CHAPTER – II

REVIEW OF RELATED LITERATURE

Pursuit of knowledge is innately, instinctively and intellectually inherent in human nature. He continues to learn from birth till death, from his own as well as other’s experiences.

Review of related literature is an important pre-requisite for actual, planning and execution of any research work. The research could locate certain studies which were found closely related to the present study. But it is to be noted that the reference made to those studies in the research abstracts were not adequate enough to pursue on in depth analysis of the studies. It avoids the risk of duplication, provides ideas and explanation of theories and in thus valuable in formulating the hypotheses.

In this chapter an attempt has been made to take Cognizance of studies which have relevance to the present problem.

A review of research report to relate to the present study that the research scholar could gather in presented in this chapter in order to provide the background material to evaluate the significance of this study as well as to interpret its results.

Boon (1967) purpose of the study was to find out fitness level of urban and rural boys. (N=100) each urban and rural boys were administered AAHPER Youth Fitness test. The result of the study showed that urban boys were superior to rural boys and difference between the two was significant at .05 level of confidence. It was further concluded, that two samples were weaker in the same components of the physical fitness.

Meyer (1968) constructed a battery of motor ability measures for boys girls, ages six through twelve. The proposed battery included a measure of height,
weight, age and forty-two Motor performance variables. Statistical treatment of the data included: 1. the inter correlation matrix was factor analyzed by the principle axis method. 2. A promax rotation was applied to the factor matrix: 3. A second order analysis was performed.

Foley (1970) took up the study to determining whether changes has taken place over a period of thirty three years in the motor ability of boys, age ten to fourteen years from 1934 to 1937 involving the factors of age, height and weight. Motor ability of ten to fourteen years old boys was tested using a ten items test which when compared to the thirty-three item test of Nelson and Cozens showed correlation of 0.916. The testing sample consisted of 3,249 boys from new Hampshire and Massachusetts. The performance levels of Massachusetts and now Hampshire boys in 1967 provide inferior to the Nelson-Cozens results of 1984 also the city boys states in 1967 performed slightly better then their rural peers. The results of this study also indicated that the value of age, height, and weight as a corporate classification index was open to question.

Davis (1970), identified the physical fitness level and socio-economic level of children and determined their relationship. He also found factors of each socio-economic level and physical fitness level contributing to the child's physical fitness. He concluded that social level did not contribute to the total physical fitness.

An investigation was made by Dahl (1971) to determine the possible differences between Negro and white boys on measures of physical fitness. The three sup-tests, sit-ups, standing broad jump and soft-ball throw of AAHPER Youth Fitness Test was used. The sample consisted of 100 Negro and 100 white, fifth and six grade boys and 100 Negro and 100 white ninth and tenth grade boys, from the same district, ‘t’ test was employed to test the difference. Negro boys scored significantly higher than white boys on overall physical fitness at both levels.
Miller (1971) made an investigation to determine the value of 300-yard run as a measure of endurance. The effects of administering the test on a short, tight course on the quarter mile running track were also studied. The validity of 300-yard run test was established by correlating the results of two tests with 12 minute run-walk test and Harvard Step-test. The circumference and the surface of the test administration sites used in this study had no significant influence on the value of 300-yard run as endurance test.

A study was undertaken by Dowell and Landiss (1971) to determine the physical fitness trends of entering college freshmen. Entering male fresh students were tested on the Texas A & M Physical Fitness Test, The test included pull-ups, sit-ups and 300-yard shuttle-run. A total of 5,496 subjects were used in this 20 year study. ANOVA between year's was computed for each physical fitness item. It was concluded that muscular endurance as measured by sit-ups had improved over the past 20 years. Arm strength increased from 1948 till about 1963, and since then it decreased. No definite trend was seen concerning the running speed and agility.

Ralph (1971) conducted a study to compare physical fitness of Negro White boys of Texas school (N=200). each were subject of the study and were administered AAHPER Youth Fitness Test. It was revealed through analysis of data that Negro boys obtained higher mean scores than Negro boys on gross body co-ordination (softball throw) and difference was significant at 0.05 level. Further, Negro boys were higher than White boys in muscular explosive (standing broad jump) and difference was statistically significant at 0.01 levels.

Me Kinney (1972) constructed motor fitness test battery for undergraduate male physical education majors. Forty nine test items were selected as valid measures of the eight motor fitness components and were administered to 121 undergraduate males. The data were analyzed according to the principle axes method with varimax criterion for rotation. Five factors were isolated and named, speed endurance, gross strength, power agility, flexibility and relative muscular
strength, muscular endurance. Two test batteries having five items each were developed on the basis of the rotated factor loading. Test battery I contained highest loading test items: (1) time limit shuttle run (2) cable tension (3) 10-yard dash. (4) thigh flexion flexibility (5) bar push ups.

Cobb (1972) constructed a scientifically designed evaluative instrument for assessing the motor fitness of first, second and third grade girls. Thirty test items selected through a pilot investigation, were administered to the 183 subjects. Pearson Product Moment Raw Score Formula, the Zero Order Correlation Coefficient were used to construct correlation Matrix for the factor analysis of the data using the Principal axes method. The battery of the seven most valued measures which loaded highest on each factor was developed and included Clark’s strength composite, Mc-cloy endurance ratio, leg extension and flexion, Well’s sit and reach, dodging run, Bass Lengthwise stick balance, and vertical jump.

Elmer Villiam Yoest (1973) conducted a study on the relationship between cardiovascular fitness and related body measurements of 51 grade eight boys and 43 college male subjects who were selected from physical education classes. The measurements determining each group were age, weight; height; skinfold at the triceps, mi-axillary and nipple area; body density; present body fat; lean body mass and body surface area. A cardiovascular step test was administered to both groups to determine cardiovascular fitness. The Ohio State University test was administered to the college men and a modified version of the same test was used for the younger subjects. Pearson’s Product Moment Correlations were used to determine the relationship between the body measurement performance on the step test. The factors of age, height, lean body mass and body surface area did not significantly limit the college men’s step test performance, but it did effect the 13 to 15 years old boys. The study suggests that the subjects, adolescents or adults who possessed high percentage of lean body tissues registered higher score on the step test.
Remi (1974) put forward factor analysis of physical fitness in 11 and 12 years old elementary school boys enrolled in the Springfield School system, Ohio, 1973. Twenty four physical fitness evaluation items were selected based on their relationship to one or more physical fitness components. The test items were: cardio-respiratory, efficiency, strength, muscular endurance, flexibility, and body fat. The findings clearly indicated a well defined factor structure of physical fitness for elementary school boys. The factor structure was almost similar for both the age groups and was also similar to adult physical fitness components. Tests were more specific at ages seven and eight years as they were loaded on only one factor. This confirmed the belief that physical fitness tests were not necessarily specific to one factor.

Willee (1976) attended the Clarice symposium in June, 1976 and presented a paper entitled, "Fitness Australia?" This paper showed the results of a fitness survey of Australian boys and girls, 13 to 17 years of age in Government (Public) Schools by the use of AAHPER Youth Fitness Test. This survey was compared with a similar study in the United States by Hunsticker and Reiff in 1958 and 1965. According to the U.S. data of 1958 the Australian girls were superior in circulatory endurance, leg power speed, agility, and abdominal endurance, but weak in the arm and the shoulder girdle. U.S. data of 1965 revealed that the Australian girls were markedly inferior in the arms and the shoulder strength, static muscular endurance, leg power, abdominal endurance, and agility. One area in which Australian girls showed superiority was circulatory endurance (600 yards run walk). U.S. data of 1958 showed that Australian boys were almost equal in pull-ups and sit-ups and superior in all other tests except for the softball throw for distance.

Andrews (1976) undertook a study to establish physical fitness norms for South African boys and to compare their physical fitness level with those of Canadian boys. AAHPER physical fitness Battery (1966) consisting of one minute speed sit-ups, the standing broad jump, the shuttle run, flexed arm hang, 50 yard run.
dash and 300-yard run were administered. A t-test was applied to compare the mean scores of the South African and Canadian students. The results were found to be significantly in favour of the South African boys. Zuti and Corbin (1977) established physical fitness norms for college freshmen. They took 3,000 freshmen of Kansas State University from the age of 17.6 to 19.5 years. The tests were conducted for strength, flexibility, body composition and cardiovascular fitness. The results appeared to indicate that college freshmen at Kansas State University were of a standard similar to the average American.

Anyanwu, Samuel Uwazuruonye (1977) attempted to establish physical fitness norms for Nigerian boys and girls in the age group 11 years to 18 years. The study included the following test items: Shuttle run, push-ups for boys, Chair-push-ups for girls; flexed knee sit-ups; 45 meter dash, standing long jump, pull-ups for boys, flexed arm hang for girls, a minute run for subjects 11 to 12 years; and 12 minute run for subjects 13 to 18 years. The results of the study show (1) "the high correlations were obtained on the test-retest method. The test items were considered objective. (2) The activities can be accepted as true test items for the components of physical fitness which they purport to measure. (3) In most of the test items the performance of the boys improved from the lower to upper age levels. (4) The boys performed better than the girls in all the test activities. (5) The mean scores revealed that the girls of lower age level tend to possess better physical fitness status than the girls of the upper levels.

Borg (1977) compared the strength and endurance capacity between American and Swedish male athletes. Intermittent work capacity was assessed by the cycling strength and endurance test on a specially constructed bicycle ergometer. The CSET proved highly reliable for the American sample. The validity of CSET measurements as predictors of continuous physical working capacity, seems quite adequate. The maximal strength components of the CSST correlated to a fairly high degree with the maximal work rate on the bicycle ergometer test.
Zuti and Corbin (1977), established a physical fitness norms for college freshman. They took 3000 freshman of Konas state university from the age of 17.6 to 19.5 years. The tests were conducted for strength, flexibility, body composition and cardio-vascular fitness. The results appeared to indicate that college freshman at Konas state university were of standard similar to the average American.

M. Robson, A.R. Uppal (1978) undertook a comparative study on 150 boys and girls belonging to both defence and non-defence personnel in the correct perspective. The test battery composed of six items (Viz. : 50 dash, 4x10 mts shuttle run, sit-ups, modified push ups, vertical jump, 600 m. run and walk) was administered to both boys and girls. In conclusion they found that Elementary school girls and boys studying in graces one to five, and belonging to defence personnel performed significantly better in physical fitness as compared to girls and boys belonging to non-defence personnel.

Juteja (1978) Administered the AAHPER youth fitness test and the National physical efficiency drive test to 100 rural and 100 urban male school students in Delhi. The subjects ranged from 14 to 17 years of age. He concluded that the means score on the AAHER youth fitness test were slightly higher in the case of urban high school students when compared to those of rural high school students. The mean scores of rural high school students were slightly higher than those of urban high school students in the national physical efficiency drive test. However, none of the differences in the mean scores was found statistically significant of the 0.05 level of confidence.

Watson (1978), conducted a study to construct norms for Nebraska boys and girls. The test items for the Neb ELE physical fitness test were Standing Broad Jump, or Vertical Jump, 50-Yard Dash. Sit Up, Stick Jump and 300-Yard Distance Run. The items for secondary test were Pull Up, or Flex Arm Hang, 50-Yard, Dash, Standing Long Jump, Sit Up, Side Step, and 1 Mile or 9- Minute or 12" Minute Run. A random sample of schools in Neb. (1%) was selected to participate in the establishment of those norms. The norms were established for
each test items for girls, boys and the groups according to the chronological age.

Mookerjee (1978), made a comparative study of physical fitness of young boys in the age groups of 13-17 year belonging to rural and urban and also less active boys of the same group. The result of this study was that there was no doubt that regular physical activity contributed significantly to the enhancement of physical status. Physical fitness of rural active subjects were definitely of superior level than the boys living in the city. Pure food, fresh and unpolluted air and reasonable regular physical hardship were chief contributory factors in promoting physical fitness.

Ray (1979), in his study compared physical fitness of urban and tribal students of Agatala. The study consists of (N=60) each urban and rural students studying at M.B.B.S. College. The subjects were tested on AAHPER Youth Fitness Test. The age of the subject ranged between 16-20 years. The menu difference between two was not found significant at 0.05 level. It was found that urban students were better in pull-ups, and son-ball throw for distance and their superiority was statistically significant at 0.05 level. But in remaining five test items, that is, 50-meter dash, 600-meter run/walk sit ups, shuttle run and standing broad jump, the difference in performance of neither of the group was found statistically significant.

Goslin and Stephen (1980) conducted physical fitness field test battery on 98 white coloured and 32 black senior high school pupils. White subjects scored higher on tests of aerobic and on-aerobic power, and speed sit-ups. Black subjects, were stronger than the other two groups. There was no difference between the subject groups on tests of balance, upper body endurance, agility or flexibility. Male results were higher then female results in all tests except flexibility where the trend was reversed. It was felt that social and economic factors, and the intensity of habitual physical activity played a significant role in the results of this study.
Dass, Tapan Kumar (1980) prepared physical fitness norms for ninth to eleventh classes of schools of Delhi Administration. In each school, ten percent of the students were tested on the items of American Alliance of Health, Physical Education and Recreation (AAHPER) Youth Fitness Test and National Physical Efficiency Drive (N.P.E.D) Battery 'A'. The items in the N-P.E.D. battery were the same as included in the syllabus of Central Board of Secondary Education. Percentile norms were prepared and were statistically analyzed. It was concluded that the abdominal strength of Indian students seems to be very poor as compared to that of American students. The performance of students of class IX was very poor in all items of fitness tests and there was a remarkable spurt of performance in classes X and XI, though, still lower than that of the students studying in America, except in pull-ups for measuring shoulder girdle strength.

Saha (1980) conducted a study on selected Anthropometric measurements and physical fitness variables of tribal and non-tribal students of Tripura. AAPHER fitness test was used. The study did not show any significant difference between physical fitness of tribal and non-tribal school students. In a similar study Mehta (1981) compared physical fitness of tribal and non-tribal school girls of Indore Division. She also used six physical fitness tests (AAPHER Physical Fitness test). The results showed that tribal girls were better in arm strength, abdominal strength and agility. Non-tribal girls were better in explosive strength and endurance.

Shirda (1981) compared the physical fitness level of Iraqi children with AAHPER Youth Fitness Test norms. Data was collected by administering the Youth Physical, Fitness Test to 545 children between 10-17 years of age in Basrah. The findings revealed that the performance of Iraqi children in Basrah in an absolute sense exceeded the American norms by 15 items. At an early age (10-12) performances of both boys and girls of both the countries were similar.

Sittman (1981), developed norms for 372 males and 648 females students enrolled in the health and physical fitness concept classes of north east Missouri
State University. The subjects were tested for the sum of 6 skin folds, predicted 1% fat, Predicted vol.2 max-grip strength, leg strength, back strength, Vertical jump for Distance and Vertical Jump for Power. Mean, standard deviation; and range for all variables were recalculated. Percentiles in increments of five were constructed for each variable in each classification.

Pizarro (1982) investigated the use of the Health Related Physical Fitness tests and the modified pull-up with mainstreamed EMR/TMB children to normal children was a secondary aspect of the study. Modified sit-ups, sit and reach, skinfold fat measurement and modified pull-ups were found to be reliable and suitable for use with mainstreamed EMR/TMR. children. The 880 yard run was inappropriate for TMR’s and acceptable for EMR's provided they were adequately prepared before hand. Comparison between sexes indicated that fitness trends in-retarded populations are similar to normal populations. Males demonstrated much more strength, and better cardiorespiratory endurance than females. Females were significantly more flexible than males and tended to have greater amounts of body fat.

Walker (1982) conducted study, on white and black female students at northern high school. 50 white female 10 grade students-were randomly selected as the subjects. AAHPER Youth Fitness test was administered on item. Statistically analysed, it was concluded that the black' subject scored significance higher (p .05) than the white subjects on leg power, (M = 44.6% and 31.2%) and M- 57.8% and 39.1% respectively. The white subjects performed significance higher than black subjects on abdominal strength (M=31.5% and 24.7%). No other comparisons were significant.

Sandhu (1983), investigated differences if any, in rural and urban dents of district of Amritsar. (N = 50) each from urban and rural subjects were administered N.P. Ed. physical performance test. Statistical significance was found in rural and urban students when 't' test was employed. Further, the study revealed that rural area students were more fit than urban area students of Amritsar.
Maity (1983), made a comparative study of physiological and physical fitness variables between tribal and non-tribal high school students of Murakatha Nehru Vidya Bhawan in Midrapur district of West Bengal. The subjects chosen for the study were between the age of 14-17 years. It was observed that the tribal students were significantly superior in peak respiratory flow rate, speed, endurance and anaerobic power.

Kaung Sukkasem (1983), study measured and compared height, weight, residual, skin-fold thickness, % of body fat, strength, flexibility and reaction time and the resting electrocardiogram of 80 Oklahoma State University male students between 20-30 years of age from middle-east.

Humphrey (1983). investigated the physical fitness level of third grade pupils taught by specialist and non-specialists. One hundred specialists and hundred non-specialists were randomly selected from twenty schools in Greenly, Calorado. The AAHPER youth fitness test was administered, the tests consisted of the items Sit Up, Sit and Reach, Skin-fold measurement, a Mile Run/Walk. The 't' test was used to compare the group i.e. subjects taught by specialists and those taught by non-specialists. The result indicated that specialist group had significantly higher score on the non-specialists of the twelve tested components. The specialists males scored significantly higher on the Sit Up, Sit and Reach, Skin-fold measurement and One Mile Run/Walk than non-specialists male. The specialists female scored significantly higher in the Skin-fold measurement, than the non-specialists females.

Gurumal (1984) also constructed norms in selected physical fitness test items for secondary school girls in Madras city. Ten girls each from ten randomly selected schools were taken as subjects and tested on the selected physical fitness test items, consisting of sit-ups, vertical jumps, flexed arm hang, 4x10 metre shuttle run, 50 metre dash, and 600 metre run/walk. The Percentile Scale was computed on combined sample of the girl students. It was concluded that performance of the girl students was very poor in the selected test items.
Veera Swamy (1984) conducted a study of youth physical fitness for the boys of Gwalior. AAHPER Youth Fitness Test was used on 212 subjects, randomly selected from different schools of Gwalior. She found that physical fitness was related to the degree of regularity in physical activities and was independent of the economic status of the subjects.

Robbins (1985) conducted a study to develop percentile norms for Alabama students in grades 1 to 9 based on their performances on both the AAHPER Youth Fitness Test (YFT) and AAHPER Health Related Fitness Test (HRFT). The two tests were administered to 2,545 Alabama boys and girls of the age group 6 to 4 years. Percentile tables were constructed for each test item based on age and sex. Alabama means were compared with national means. T-test was used to determine significant difference between the means. Alabama students performed better in events measuring agility, speed and cardiovascular endurance. The national group performed better on events measuring abdominal muscular endurance and flexibility.

Massicotte, Gauthier and Markon (1985) took up the study to verify the validity of specific parameters of cardio-respiratory endurance and anthropometric measurements that existed amongst the young on a run of 1600 meters for 10-12 years old, and 2400 meters for 13-17 years old children. The sample was randomly selected and was comprised of 159 boys and 162 girls, aged 10-17 years old. The endurance test was performed on an external surface. During the 3 days prior to or following the tests on the course, the VO2 Max was measured while the subjects performed a maximum workload on the bicycle ergometer. The correlations between the time and to complete the run and the VO2 Max. Varied from 0.62 and 0.84 for the different age and sex groups. The correlations were similar for both sexes for the 1600 meters, while the value was higher for the girls on the 2400 meters distance.

Singh (1986) prepared physical fitness norms for high school boys of Punjab State. Data were collected on five thousand subjects from the various schools in the state. The test administered consisted of eight items i.e. standing
broad jump, sit and reach test. Agility run, sit-ups bent knee, 50 metres dash, push-ups (Chairs), cricketball throw and 600 metres run-walk. The percentile norms for physical fitness tests were found to be valid and suitable to assess the physical fitness level of the high school boys in the age group of 12 to 15 years.

Singh (1986) undertook a study on four thousand college students of Panjab University, Chandigarh. Fleishman’s Test battery was used on 17 to 22 years old students. In conclusion he found that physical fitness improved linearly according to age, and the students belonging to the rural area were significantly superior in their performances on different items.

Heyward H-Vivian (1986) examined gender differences in upper and lower body strength as a function of lean body weight and the distribution of muscle and subcutaneous fat in the upper and lower limbs. 103 physically active men (N=8) and women (N=55) were the subjects. The peak torques produced during shoulder flexion (SF) and knee extension (KS) were used as measures of upper body and lower body strength, respectively. Flexed arm girth/thigh girth, triceps skinfold, and thigh skinfold were used to estimate the distribution of muscle and subcutaneous fat in the limes. Results of HACOVA indicated that the SF and KB strength of women and men did not differ significantly when differences in lean body weight, arm girth, thigh girth, triceps skinfold and thigh skinfold were statistical by controlled. High levels of SF and KE strength were associated with a high lean body weight and a large arm girth. Results of the multiple regression analysis indicated that for men a substantial portion of the variance in both SF and KE strength was explained by lean body weight; whereas strength variations in women were adequately explained by including limb variables alongwith lean body weight, within the limitations of this study. It was concluded that gender differences in upper and lower body strength in lean body weight and the distribution of muscle and subcutaneous fat in the body segments. Upper body strength is relatively more important than lower body strength in characterizing the gender difference in strength.

Ranganathan (1986) conducted an assessment and an analysis of the motor
performance of elementary school children. The purpose of the study was to assess cross sectionally the changes in the motor fitness of elementary children of six through II years randomly selected and standard motor fitness test items were administered to them. To gauge the different motor fitness components of strength, muscular endurance, cardio-vascular endurance, speed, power ability and flexibility, tests of push-ups, the 600m run-walk, 50m dash, the standing broad jump, the 4 X 100 meters shuttle run, and trunk flexion were used. The reliability of all the tests established using the test retest method. All tests were conducted with the help of persons competent in this field and the scores were recorded separately. The results indicated that performance advanced with increase of age, except in the case of the shuttle run and trunk flexion, where decreasing performance was shown after age nine.

Uppal and Sareen (1986) made an effort to study cardio-vascular endurance differences in rural-urban school students of Delhi. (N=60) each urban-rural students randomly selected for the purpose of the study. Harvard stop test (Short Form) was administered for the assessment of cardio-motor endurance. The results of the study showed rural area students to be superior to urban area students in cardio-vascular endurance.

Kim (1986) investigated the relationship between the Korean Youth Fitness Test (KHFT) and the AAHPER health related physical fitness test (HRPFT) for male Korean, middle and high school children. Eleven experimental test items were administered on three hundred male Koreans students of grade 7 to 11. The analysis indicated that the KYFT and AHRPFT were significantly related. AHRPFT can be substituted for KYFT, since these tests are fewer and easier test items. It was also concluded that the correlation between KYFT and AHRPFT was higher for the middle school students than for the high school students. There was a significant relationship between KYFT and AHRPFT for the middle and high school students.

Yadav, B.S. (1986) conducted a study for the standardisation of physical fitness norms of the school children of Haryana between the ages of 13 to 16
The study was a normative survey of physical fitness of boys belonging to three different age groups, viz. 13 to 14 years, 14 to 15 years and 15 to 16 years. The sample of the study was selected through multi-stage randomized design. In the first stage two schools were selected randomly from the boy's schools of each district. Secondly, 100 students were selected randomly from each school from the students of classes VII, VIII, IX, X and XI. Thus, a total sample of 3600 boys was selected. The sampled students were administered a physical fitness test battery that included the 50-metres run, standing broad jump, shot put, zig-zag run, sit ups and Harvard step test. The scores of the students in these tests were taken to establish norms.

Morgan's (1987), study second and the fifth grade students were involved in a eight weeks, five to ten minutes physical fitness programme. Four experimental and two controlled groups were pre-tested and post tested in 9-Minute Run, Sit Up and Sit and Reach.

Hilley (1988) compared the physical fitness of fourth grade children as measured by a curl-up test, a sit and reach test and skinfold caliper measurement. This investigation utilized four groups. The result of the study made the following conclusions - 1. Positive effect on the health related physical fitness performance. 2. Curl-up performance showed that fourth grade children tend to improve as a result of training. 3. Fourth grade children tend to exhibit a decrease in the sum of skinfold measurement.

Singh, Prem (1988) constructed physical fitness norms for male teen-agers of Jammu and Kashmir State. He used American Alliance for Health, Physical Education and Recreation Physical Fitness Test to measure physical fitness, which included: pull-ups, bent knee-sit ups, standing broad jump, shuttle run, 50 meter dash, 600 meter run/walk. The study concluded that the subjects belonging to age group 16 to 19 years showed better performance in all the test items, over the other age groups of 13 to 15 yeas. On the average, physical fitness improved linearly according to age. The scales i.e. percentile scale, Hull, scale and T-scale were also prepared for each age group separately.
Kaur (1989) developed the physical fitness norms for the high school girls of Punjab state belonging to the age group of 12 to 15 years. The subjects were selected from the various urban and rural schools of Punjab. Sample consisted of four thousand students by using Fleishman's test battery. In this study she concluded that the lower performance level of rural students in most of the physical fitness variables as compared to their urban counter parts. The percentage norms for physical fitness test were valid and suitable to assess the physical fitness level of school girls. She observed that the subjects belonging to urban residence were significantly superior to rural subjects in terms of dynamic flexibility, arm and shoulder.

Aujia (1990) in her study has observed differences in physical Fitness, if any, between Jat Sikh girls living in rural and urban areas in Punjab. (N = 202) each rural and urban Jat Sikh girls were randomly selected for the purpose of the study. The age ranged between 14-16 years. The result of the study revealed that urban girls were slightly higher in height. Further, the results show that rural girls were better in 100 meters, 200 meters, run vertical jump. But urban were better than rural in shot put.

Karir et al. (1990) studied the urban, rural differences in body size and physical performance among Punjabi girls ranging in age from 11-15 years of age. Nine somatometric measurements and three physical performance tests (Sargent jump. Standing broad jump and Shot put throw) were taken on (N == 154) each urban and rural Punjabi school girls. The study reported no distinct urban rural differences in body dimensions. However, amongst physical performance tests standing broad Jump and shot put events, show that the maximum urban-rural differences in favour of urban adolescent girls.

A modified form of the American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD) Health Related Physical Fitness Test was administered to a sample of 200 college physical education majors by Dinucci Jim et al (1990). The skin fold measures were removed from the original test. and the flexed arm hang was added to the physical fitness test battery. The study
determined the multivariate reliability of the modified test battery using a canonical correlation model. The Univariate inter class reliability of the test items ranged from .91 to .99. The total redundancy for the modified physical fitness test battery was .87.

Adams (1992) the purpose of this study was to investigate strength, power, flexibility and bone mineral density (BMD) in adult men, and further understanding of the relationship of strength and lean body mass to BMD. Strength, power, flexibility and BMD were measured in 40 active males 35 to 63 years old. These were three observation groups:

1. Competitive weightlifters (E) (n=13),
2. Recreational weightlifters (R) (n=14), and
3. Active, non-weighlifters (N) (n=13).

Strength of the back, quadriceps, biceps, adductor, and abductor muscles was measured using an isokinetic dynamometer. Power was tested with vertical jump test. Low back flexibility was assessed with a standard flexibility test. Mineral density of the proximal femur (hip), spine (L2-4), and whole body, and body composition, were evaluated by dual-energy x-ray absorptiometry.

T-tests revealed no significant difference (P<0.05) between the N and R groups in muscle strength, power, flexibility, and (BMMD). Therefore, these two groups were combined to form one group (NR). A significant 45% (P=0.0001), 34% (P=0.0002), 19% (P=0.0060), 18% (P=0.0018), and 10% (P=0.0058) greater difference was found in the group c over the NR group on back, quadriceps, biceps, adductor and abductor strength, respectively. Vertical Jump and flexibility were significantly greater by 28% (P=0.0001), and 17% (P=0.0440), in the c group values of lumber spine, femoral neck, total hip, and whole body BMD were significantly greater in the c group by 13% (P=0.0086), 12% (P=0.0235), 10% (0.0163), 19% (P=0.124), and 5% (P=0.285), respectively. Percent body fat was C=11.9±3.6%, R=14.6±3.6%, and N=17.4±2.3%.

In stepwise regression, back strength best predicted lumber spine BMD (R²=0.30), BMD>Ward's and trochanter BMD were best predicted by age, while
lean mass and back strength combined to predict whole body BMD.

This study suggest that competitive weightlifting may result in greater levels of muscle strength, power, flexibility and none mineral density that recreational weight-lifting or active weight-bearing exercise. The results of the study show a strong relationship between specific muscle strength and whole body and regional bone mineral strength and whole body and regional bone mineral density, with quadriceps and back strength being the dominant factors.

Chahal (1993) the purpose of this investigation was to develop task related physical performance standards based on muscular strength and endurance fitness components, and body composition, for male combat soldiers in the Canadian Army. Previously physical fitness standards for the Army have been based on norm reference approach and on, fitness, tests score (non relevant to occupation) of the normal army population. Representative selected common tasks for the study were casualty evacuation, ammunition box lift, maximal effort Jerry can task, maximal effort slit trench dig, and weight load march. Following laboratory test batteries were selected and developed based on the physical requirements of the chosen common field tasks : (a) Static and dynamic muscular strength test battery : (b) static and dynamic muscular endurance test battery: and (c) body composition variables.

Su (1993) undertook a study where she proposed: (a) to develop health related physical fitness norms for school children and youth of Taiwan, (b) to make age and gender comparison on each of the five physical fitness items. The subjects involved in this study were a randomly selected sample of children and youth of age group 7 to 18 years (N= 2,368) from Hsinchu, Taiwan. The data was collected by a small, traveling group of trained physical education students; seven stations were established at each site to collect data. Each subject completed the following test items: (a) bent knee sit-up test (b) Pull- up test, (c) Height and weight measurement, (d) sit and reach test, (e) modified pull-up test, (f) skinfold measurement, and (g) one-mile walk/run or half-mile walk/run.

Frenzoni, Molina Mighel (1994) conducted a normative study. The purpose
of the study was three folds: 1) Norms were established for 17 skill (fitness related) tests for third, fourth and fifth grade boys and girls. 2) The scoring abilities were compared on the same tests of four types of evaluators that included a physical education specialist, a regular class room teacher, the students subjects and students peers. 3) The fitness scores and skill abilities of the above mentioned children were compared those taught by physical education specialists to those taught by their class-room teachers. Results showed that the physical education specialist was evaluated significantly different than the classroom teacher on four 'fitness' tests. There were no differences among evatuators on any of the nine 'skill' tests. There were no differences between specialist taught schools and those taught by class-room teachers on any of the skill tests, but of the eight fitness test, the students from the non-specialist school performed better in five of eight fitness tests.

Tyagi (1994) developed physical fitness norms for boys and gins of "grade 9 to 12 of Delhi. AAHPER Youth Fitness test was administered to 3000 boys and 3000 girls of randomly selected 50 schools of Delhi- Analysis of the data revealed that this study exhibited no significant difference in physical fitness across age in both boys and girls. It was also observed that physical fitness was significantly correlated to height and weight in the case of boys and not in the case of girls.

Lee (1995) examined the degree of body fatness and the developmental trends of body composition of Korean youth. The goal of this study was to compare the body composition of Korean and American youth and to establish body fat standards of Korean youth. When compared to American youth, Korean youth, boys and girls, were shorter and lighter. In contrast, the triceps skin fold of Korean boys and girls was thicker than American youth. The skin fold and body mass index profiles of Korean and American youth followed similar patterns. The prevalence of overweight in Korean youth, boys and girls, was lower than American youth, but the prevalence of obesity in Korean boys was higher than U.S boys. In contrast, the prevalence of obesity in Korean girls was lower than U.S. girls.
Alexander, Pedro (1996) presented a research paper in international Pre-Olympic Scientific Congress, U.S.A. In this paper, he explained regarding the development and establishment of the National norms of physical fitness level, and morphological characteristics of the Venezuelan students. In this study, a sample of 7,063 subjects, (3461 males and 3602 females) from 7.52 to 18.4 years of age was undertaken. The results showed a better physical fitness level profile among the 11 years age groups. This study made possible to create the physical fitness and morphological standards for the Venezuelan Population within the 22 groups considered. This study was aimed to improve the process of quantitative evaluation of the physical fitness and morphological possibilities of students.

Esteves, Jose (1996) conducted a study for the physical fitness of the Macao population. The purpose of the study was to establish the norms for fitness of Macao and to make comparisons of the Juvenile's fitness indices between Macao and some Asian countries. 1547 students, ranged from grade 5 of elementary school to grade 3 of senior high school, were tested. The physical fitness test battery consisted of 20 items on body anthropometry; physiological ability and motor fitness and a questionnaire with 49 questions about diet, habit and family. The tests covered six same items that were used in "Asian Youth Health Related Fitness Test" (AYHFT), and the questionnaire included the questions of the consciousness on sports proposed by the Asian Regional Board of international Council for Health, Physical Education and Recreation (ICHPER). The statistical inference was used to make comparisons between mean of the population and the correlation between the variables. Finally, the database of the sample of Macao Juvenile Health Related Fitness was established for the reference of Macao concerned to improve youth fitness and guidance to physical education.

Hunter et al. (1997) reported the relationship between fat distribution, physical activity (PA), and cardio-vascular disease (CVD) risk factors and concluded that IAF is directly related to CVD risk while the lower CVD risk found with more active men is more directly related to the low IAF found in more active men.
Obara (1997) compared health-related physical fitness of high school students of Argyle Academy and Riverside Academy that have different physical education programmes and found that the students from Argyle Academy demonstrated significantly better scores for the 20 m shuttle run and trunk lift, while those from Riverside Park Academy demonstrated significantly better scores for the curl-ups and 90 degree push-ups. There was no significant difference in the sum of five skin folds, waist to hip ratio, and back saver sit and reach.

Thomas et al. (1997) described regional fat distribution and anthropometrics variable in an ethnically diverse sample of woman (N=143) who were between 20 and 30 (premenopausal) or 40 and 50 (per menopausal) years of age and of normal weight for height. Measurements included 11 skin folds (abdomen, biceps, calf, forearm, midaxillary, pectoral, sub scapular, suprailiac, suprapatellar thigh and triceps, waist and hip circumferences, height and mass. Regional fat distribution for African American, Mexican American and Caucasian women was described as flueal femoral. African American women had the smallest waist-to-hip ratio, with larger absolute measures for both the waist and gluteal than the Caucasians or Mexican Americans. Native American women have an abdominal fat distribution pattern which was explained by more fat on the abdomen rather than less fat on the gluteal area. Native Americans had a different fat distribution from the other ethnic groups. Caucasians were not a good comparison group for American Americans or Native Americans and found that variation within the ethnic groups was larger than differences between the groups for most variables.

Sardinha et al. (1999) investigated valid and practical methods based on health related criteria for obesity screening in children and adolescents. The results suggest that triceps skin fold thickness gives the best results for obesity screening in adolescents aged 10-15 years. Body mass index (BMI) and upper arm girth were reasonable alternatives. Except in 14-15-y-old boys, in whom
both indexes were only marginally able to discriminate obesity.

Kyle et al. (2000) determined the effects of regular physical activity on body composition, as measured by bio-electrical impedance analysis (BIA), in a large Caucasian population and concluded that physical activity was able to limit fat mass and weight gain in men over 25 yr of age and in women until 54 yr of age. Therefore, the benefit of physical activity seem to include maintenance or prevention of increase of body mass index (BMI) that in turn correlates with prevention of a fat mass increase of physically active subjects.

Hong Youlian et al. (2000) conducted a study on Balance Control, Flexibility and Cardio-respiratory Fitness among Older Tai Chi Practitioners. In this cross sectional study, 28 male tai chi chuan (TCC) practitioners with an average age of 67.5 years old and 13.2 years of TCC exercise experience were recruited to form the TCC group. Another 30 sedentary men aged 66.2 were selected to serve as the control group. Measurements included resting heart rate, left and right single leg stance with eyes closed, modified sit and reach test, total body rotation test (left and right) and a three minute step test. It was founded that compared with the sedentary group, the TCC group had significantly better scores in resting heart rate, modified sit and reach, total body rotation test on both right and left side (p<0.01), and both right and left leg standing with eyes closed (p<0.05). According to the American Fitness Standards, the TCC groups attained the 90th percentile rank for sit and reach and total body rotation test, right and left.

Devi (2000) conducted a comparative study of physical fitness and psychological traits of tribal and non-tribal high school students on a sample of 1200 drawn from high altitude. Fisherman Physical Fitness Test Battery was used for the purpose. She concluded that:

1. The tribal (boys and girls) were found superior in explosive strength than the non-tribal (boys and girls).
2. The non-tribal (boys and girls) were better in extend flexibility than the tribal (boys and girls).

3. The tribal boys were found superior in agility and dynamic flexibility to the tribal boys.

4. The non-tribal boys were better in endurance than the tribal boys.

5. The tribal girls were better in speed and endurance than the non-tribal girls.

6. The non-tribal (boys) of lower altitude was better in dynamic flexibility than the non-tribal boys of higher altitude.

Huff (2000) investigated the difference in the physical fitness levels between home school students and public school students. When the data from this research were compared to the national norms, 56% of the female home school students, 48% of the male home school students, 39% of the male public school students, and 35% of the female public school students scored above the 50th percentile. Since physical fitness assessment of home school students is a new field of research, there is a paucity of empirical evidence to support or reject these findings.

A study was undertaken by Vinod Kumar Bakshi (2001) "Assessment of health related physical fitness of school students belonging to Jammu province. A sample of 4000 subject was selected between age group of 13, 14, 15 and 16. AAHPER health related fitness test battery used for this purpose. He concluded that a significant difference between one age group to other age group of the rural boys in all the fitness components.

Roy Chin Ming Chan, et al. (2001) indicated that for seven psychometric items i.e. body fat, activity, sports competence, health, appearance, global physical self-concept, and global esteem, boys' scores were significantly higher than girls. They also indicated that health related fitness is highly related to psychometric items such as perceived sport competence, perceived activity level, perception of body fat and global physical self –
Miller (2001) states that despite great public interest in health and physical fitness, opportunities for exercise in a child's school day are declining as school administrators often choose to cut physical activity time in favor of classroom instruction time. An posteriori Tukey's analysis of the interaction effect showed that classroom behavior was significantly improved during the walking session versus the other non-walking sessions for each class.

Dean (2001) determined the effect of a female physical educator's physical appearance on the cognitive performance of junior high school students on a test of health related fitness knowledge. AAHPER examination was administered to the students in a pre-test and post-test format. Additionally, students attitude towards the physical educator were assessed. A student attitude questionnaire (SAQ), which included 8 items and required responses on a 5-points Likert scale was administered to the students. Post-test means were compared between groups with the pre-test score assumption of homogeneity for both groups, a significant group x post-test score interaction existed: SAQ sums were analyzed for all participants and detected no significant group x time interaction. Paired t test showed that significant differences existed between all combinations of SAQ mean scores, except for the values of week one to week three, which demonstrated a trend toward being significant.

Ball et al. (2001) provided the detail of the recent world wide increase in the prevalence of childhood obesity may be due in part to a decrease in children’s physical activity levels. There was no significant difference in physical activity level between boys and girls but not girls, physical activity level was inversely correlated with body mass index (BMI) and percentage of body fat. In boys but not girls, percentage of body fat was inversely associated with physical activity level. Physical activity was one factor contributing to body fatness in boys, but additional factors may influence the size of the fat
stores in girls.

Casas et al. (2001) found that indirect measures of body composition suggest that Hispanic women have an excess prevalence of overweight and obesity compared with white women. Socio economic status (SES) is a potentially confounding factor in such studies and found that total fat free mass (FFM) was slightly but significantly lower in the Hispanic women (39.9±0.6 compared with 40.9±0.6 kg; P=0.01 ), primarily because of a smaller FFM in the trunk region (P<0.05). Among healthy women, Hispanic (Mexican American) ethnicity may be associated with modestly higher level of adiposity and slightly lower amounts of FFM overall and in the trunk region in particular.

Santana et al. (2001) concluded that body composition changes with age, with increases in fat mass and visceral fat and declines in skeletal muscle mass; lung function also declines with age. Age related changes in body composition and fat distribution may be associated with the pulmonary impairment observed in the elderly.

A significant negative correlation was found between adiposity, fat distribution indexes, forced vital capacity (FVC), and forced expiratory volume. A positive correlation was found between fat free and FVC. The cross-sectional data showed a significant association between body composition, fat distribution, and lung faction in elderly men.

Ciccomascolo (2001) compared the effect of two types of undergraduate physical education classes, Wellness and fitness, on health behaviors of college students. The results suggest that students in the Wellness group had more social interaction with peers and their instructor and were able to focus on attaining their health behavior goals. Also, students in Wellness courses may have learned why they should balance their physical, social, and emotional dimensions in life and not just how to do so. Conversely, the focus of fitness based courses is primarily on the physical dimension.

Ruiz (2001) conducted a study on 279 Hispanic children who were
enrolled in sixth grade physical education classes in a South Texas area intermediate school. General linear model analyses revealed that: (1) the attitudes towards physical activity domains, gender and their interaction were not statistically significantly related to the self-reported physical activity level of the participants; (2) the attitudes toward physical activity, gender, and their interaction were statistically significantly related to the cardiovascular endurance of the participants; and (3) the self-reported physical activity level, gender and their interaction were statically

Pierce (2001) conducted a study to examine the changes in Physical Activity (PA), fitness, and potential mediators of Physical Activity (self-efficacy, decisional balance (DB), and stage of change), measured 18 week following completion of a Personal Physical Fitness (PPF) class. Results suggested maintenance of Physical Activity, fitness, and mediators of Physical Activity for five months following a PPF class and a consistent relationship between PA, fitness and mediators of PA. Moreover, there was no added benefit to providing a minimal contact intervention during this period.

Mcmillan and Erdmann (2001) described gender-specific health-related physical fitness measurements in kindergartners and determine relationship between body fatness and health-related physical fitness test performance. Significant positive relationships were found between SSK and 1-mile walk/run times for both boys and girls. Significant inverse relationships were found between SSK and 1-min bent-knee sit-ups for both boys and girls. Neither boys nor girls showed a significant relationship between SSK and sit and reach. Excluding the sit and reach test, researcher found higher body fatness to be significantly associated with poorer health-related physical fitness test performance in both kindergarten boys and girls.

Barfield et al. (2001) documented that children tend to track in the same fitness categories (at risk-note at risk for poor fitness) from grades 5 through 7. In the current study, consistency of classification on the body mass
index was higher among older girls than younger. Although gender differences were noted in grades 3 and 4 on strength and aerobic capacity scores (i.e., higher agreement among boys), gender was not associated with consistency of classification on other tests across grade levels.

Heitmann and Garby (2002) examined the composition of weight change in relation to obesity, previous weight changes, weight loss attempts, and physical activity and found that the data do not support the theory that weight loss or weight cycling may lead to an unfavorable body composition, nor do they provide a biological explanation for why long-term weight loss is often unsuccessful. However, the metabolic and health consequences of weight change may differ in men and women.

Stephen et al. (2002) conducted a study on a Physiologic, Psychological, and Health Predictors of 6-Minute Walk Performance in Older People and found that all physiologic, psychological, and health scores were significantly associated with 6 minute walk distance (6MWD). It also revealed that 10 factors (visual contrast sensitivity lower-limb strength, simple reaction time, postural sway, maximal balance range, PANAS positive scale score, SF-36 pain score, number of medications used, SF-36 general health subscale score, age) were significant and independent predictors of 6MWD performance.

Loos et al. (2002) evaluated the intrauterine environment that may be critical for the development of obesity and found that the same genetic factors may influence both birth weight and adult body composition. Birth weight also accounts for some of the differences in adult body composition between twins.

Jermo et al. (2002) conducted a study on a Health-Related Fitness and Functional Performance Test Battery for Middle-Aged and Older Adults: Feasibility and Health-Related Content Validity. Strong and graded associations were found for cardiorespiratory and musculoskeletal fitness and the FP tests levels with perceived health and functional ability status among both men and women.
Patterson (2002) determined a functional relationship between distant interaction (a component of active monitoring) by physical education teachers and elementary students moderate to vigorous physical activity (MVPA) levels during fitness instruction. The results indicated the use of distant interaction increased the MVPA. The significant differences existed between all combinations of SAQ mean scores, except for the values of week one to week three, which demonstrate a trend toward being significant.

Ortlepp et al. (2003) conducted a study on Relation of Body Mass Index, Physical Fitness, and the Cardio-vascular Risk Profile in 3127 Young Normal Weight Men with an Apparently Optional Lifestyle. Low body mass index (IBM) revealed to be significantly associated with high physical fitness, low blood pressure, and low serum lipids.

Santa-Clara et al. (2003) conducted a study on Effect of a One Year Combined Exercise Training Programme on Body Composition in Men with Coronary Artery Disease. The results suggest that a long-term combined training (CT) programme is more effective than an aerobic training (AT) programme alone in producing changes in body composition. The percentage changes in total and trunk fat mass were higher in CT than in AT.

Koutedakis et al. (2003) conducted a study on National Physical Education Curriculum: Motor and Cardio-vascular Health Related Fitness in Greece Adolescents. It has been found that children in the physical education (PE) group had inferior motor and cardio-vascular health related fitness profiles compared with those in the PE+ group. Body fat, aerobic fitness, and time spent in intensive physical activity showed the greatest differences between the two groups. In the pupils in the PE group, these were lower than the levels proposed to be necessary to combat future health risks. Adjustments for confounding variables showed a decrease in the significance of motor fitness, but not in cardio-vascular health related parameters.
Camethon et al. (2003) studied Cardio respiratory Fitness in Young Adulthood and the Development of Cardio-vascular Disease Risk Factors and found that participant with low fitness were 3 to 6 fold more likely to develop diabetes, hypertension, and the metabolic syndrome than participants with high fitness. The association between low fitness and hypercholesterolemia was modest 95% confidence interval and attenuated to marginal significance after body mass index adjustment. Improved fitness over 7 years was associated with a reduced risk of developing diabetes and the metabolic syndrome, but the strength and significance of these associations was reduced after accounting for changes in weight.

Short et al. (2004) conducted a study on Age and Aerobic Training Effects on Whole body and Muscle Protein Metabolism. Seventy-eight healthy, previously untrained men and women aged 19-87 year were studied before and after 4 month of bicycle training (up to 45 min at 80% peak heart rate, 3-4 days/wk) or control (flexibility) activity. At the whole body level, protein breakdown (measured us [13 C] leonine and [15 N] phenylalanine flux), Leu oxidation, and preteen synthesis (nonoxidative Leu disposal) declined with age at a rate of 4-5% per decade (p<0.001). Fat free mass was closely correlated with protein turnover and declined 3% per decade (p<0.001), but even after covariate adjustment for fat-free mass, the decline in protein turnover with age remained significant. There were no differences between men and women after adjustment for fat-free mass. Mixed muscle protein synthesis also declined with age 3.5% per decade (p<0.05). Exercise training improved aerobic capacity (9%) overall (p<0.01), and mixed muscle protein synthesis increased 22% (p<0.05), with no effect of age on the training response for either variable. Fat-free mass, whole body protein turnover and resting metabolic rate were unchanged by training. Thus conclude that rates of whole body and muscle protein metabolism decline with age in men and women, this indicating that there is a progressive decline in the body are remodeling processes with aging. Thus study also demonstrates that aerobic exercise can enhance muscle protein
Storer et al. (2005) conducted a study on Endurance Exercise Training during Haemodialysis Improves Strength, Power Fatigability and Physical Performance in Maintenance Haemodialysis Patients on Twelve MHD Patients. They performed incremental and constant work rate cycle exercise tests to determine peak work rate, VO2 peak and endurance time (ET). Lower extremity strength, power and fatiability, stair-climbing time, 10 m walk time and a timed up-and go were assessed before and after 8.6+2.3 weeks of thrice weekly, progressive, semi-recumbent, leg-cycle training during haemodialysis. Initial training intensity and duration targets were set at 50% peak work rate (WR) and 20 min, respectively, with a goal of progressing to 40 min at the highest WR tolerable. Non-exercising MHD patients and healthy volunteers with similar age, gender and race/ethnicity served as comparison groups and concluded that nine weeks of leg-cycling during haemodialysis in MHD patients improves not only cardiopulmonary fitness and endurance but also muscle strength, power, fatigability and physical function. These data underscore the value of endurance training in MHD.

Davis Melissa (2005) the primary purpose of this study to determine the Relationship of Self-Reported Resistance Training to Lipid Profiles. The study consisted of 10 subjects between the ages of 19 and 35. Participants were assigned to an exercise group or control group based on self-reported resistance training and according to ACSM standards. After means were determined for the data gathered, the exercise group had lower averages of weight, percent body fat, total cholesterol, low-density lipoprotein and triglycerides, as well as, a higher average of high-density lipoproteins. Two sample t-test were performed to determine significance. It was determined that no significant difference existed between serum lipid profile levels of the control group and the self-reported exercise group. This study is important because it expands our knowledge of the relationship between resistance training (RT) and lipid
profiles, relying on self-reported data and focusing on an at-risk population.

Thaddeus Haight (2005) conducted a study on the Effects of Body Composition and Leisure-Time Physical Activity on Transition in Physical Functioning in the Elderly. Physical activity and body composition were examined with respect to variation in function imitation over a 6-year period (four surveys conducted between 1994 and 2000) based on a cohort of 1,655 community-dwelling older men and women living in Sonoma, California. Measures of functional limitation and physical activity were based on standard self-report questions. Measures of body composition (lean mass, fat mass) were estimated from bioelectric impedance by using population-specific prediction equations derived from dual-energy x-ray absorptionmetry. For women, a one-unit gain in lean mass: fat mass ratio reduced the report of limitation at all survey 65.5% (95% confidence interval: 21.8, 87.4). A similar reduction was not observed for men; however, there was a 3% increase in the report of no limitation at any survey. The effect of high levels of physical activity reduced new functional limitation occurred at the last survey by 36.8% (95% confidence interval: 0.0, 92.2) for men and 52.7% (95.5% confidence interval: 13.5,91.9) for women. In summary, higher levels of physical activity appeared to reduce the risk of future functional limitation conditional on the level of functional limitation conditional on the level of functioning established early in the disablement process by lean mass: fat mass ratio.

Mikkelsson et al. (2006) conducted a study on Adolescent Flexibility, Endurance Strength, and Physical Activity as Predictors of Adult Tension Neck, Low Back Pain and Knee Injury: For this purpose 250 men and 605 women participated in a sit and reach test (flexibility) and a 30 second sit up test (endurance strength) and completed a questionnaire. Lifetime occurrence and risk of self reported low back pain and self reported, physician diagnosed tension neck and knee injury were calculated for subjects divided into tertiles by baseline results of strength and flexibility tests. It was found that men from
the highest baseline flexibility tertile were at lower risk of tension neck than those from the lowest tertile (odds ratio (OR) 0.51, 95% confidence interval (CI) 0.28 to 0.930. Women form the highest baseline endurance strength tertile were at lower risk of tension neck than those from the lowest tertile (OR 0.06, 95% CI 0.40 to 0.91). Men from the highest baseline endurance strengths tertile were at higher risk of knee injury than those from the lowest tertile (OR 1.96, 95% CI 1.05 to 3.64). Men who at school age participated in physical activity were at lower risk of recurrent low back pain) or 0.61; 95% CI 0.42 to 0.88) than those who did not. Hence concluded that overall good flexibility in boys and good endurance strength in girls may contribute to a decreased risk of tension neck. High endurance strength in boys may indicate an increased risk of knee injury.

DISCUSSION OF REVIEW OF RELATED LITERATURE

The abstracts of most of the studies complied in this chapter are related to the area physical fitness and some related to the health related fitness. Since the concept of health related fitness has appeared in the late only since 1980 by H. Harrison Clark, a very few research have taken initiative to explore health related fitness for elderly people. However, what ever effects made by some of the scholars carried the different approach from the present researcher. Therefore, the studies pertaining to health related fitness for elderly people do not carry much scope for the discussion.