI and WHR in tribal Boys of Age 6 Through 9 Years

The purpose of the study was to assess the selected anthropometric measurements among the boys aged 6 through 9 years. For this purpose, a sample of 200 boys aged 6 through 9 years were selected randomly (50 boys in each age group). The anthropometric variables selected were weight, height, waist circumference and hip circumference. To find out the relationship between BMI (Body Mass Index) and WHR (Waist-Hip Ratio) for each age group namely- 6, 7, 8, and 9 year tribal boys, and product moment correlation was calculated at 0.05 level of significance. There were significant relationship between BMI and WHR in 9 year tribal boys whereas, no significant relationship were obtained in 6yr, 7yr, and 8yr age group tribal boys.


Average body weight differences between urban and rural areas have been reported in many countries, but it is unknown whether these are due to effects of social selection or social causation. We examined whether adolescent body mass index (BMI) predicted selective urban/rural migration over a 21-year period and whether urban/rural living over the same period predicted differences in BMI increase from adolescence to adulthood in Finland. The participants were from the prospective, population-based Cardiovascular Risk...
in Young Finns study (n = 1787) aged 12–18 years at baseline and 33–39 years at the final follow-up, with data collected at six follow-up phases. Supporting social selection, heavier adolescents were less likely to migrate to urban areas as adults: in obese adolescents the likelihood of living in an urban area at 33–39 years age was one third of that in normal weight adolescents. Supporting social causation, rural residence over the study period predicted a greater increase in BMI from adolescence to adulthood than urban residence did. These associations were independent of parental socioeconomic status and BMI, and of participants’ own educational level, occupational class, marital status, and parenthood status. Together the findings suggest that the higher body weight of people living in rural areas of Finland may be due to both social selection and social causation mechanisms, i.e. heavier people tend to migrate to more rural areas where people tend to get heavier.

Koral, J. and Dosseville F. (2009) Combination of gradual and rapid body mass loss on the physical performance and psychological state of elite judo athletes

Subjects were divided into two groups: the experimental group needed to reduce body mass by 2-6%, whereas the control group did not need to lose body mass. Body mass, percentage of body fat, vertical jump, repetitions of judo movements, rowing with additional loads, and the Profile of Mood States were assessed at 4 weeks before a championship and again one day before the same championship. Compared with 4 weeks before the championship, the experimental group showed a significant decrease in body mass (-4 +/- 1.1%, P < 0.05), estimated body fat (-10 +/- 4.0%, P < 0.05), and judo movement repetitions over 30 s (-4.5 +/- 2.7, P < 0.05), and an increase in scores for confusion (-14.6 +/- 7.9, P < 0.05) and tension (-10.1 +/- 12.5, P < 0.05), but a decrease in vigour (11.3 +/- 8.5, P < 0.05), one day before the championship. There was no difference in squat jump or countermovement jump performance or in judo movement repetitions over. Results show that for the experimental
group some aspects of performance were impaired one day before a
competition, but performance of judo movements over 5 s was not affected.

**Takeshi Kukidome, Katsuyoshi Shirai, Junjiro Kubo, Yoshiko Nakashima**

Purpose of the study to check the Changes in body composition of college
wrestlers undergoing rapid weight reduction were evaluated over time using
magnetic resonance imaging (MRI). Investigator evaluated 12 wrestlers (male, 18-22 years of age) who participated in Japan's 2005 intercollegiate wrestling
tournament. For this study, MRI (of the right femoral region and the trunk), as
well as measurements of body weight, body fat percentage and body water
content, were performed one month and one week prior to the weigh-in, on the
day of the weigh-in, on the day of the match (after the match), and one week
after the weigh-in. A survey of food and fluid intake was also conducted.
Several variables were significantly lower on the day of the weigh-in than one
month prior: body weight (p<0.01,-7.3%); body fat (p<0.05); body water
content (p<0.01); trunk cross-section (p<0.05), including separate
measurements of trunk viscera, trunk muscle, and trunk fat; quadriceps muscle;
lower subcutaneous; and food intake (p<0.01). At one week after the match, all
metrics had recovered to their levels measured one month before the weigh-in.
Certain variables that were highly sensitive to hydration recovered more
rapidly: they had reached their initial levels when measured immediately after
the match. Rapid weight reduction reduced the wrestlers' cross-sectional areas
of muscle and fat tissues, which tended to recover through rehydration after the
weigh-in. These results suggest that rapid weight reduction of wrestlers
induced changes in different regions of the body.
Junjiro Kubo, Chishaki T, Nakamura N, Muramatsu T, Kukidome T (2006) Differences in fat-free mass and muscle thicknesses at various sites according to performance level among judo athletes

The purpose of this study was to investigate differences in fat-free mass and thicknesses of various muscles among judo athletes of different performance levels. The subjects were 69 male judo athletes of 3 different performance levels. Group A was composed of athletes who participated in the Olympic Games or Asian Games (n = 13). Groups B (n = 21) and C (n = 35) were composed of judo athletes at a university who did or did not participate in intercollegiate competitions (including qualifying matches), respectively. Muscle and fat thicknesses were measured by B-mode ultrasound at 9 sites. Fat percentage was calculated from fat thicknesses using a previously reported equation. Fat-free mass was calculated from fat percentage and body weight. Muscles thicknesses were normalized to the height of the individual. Group A had significantly larger fat-free mass than Group C (p < 0.05). The normalized thicknesses of the elbow extensor and flexor muscles were significantly larger in Group A than in Group C. The normalized thickness of the elbow flexor muscle was significantly larger in Group A than in Group B. The results of this study showed that judo athletes with low performance levels such as those in Group C had lower fat-free mass, and the degree of development of the brachialis muscles differed according to performance level.

Franchini E, M.Y. Takito, M.A.P.D.M. Kiss, S. Sterkowicz (2005) Physical fitness and anthropometrical differences between elite and non-elite judo players

The objective of this study was to verify the differences between Elite (Brazilian National and International medallists) and Non-elite (non medallists in Brazilian National Tournaments) junior and senior judo players. For this purpose, the following tests and measurements were conducted: (a) skinfold thickness; (b) circumferences; (c) breadths; (d) upper body Wingate test; (e)
Special Judo Fitness Test; (f) aerobic power and capacity; (h) Lactate after combat during active recovery (70% of velocity of anaerobic threshold) and passive recovery (rest); (i) Isometric hand grip strength. The groups were compared by means of an ANCOVA (covariates – age and weight) followed by a post-hoc Scheffe test (significance level=5%). Elite group presented better results than Non-elite group in the following variables (p<0.05): circumferences (cm) - flexed arm, forearm, wrist and calf; breadths (cm) – femur and humerus; Wingate Test – Mean and Peak power; Special Judo Fitness Test – number of throws and index. The other variables were not different between groups. It can be concluded that Elite judo players presented higher upper body and specific anaerobic power and capacity, higher circumferences (especially from upper body, indicating superior muscle mass in this area) and that skin fold, hand grip strength and aerobic power and capacity were similar in Elite and Non-elite judo players. Thus, these results suggest that training and talent identification of judo athletes should focus on the variables that were different between Elite and Non-elite athletes.

**Lindsted, Tonstad (1991) Body mass index and patterns of mortality among seventh-day Adventist men**

This study examines the relationship between body mass index (BMI) and 26-year mortality among 8828 non-smoking, nondrinking Seventh-day Adventist men, including 439 who were very lean (BMI <20 kg/m²). The adjusted relative risk comparing the lowest BMI quintile (<22.3) to the highest (>27.5kg/m²) was 0.70 (95 percent CI 0.63-0.78) for all cause mortality, 0.60 (95 percent CI 0.43-0.85) for cerebrovascular mortality, and 0.80 (95 percent CI 0.61-1.04) for cancer mortality. Very lean men did not show increased mortality. To assess whether the protective effect associated with low BMI is modified by increasing age, the product term between BMI and attained age (age at the end of follow-up or at death) was included as a time-dependent covariate. For ischemic heart disease mortality, age-specific estimates of the relative risk for the lowest quintile relative to the highest ranged from 0.32 (95
percent CI, 0.19-0.52) at age 50 to 0.71 (95 percent CI, 0.56-0.89) at age 90. Interaction was also seen for the next lowest quintile (22.4-24.2). There was a significant trend of increasing mortality with increasing BMI for all endpoints studied. For cancer and cerebrovascular mortality the P-values for trend were 0.0001 and 0.001 respectively. For the other endpoints the P-values were <0.0001. Thus, there was no evidence for a J-shaped relationship between BMI and mortality in males. While the protective effect associated with the lowest BMI quintile decreased with increasing age for ischemic heart disease mortality, it remained greater than one at all ages. The relatively large number of subjects who were lean by choice, rather than as a result of preclinical disease or smoking, may explain these findings.

Durnin, J. V. G. (1974) Body Fat Assessed From Total Body Density A. and And Its Estimation From Skinfold thickness Wormsley Measurements on 481 Men And Women Aged From 16 To 72 Years

Skinfold thicknesses at four sites - biceps, triceps, subscapular and supra-iliac – and total body density (by underwater weighing) were measured on 209 males and 272 females aged from 16 to 72 years. The fat content varied from 5 to 50 % of body-weight in the men and from 10 to 61 % in the women. When the results were plotted it was found necessary to use the logarithm of skinfold measurement in order to achieve a linear relationship with body density. Linear regression equations were calculated for the estimation of body density, and hence body fat, using single skinfolds and all possible sums of two or more skinfolds. Separate equations for the different age-groupings are given. A table is derived where percentage body fat can be read off corresponding to differing values for the total of the four standard skin folds. This table is subdivided for sex and for age. The possible reasons for the altered position of the regression lines with sex and age, and the validation of the use of body density measurements, are discussed.
3. STUDIES ON ADJUSTMENT


The aim of the study was to compare Social Adjustment between Physical Education and Non-physical. Sample: The subjects were fifty male school students of Srinagar (U.K.). Twenty-five subjects were physical education students and remaining twenty-five subjects were nonphysical education students. Social Adjustment of the subjects was gauged by using Social Assessment Index developed by Charles C. Cowell. t-test were applied to determine the significant difference on social adjustment between physical education students and non physical education students and the significant difference were found between them. In order to determine the significance of difference on social adjustment between physical education subjects and non physical education subjects. Within the limitations of the study, the physical education students were found having higher ratio of social Adjustment than non physical education students.


The aim of this study was to know about the role of emotional maturity and adjustment in performance of combat sport athletes. The investigator had selected Seventy Five (N=75) male Inter college level combat sport athletes of 19 to 25 years of age to act as subjects. To measure the level of emotional maturity among subjects, Emotional Maturity Scale constructed by Singh and Bhargava’s (1988) was administered. The level of Adjustment was measured by applying Adjustment Inventory prepared by A.K.P. Sinha & R.P. Singh (1980). One way Analysis of Variance (ANOVA) was employed to find out the
intra-group differences. Where F values were found significant LSD (Least Significant Difference) Post-hoc test was applied to find out the direction and degree of difference. For testing the hypotheses, the level of significance was set at 0.05. In a nutshell it can be said that from the findings that insignificant differences were found among combat sport athletes (Boxing, Judo and Wrestling) on the sub-variables of Emotional Maturity i.e., Emotional Instability, Emotional Regression, Social Maladjustment, Personality Disintegration, Lack of Independence and Emotional Maturity (Total). Significant differences were found among combat sport athletes (Boxing, Judo and Wrestling) on the sub-variables of Adjustment i.e., Social Adjustment, Emotional Adjustment and Total Adjustment. However, insignificant differences had been observed on the sub-variables; Home Adjustment, Health Adjustment and Educational Adjustment.


The objective of the study was to compare the social maturity of college non-sports women and sports women. The sample consisted of 100 female non-sports women and sports women in the age group of 18 to 24 years, representing different inter-college competitions in session 2007-08. The data obtained from the questionnaire used up by the subjects was subject to statistical analysis on computer. The values such as Mean, S.D and t-values were got worked out to find out the differences between the non-sports and sports women belonging to various government colleges of Chandigarh. Results depicts that the descriptive values such as Mean, SD and t-values were calculated regarding differences between non-sports women and sports women on all sub variables. The findings of the study shows the comparison of college sports women and college non-sports women did indicate that the Personal Adequacy, Inter-Personal Adequacy and Social Maturity aspect of the college
sports women was better developed than the college non-sports women. The comparison of college sports women and non sports women did indicate that social adequacy were no significant differences.

Khan Mahmood (2014) A Comparative Study of High and Low Achievers on Adjustment

The study was undertaken with the objectives to identify high and low achievers, and to study social, emotional, health, home, financial and total adjustment of high and low achievers. The mean of previous annual examination results of 7th and 8th class of 349 students was considered as a criterion for identification of high achievers and low achievers. Subjects whose mean academic achievement scores were at 75th percentile were considered as high achievers and below 25th percentile were considered as low achievers. For the measurement od Adjustment, Qadri’s (1964) Urdu Adoption of Bells Adjustment Inventory was employed, comprising of five factors A. Social, B. Emotional, C. Health, D. Home, and E. Financial. After the scoring of Adjustment Inventory was done, the data was subjected to statistical Analysis by employing “t” test in order to get understanding of Adjustment of both the groups. The findings revealed that the Low achievers posses more social, emotional, health, home and financial problems than high achievers.


The purpose of the study was to compare old aged males and females on Adjustment and Self- concept questionnaire given by Saraswat, 1984. The study was conducted upon 100 old aged persons both 50 male and 50 female. For the selection of the sample normal random procedure was adopted. The age range of the subjects was from 60 years and above. The investigator collected the response of all the subjects and scoring was done according to the instructions given in the manual. Bell adjustment inventory was employed,
Review of the Related Literature

Consisting of 160 items, has five separate measures of personal and social adjustment viz. home, health, social, emotional and occupational adjustment. The result reveals that the calculated t-value in all the areas of adjustment health, home, social adjustment is significant at 0.001 levels, which shows that there is significant difference in male and female aged sample in adjustment. Men are better adjusted than women. The result of present study revealed that significant difference was found among the groups on home, health, emotional and social adjustment area as well as self – concept scores.


The aim of the investigation was to compare and study Adjustment of Male and Female secondary teachers and to compare male and Female secondary school teachers on various dimensions of adjustment, conducted upon 60 teachers of different secondary schools of Zone Hajinin district of Bandipora Kashmir. For the selection of the sample normal random procedure was adopted. The age Ranges from 30-50 years. The investigator collected the data and scoring was done according to the instructions given in the manual. The results indicate as follows: 1) Female teachers have more home problems than male. 2) Female Teachers have more health problems. 3) Male school teachers have more social problems than females. 4) Female teachers have more emotional problems than male teachers. 5) Both Male and Female teachers have similar occupational problems.

Sushma Rani & Mahesh Kumar (2013) A Comparative study of physical fitness abilities and adjustment level among elite and non-elite female judokas

Aim of study was to find out physical fitness and adjustment level among elite and non-elite woman judo player who performed at various levels of competitions. A sample 180 Elite and non-Elite judo woman player was
selected and further divided in three groups i.e. District, State and National level performers. Physical Fitness and Adjustment of all the three groups were measured by applying standardized tools and tests. Raw score was arranging, tabulated and t value was applied for significance of results. Significant differences were found in physical fitness and adjustment level of National level women judo player in comparison to state district woman judo players. Physical fitness and adjustment level among state level and district level women judo player was also found with significant differences. In conclusion significant at 0.01 level of significance were found on physical fitness and adjustment level of elite non elite players.


A three step search method was adopted to identify studies that used measures of physical activity or fitness to assess either degree of association with or effect on academic achievement and cognitive performance. A total of 18 studies including one randomized control trial, six quasi-experimental and 11 co relational studies were included for data extraction. No studies meeting criteria that examined the links between physical activity and cognitive function were found. Weak positive associations were found between both physical activity and fitness and academic achievement and fitness and elements of cognitive function, but this was not supported by intervention studies. There is insufficient evidence to conclude that additional physical education time increases academic achievement; however there is no evidence that it is detrimental. The quality and depth of the evidence base is limited. Further research with rigour beyond co relational studies is essential.

The paper focuses attention on attributes of the external environment and the capacities of living organisms to adjust to them. Environmental management involves ‘trade-offs’ between the biological limits within which man can adjust to changes in his ecosystem and the social cost-benefits which he perceives as contributing to the quality of his life. Psychobiological mechanisms involved in the plasticity of behavior during acute and chronic exposures to such changes are analyzed and the limits they set on adjustment, discussed. Examples are given of research designed to study both the plasticity and the limits based upon the strategies of environmental epidemiology, clinical investigation, and experimental psychobiology.

Warbah L, Sathiyaseelan (2006) Psychological distress, personality, and adjustment among nursing students

This study used a cross-sectional survey design to study psychological distress, personality and adjustment among nursing students attending the College of Nursing, Christian Medical College, Vellore, India. One hundred and forty five nursing students were assessed using the General Health Questionnaire 12, the Eysenck Personality Questionnaire, and the Bell’s Adjustment Inventory to investigate psychological distress, personality profile and adjustment, respectively. Thirty participants (20.7%) of the 145 students assessed reported high scores on the General Health Questionnaire. Psychological distress was significantly associated with having neurotic personality and adjustment difficulties in different areas of functioning.

Goutam Ritu (2000) Critical study on Physical Fitness, Attitude and Adjustment Among the College level Students

The purpose of the investigation was to ginned - out the physical fitness, attitude towards physical activity and adjustment among the college level
female students. 100 female students of Delhi University with the large ranged between 17 to 20 years were randomly selected. AAHPER Youth Fitness Test, Bell Adjustment Inventory and Bhullar’s Attitude Test were used. The results of the study indicated that the female students of Delhi University were found significantly better in physical fitness than the rural areas. The attitude towards physical activity and sub-dimensions was found significantly higher in urban area students than in rural areas. Similarly, the urban area female students were found better adjusted than rural area female students.


The purpose of this study was to find out adjustments and physical fitness levels among the intercollegiate Hockey, Volleyball and Basketball women players of Kurukshetra University. Random sample of 90 subjects, 30 each sorts, was taken for this study. Bell’s adjustment inventory and pre-tested physical fitness variables were administered to find out the various adjustment and physical fitness levels among the different women sports groups. Significant difference at 0.1 was found in 50 meter run and standing broad jump in favour of Hockey and Basketball groups, situps and trunk flexibility in favour of Hockey group. Significant difference at 0.5 level was also found in favour of Volleyball group. It is concluded that Hockey players were more superior in speed, abdominal strength, trunk flexibility and cardio-vascular endurance than the players of the other two groups. Volley ball players were better in leg strength as compared to those of the other two groups. Similarly Basketball players were superior in Shoulder strength and agility than then players of the other two groups.
Kumar Rajeev (1999) The study of relationship between academic achievement and physical fitness among senior secondary male students of West Delhi schools

The study was conducted in order to investigate the relationship between academic achievement and physical fitness among senior secondary male students of West Delhi schools. The subjects were randomly selected from the various govt. schools of west Delhi, running under Directorate of Education Govt. of National Capital Territory of Delhi. Total 100 subjects were selected randomly from class eleventh and their age was ranging from 15-17 years. The AAHPERD Youth fitness Test Battery was employed to record the performance of each fitness component. The data for their academic achievement was collected from the school record. The Z-score and Pearson’s Product Moment Correlation Method were applied. As per the result, the relationship between academic achievement and physical fitness was found significant. The calculated value was .23, which was significant against the tabulated value of .19 for 98 degree freedom at 0.05 level of significance.

Gupta Shiv Narain (1993) Investigation in to the needs Interests and Adjustment Problems of outstanding Sports persons

The purpose of the study was to investigate on needs, interests, and adjustment problems of the sports persons and non-sports persons. The study was conducted through reliable and validated inventoried, prepared by researcher. The content validity method on 3 point scale was used. The correlation between and among the needs, interest and adjustment problem justified. Descriptive statistical techniques were used for the rating of outstanding sports persons. For comparing the outstanding sports persons OSPER and non- sports persons NOSPER inferential statistical techniques were used. The result of the study were concluded as: 1) OSPER groups differ significantly from the NOSPER groups in needs for adventure, independence, self- actualization,
aesthetic, sports and games, mechanical, outdoor and social interest areas and 3) the adjustment problems of the OSPER group and NOSPER group differ significantly, the difference found positive in all except heath adjustment problems area.

**Bhullar (1982) A comparative study of attitude towards physical activity of University male and female students**

The purpose of this evaluation was to discover the structure of attitude towards physical activity of male and female students living in the same environment. Subjects for this study included both male and female students. The 200 (100 male & 100 female) subjects who participate were drawn randomly from various teaching departments of the Punjab University campus, Chandigarh. Their age ranged from 16 to 23 years. 16 to 23 years. To measure attitudes, physical activity attitude scale constructed and standardized by the author was used which consisted of 70 items. Scoring was done on the basis of ‘Scale Product Technique by giving weight for each response category in the Likert fashion and then multiplying the same with scale value of the statement.

**Lambert, M. (1981) A Comparison of Student Attitudes in Traditional and Selective Physical Education Programs**

Attitude toward Physical Activity (ATPA) scale was administered to 390 sophomore students in a selective physical education programme and 368 freshman students in a traditional physical programme in Winona MN. Data were treated by ‘t’ and MANOVA to determine differences between grades, sex, and 69 area of residence and level of athletic participation. The There were no differences in attitudes between 9th and 10th grade students, i.e. the two types of programs. 10th grade males had more positive attitudes than 10th grade females in the sub domain of pursuit of vertigo while females had most positive attitudes in the sub domain of physical activity as an aesthetic and social experience. There were no differences in attitudes between rural and
suburban students. 10th grade athletes had more positive attitudes towards physical activity and sub domains of health and fitness, catharsis and ascetic experience than 10\textsuperscript{th} grade non-athlete.

Mary L. (1970) \textit{Personal-Social Adjustment, Physical Fitness, Young Attitude toward Physical Education of High School Girls by Socioeconomic Level}

Tested Eleventh grade girls (N = 114) representing three socioeconomic groups to determine whether there are any significant differences between socioeconomic groups with reference to personal-social adjustment, attitude toward physical education, and physical fitness. These variables were measured by the California Test of Personality — Secondary Form AA, the Wear Attitude Inventory — Form A, and the AAHPER Youth Fitness Test. Socioeconomic level was determined using McCall’s Scale. Relationships between these variables for the entire group and for each socioeconomic group were investigated. Results showed a significant difference between socioeconomic groups in the matter of personal-social adjustment, with the high socioeconomic group showing better adjustment scores than the middle group and the middle group better than the low group. There were also significant positive relationships between the following variables: physical fitness and attitude toward physical education, physical fitness and personal adjustment, and attitude toward physical education and personal-social adjustment. These relationships, at times, differ according to socioeconomic level.
4. STUDIES ON PERSONALITY TRAITS

Kenneth (2013) Relationship between Physical Fitness and Selected Personality Traits
In the first phase of this study, 386 high school junior and senior boys were administered a Physical fitness test. The boys who finished in the upper 15 percent on the test were compared, by use of a battery of three personality tests, with the boys who were in the lower 15 per cent. Significant personality differences were found. In the second phase of the study, the low Physical fitness group was divided into a control and an experimental group. A 9-month physical fitness program for the experimental group resulted in a significant gain in physical fitness. When compared with the control group changes during the experimental period, the experimental group personality trait changes were found to be significantly different on only one test item.

This study used ecological momentary assessment (EMA) to determine where and with whom children's sedentary behaviour occurs during their nonschool time. Children (N = 120) ages 9-13 years (51% male, 33% Hispanic) wore mobile phones that prompted surveys (20 total) for 4 days. Surveys measured current activity (e.g., exercise, watching TV), physical location (e.g., home, outdoors), and social company (e.g., family, friends). Children engaged in a greater percentage of leisure-oriented (e.g., watching TV) than productive (e.g., reading, doing homework) sedentary behavior (70% vs 30%, respectively). Most of children's sedentary activity occurred at home (85%). Children's sedentary activity took place most often with family members (58%). Differences in physical context of sedentary behaviour were found for older vs.
younger children (P < .05). Type of sedentary behaviour differed by gender, racial/ethnic group, and social context (P < .05). Children may prefer or have greater opportunities to be sedentary in some contexts than others. Research demonstrates the potential for using EMA to capture real-time information about children's sedentary behaviour during their nonschool time.


Study purposes were to examine sex differences across leisure-time exercise behavior, motivation, and primary exercise dependence symptoms in youth and the extent to which exercise behavior and motivation predicted exercise dependence within the Self-Determination Theory framework. Adolescents (N = 805; mean age = 15 years; 46% girls) completed measures of exercise behaviour, motivation, and exercise dependence in health/PE classes. One-way ANOVA revealed boys scored higher than girls on leisure-time exercise behaviour, exercise dependence symptoms, and most of the exercise motivation subscales. Hierarchical regression analyses indicated a) sex, exercise behaviour, motivation, and their interaction terms explained 39% of the variance in primary exercise dependence; b) Integrated Regulation and Interjected Regulation were important determinants of exercise dependence; and c) sex moderated the contributions of External Regulation for predicting exercise dependence such that boys in the high and low external regulation groups had higher symptoms than girls in the high and low external regulation groups. These preliminary findings support the controlled dimensions of Integrated Regulation (boys, girls), Interjected Regulation (boys, girls), and External Regulation (boys only) are important determinants of primary exercise dependence symptoms.
Marja Ilona Kinnunen, (2012) Self-Control is Associated with Physical Activity and Fitness among Young Males

The personality trait self-control has been associated with various adaptive outcomes. The objective of this cross-sectional study was to explore whether self-control is associated with self-reported leisure time physical activity (LTPA), Body Mass Index (BMI), muscle- and fitness aerobic fitness among young men. Participants (482 male conscripts; age M = 20) completed a questionnaire and participated in anthropometric measurements in the DefenceNutri Study, and took standard aerobic fitness and muscle fitness tests as part of their military training. Self-control was found to have a positive association with LTPA, aerobic fitness, and muscle fitness, and a negative association with BMI. Self-control predicted aerobic and muscular fitness regardless of BMI, and remained a significant and independent predictor of aerobic fitness but not muscle fitness, when LTPA and BMI were controlled for.


The study was conducted from Kanpur University that personality is the relatively stable and distinctive patterns of behaviour that characterize an individual and his or her reactions to the environment. In recent years the study of her personality of sports men and women dot great relevance, as it affects the success and moulding of behaviour. Trait theories assume that a personality can be described by its position on a number of continuous dimensions or scales, each of which represents a trail. A trial refers to any characteristics in which one individual differs from another in a relatively permanent or consistent way. Research into the relationship between personality and sports is principally educated towards answering two categories of questions. 1) The influence of sports on personality, 2) To predict individual difference in sports
participation and achievement. The study has been conducted to find out the relationship between personality trails of selected sports groups.

Singh Matharu (2000) A comparative study on Selected Physiological Parameters and Physical Fitness Components Among Sprinters and Football Players from Delhi University

The study was designed to compare the physical fitness and physiological variables between football players and sprinters of intercollegiate from Delhi University. The subjects were randomly selected for each group of football players and sprinters (shot distance runners). The physical fitness status was measured through ‘AAPHERD Youth Physical fitness Battery’ were the test items were: Pull-Ups, Bent knee sit-ups, Standing broad jump, Shuttle run, 50 Yards dash and 12 minutes Run/walk and the physiological parameters were: Blood pressure (systolic), Blood pressure (diastolic), Pulse rate, respiratory rate and Breath holding. The data was compared with the help of Mean, Standard deviation and ‘t’ test for physical fitness and physiological variables. The significant difference through ‘t’ test for physical fitness among football players and sprinters were found with the values as: Pull-Ups (2.07), Bent knee sit-ups (2.12), shuttle Run (2.30), Standing broad jump (2.10), 50 Yard Dash (5.73), and 12 minutes run/walk (2.65), against the tabulated significant value of t.05 (29) = 2.04 at .05 level of confidence. The ‘t’ test values of physiological variables were found insignificant difference among football players and sprinters. The calculated ‘t’ values were : Blood Pressure systolic (1.05), Blood Pressure diastolic (1.53), Respiratory rate (0.99) and Breath holding (0.49) against the tabulated significant value at t.05 (29)= 2.04 at .05 level of confidence, The results were also explained with an observation that the status of the sprinters was better with regard to physical fitness and physiological tests except in blood pressure (systolic).
Sandhu, Kiran (1988) A comparative study of sports women and non-sports women in selected psychological and sociological variables

The objective of the study was to study the personality factors of sportswomen and non-sports women, to compare the personality factors of sportswomen and non-sportswomen, to study and compare the socio-economic status of sportswomen and non-sportswomen, to find out the dominant personality factor among women participants in sports, and to study the influence of socioeconomic status on the sports women in their choice of sports. Then sample consisted of 200 sportswomen and 200 non-sports women, randomly drawn from various colleges of Delhi during academic sessions 1984-85 and 1985-86. The tools used to collect the data included 16 PF Questionnaires by Cattell to measure personality factors and socio-economic status scale. The collected data were treated by using mean and ‘t’ test. The major findings were 1) the sportswomen (SW) were found to more tough mined and group-dependent and less submissive, shy and sober as compared to non-sportswomen (NSW), 2) Both groups were found to be reserved, less intelligent, emotionally less stable, conscientious, suspicious, practical, shrewd, self-assured and experimenting, uncontrolled as well as relaxed, 3) in team games, SW differed significantly from NSW, in individual games, SW differed significantly from NSW on factors B,O,Q1 and Q4, 4) No significant differences were found between the two groups on factors A,C,F,G,H,N and Q2Q4. 5) Non-sports women scored higher on all the factors of socio-economic background than of the sportswomen. 6) Representation in team games by SW was in a significantly low proportion from the upper middle class and in a high proportion from the lower class as compared to the individual games.
AN OVERVIEW

The review of the studies mentioned in the chapter II led to the following conclusions.

That sports participation has a great influence on almost all the aspects of students’ personality. So far as studies in India is concerned, a few well known foreign tools such as, Bell’s Adjustment Inventory, Ravens’ Advanced Progressive Matrices, Cattle’s Personality Questionnaires, Emotional Maturity Scale constructed by Singh and Bhargava’s (1988 etc continue to be used, which is encouraging that Researchers have employed the tools developed by Indian or foreign Psychologists and Educators to study the impact of sports participation on different factors of Adjustment.

The trend emerges out of the related literature is that few studies have been carried out on Physical fitness of Sports and Non-sports Persons on different variables such as Body Mass Index, Body Fat percentage, Physical fitness components such as Strength, Speed, agility, Endurance, balance, power, flexibility etc. As for as Adjustment of Sports and Non-sports Persons is concerned, a few studies have also been conducted on variables Physical Fitness abilities & Adjustment, Adjustment of High and Low Achievers, Personal-Social Adjustment, Attitude toward Physical Education, self concept, academic achievement, Cognitive development, Behavioural Adjustment & Attitude towards physical activity and Physical & Social contexts of children's nonschool sedentary behaviour etc.

Overview of researches conducted during the last few decades indicate that certain personality aspects such as Adjustment of Sports and Non sports Persons have not been extensively investigated. Rapidly changing scenario pertaining to the changes in rules, equipments and infrastructure have immensely influenced the performance of sports performance. Very few studies have been conducted on Physical fitness and Adjustment at National and International level, and no such study has been conducted in Jammu and Kashmir till date.