CHAPTER II
REVIEW OF THE RELATED LITERATURE
CHAPTER-II

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Research scholar has made his 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 direction on physical fitness components with various other relative components like: physical education and sports, physical fitness personality development, education, growth and development etc.

The research scholar also gone through the numerous studies which have been conducted on physical fitness aspects with various co-relative components in a different manner. The research Scholar also attempted to review the literature available with the various libraries related to physical education, sports and education.

The researcher has tried to scan the available literature to select studies, which were directly or partially related to the present study. An attempt has been made to present a summary view of literature, which may be helpful in understanding and bringing out meaningful outcomes from the study. The following related references have been reviewed as under:

Chattopadhyay made and attempt to compare physical fitness of the University level schooner players and hockey players. The criterion measures selected for assessing the physical fitness was resting pulse rate. Cooper's 12 minute run/walk and AAHPER fitness test batter and he found out that there is significant difference only in 50 yards dash favoring the soccer team and Pull-ups favoring the hockey team.

Christian G. Ronald\(^1\), studied the contribution of selected variables to college football performance. The criterion members of the southeastern state college football teams were selected for this study. From the multiple correlation coefficients it ‘as found that best predictor of game percentage for back was lateral movement. For the live best predictor of game percentage score as bench step when he combined groups

the best predictor of game percentage score was the vertical jump. It was concluded
that for the total group, the vertical jump and 12 minutes run were the best predictors.

Loyd\(^2\), administrated the AAHPER Youth Fitness Test on 400 Negro and
white boys from the same Texas district. It was found that Negro boys obtained
higher mean scores as compared to white boys on gross body co-ordination (soft ball
throw) Negro boys scored significantly higher than white boys on muscular
explosiveness (standing broad jump). A longer mean difference was obtained at 0.05
level of confidence.

Shekhar\(^3\), Conducted a study to compare the selected physical fitness
components. i.e. speed, extending flexibility, leg explosive strength, gross body co-
ordination, and respiratory endurance of soccer and basketball players. On the basis of
analysis of data the following conclusions were drawn. The basketball players were
comparatively superior to football players in extended flexibility and dynamic
flexibility. The soccer players were found to be higher in leg explosive strength,
abdominal strength and gross body co-ordination.

Nicolau\(^4\), conducted a study through 9 basis fitness tests developed by
Fleischmann, which were administered to, the 1964 varsity football squad at the
university of Bridgeport before and alter the pre-season conditioning programme as
an index of football fitness. Half of the players used to traditional programme
consisting of a short job stretching exercise push-ups, sit ups, leg raises toe touching,
neck bridging, grass drill and running in a circle at top speed over players who were
lying down. The other half used the circuit training principle with vertical-jump push-
ups, leg lifts squat thrust, step-ups, bent arm hangs, grass drill and dips at the 8
stations. The circuit-training group improved significantly while the traditional group
did not, but the difference in improvement was not significant.

\(^2\) Ealph Loyd, “Comparision of Physical Fitness of Negro and White Boys of Same Texas District”,

\(^3\) Chander Mohan Shekhar, A Comparative Study of Selected Physical Fitness Components of Football

\(^4\) Clinton H. Nicolau, "Motivation Related to Performance of 2 Physical Fitness Tests", *Research
Quarterly;* 34:4, December 1993, P. 497.
Norman⁵, administered the AAHPER Youth Fitness Test to 100 rural and 100 urban boys. The urban boys were superior to the rural boys and the difference was significant at 0.01 levels. These samples were weaker on the same component of physical fitness.

Chauhan⁶, the study was conducted to compare the physical fitness level of college Kho-Kho player of rural and urban areas's with that of urban areas. Two colleges from rural and urban areas were selected and 120 students (from each) were measured in respect of their physical fitness by the administration of JCR Test. It was concluded that physical fitness of the college Kho-Kho players of rural areas was significantly higher than that of the players of urban areas.

Sushila⁷, The proposed of the study was to compare general physical fitness of women basketball and handball players. The total 40 inter collegiate female basketball and handball (20 from each game) players were selected randomly from the Amravati University and tested by D.G.W.S. test significantly differences of means were computed by 't' test at 0.5 level of confidence.

It was concluded that the average physical fitness at women basketball players was superior to that handball player.

Deshmukh⁸, The purpose of the study was to compare physical fitness of Kho-Kho and Basketball players. Eight players each of Kho-Kho & Basketball were randomly selected from selected affiliated college of Amravati University. These female subjects were into age group of 18 to 20 years. Administrating the AAHPER Youth Physical Fitness Test tested this 90 subject each of Kho-Kho and Basketball.

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It was concluded that Physical Fitness of the Kho-Kho players was found significantly superior to Basketball players at inter-collegiate level.

Khatri\(^9\), Conducted a study with a proposed to compare high and low physical fitness groups on anxiety level. The AAHPER Youth Fitness Test was conducted on seventy male students of B.Sc. (Physical Education, Health Education and Sports), University of Delhi. The age was ranged from 16 to 25 years. On the basis of physical fitness, high and low fitness groups were divided as upper (27%) subjects respectively. The anxiety level was tested through Sports Competition Anxiety Test (SCAT).

To analysis the scores of both groups on anxiety level, ‘t’ test was employed. The level of significance for testing the hypothesis was set .05 level of confidence. The mean of anxiety level high fitness groups was 18.5 and mean of low fitness group was 18.2. The calculated ‘t’ value was 0.24 on anxiety level, which showed the insignificant differences between high and Low fitness groups. The tabulated 't' value was 2.02, which was significant for 38 degree of freedom at 0.5 level of confidence.

Kumar\(^10\), Conducted a study with a proposed to find out the relationships between physical fitness components with handball playing ability. Total fifty college male students from University of Delhi were selected as subjects, who represented Inter-Collegiate Handball Championship (Men) 1995. The age ranged 17 to 25 years. The physical fitness components like: Grip dynamometer, Leg-dynamometer, Pull-up, Shuttle-run, Chin-up, 12 Minutes Run/ Walk, Half-squat jump, 50 Yard dash with Handball playing ability were tested throwing, dribbling and passing. The Product Moment Correlation method was employed.

On the basis of the results, the study was conducted as: 1) Squat test was significantly correlated with playing ability, 2) Right and left hand grip strengths, back strength and leg strength were insignificantly correlated with playing ability. 3)  


50 Yard dash as negatively correlated with playing ability 4) Push-up and shuttle run were found to be insignificantly correlated with playing ability of Handball.

Singh, The proposed of this stud was to compare the physical fitness level of rural & urban schools middle distance runner. Hundred male middle distance of 6th & 9th grade were selected from the rural & urban school. The subjects tested by AAHPER Youth Fitness lest & score was converted into composite score. To find out the significance differences it, test has computed and tested a-0.5 level confidence.

It was concluded that there were no significance different in physical fitness level obtains from AAHPER Youth Fitness test between the rural & urban middle distance runner.

Matharu, conducted a study with a proposed to compare the physical fitness variables between football players and sprinters of inter-college from Delhi University. The subjects were randomly selected for each group of football players and sprinters (short distance runners). The physical fitness status was measured through "AAPHERD Youth Physical Fitness Test Battery was the test items were: Pull-Ups, Bent Knee Sit-Ups, Standing Broad Jump, Shuttle Run, 50Yard Dash and 12 Minute Run/ Walk and the physiological practice, Hood pressure (systolic), Blood pressure (diastolic), Pulse-rate, Respiration-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 sprinter 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 Minute Run Walk (265) against the tabulated significant value of ‘t’ .05 (29) = 2.04 at .05 level of confidence.

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The ‘t’ test values of physiological variables were found insignificant difference among football players and sprinters. The calculated ‘t’ values were; Blood pressure systolic (1043), Blood pressure diastolic (1053), Pulse rate (1.05), 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 in regard to physical fitness and physiological tests except in Blood-pressure (systolic).

Bandyopadhyay\textsuperscript{13}, undertook a study to find out the relationship of physical fitness and motor ability to soccer male players studying in undergraduate classes of Lakshmibai College of Physical Education, Gwalior were selected for anthropometrics measurement (chest girth, upper arm-girth, thigh girth, height and weight); Physical Fitness Test (AAHPER'S Youth Fitness Test) and motor ability (Barrows motor ability test) and Soccer Skill Performance (McDonald Skill Test); zero order correlation was computed and it was concluded that (i) there is high correlation between physical fitness and soccer skill performance (ii) the upper arm wrist, chest wrist, calf wrist, height and weight had no relationship with soccer performance.

Gautam\textsuperscript{14}, conducted a study with a purpose to gained out the physical fitness, attitude towards physical activities and adjustment among the college level female students. 100 female students of Delhi University in the age ranged between 17 to 20 years were randomly selected. AAPHER Youth Fitness Test was used. The result of the study indicated that the female students of Delhi University were found significant better in physical fitness than the rural area. The attitude towards physical activity and sub-dimensions was found significantly higher in urban area student than of rural areas. Similarly, the urban area female students were found better adjusted than rural area female students.


Backford\textsuperscript{15}, conducted a study to evaluate the physical fitness level of Navajo Boys through American Alliance for Health; Physical Education and Recreation Youth Fitness Test. Navajo girls from 14-16 years were selected from seven college to measure physical fitness level. Also percentile norms were compared to National norms found in the manual accompanying the American Alliance for Health, Physical Education and Recreation of Youth Fitness Test. The results provided an indication of the overall fitness level of 14, 15 and 16 years.

Navajo girls of the seven items. The Navajo norms were found to be below "National Norms' of five items and above of the softball throw and 600-yard run/walk.

The skin fold measurements were changed from the original test, and the flexed arm hang was added to the physical fitness test battery. The validity and reliability of the test battery has already been established for middle schools boys and girls. The study determined the multivariate reliability of the modified test battery using a canonical correlation model. The universally interclass reliability of the test item ranged from 0.91 to 0.99. The total redundancy for the modified physical fitness test battery was 0.87.

Verma\textsuperscript{16}, conducted a study to develop the test battery for measuring physical fitness of Indian boy among the age group of 9 to 12 years. The s consisted of 500 boys of the Central school of India. Twenty on test items were selected for the purpose of the study conversing speed, strength, agility, balance, flexibility and endurance. The data obtained from 21 tests were subjected to two types of analysis. Under descriptive analysis, various measures were obtained in order to have an idea about the characteristics of all 21-test items. Secondly, factor analysis and the final solution so obtained were used to identify the different factors of general fitness. These factors were given an appropriate name depending upon the characteristics of variables it contained. Finally, the test batter for measuring general fitness was developed by picking up on variable from each factor

\textsuperscript{15} Patrioria A. Backford, "A Normative Study of the Physical Fitness for 14, 15 and 16 years old Navajo using AAHPER Youth Fitness Test Battery", \textit{Completed Research in Health, Physical Education and Recreation}, 14, 1996, P.159.

having the highest loading. The battery thus, constituted for the following test items were namely; 40-meter dash for speed, 9 minutes run/walk for endurance and shutter run in standing position for agility.

Tyagi\textsuperscript{17}, conducted a study on physical fitness norms for boys girls and grades nine through twelve of Delhi State. Six thousand students (3000 boys + 3000 girls) belonging to Senior Secondary School in grade 9 to 12 of Delhi State acted as subjects for the study. For this purpose 1000 boys and 1000 girls were selected at random from selected 50 schools in each age group of 14,15 and 16 years To measure the physical fitness of selected subjects, AAHPERD Youth Fitness Test namely pull-ups (boys), flexed arm hang (girls), bent knee sit-ups, standing broad jump, 4x 10m shuttle run, 50m Dash, 600m Run/Walk and height and weight were selected. Age wise norm for boys and girls in terms of percentile scales and 6-sigma scales were constructed for each item of the AAHPERD Youth Fitness Test separately and compared across by applying analysis of Variance. To find out the relationship of physical fitness to height and weight, Zero Order Correlation was computed. For testing the hypothesis 0.05 level of significance was chosen. Analysis of data revealed that various age group employed in this study exhibited no significant differences in physical fitness across age in both boys and girls as the obtained F-ratio of 0.41 and 0.81 were less than F.05 (df 2.2997) = 2.99. It was also observed that physical fitness was significantly correlated to height and weight ($r=0.177$ and $r=0.083$ respectively) in case of boys. The obtained correlation was significant at F.05 (df 2.2998) = 0.062, whereas in the case of girls, height was not significantly related to physical fitness, as obtained correlation coefficient $r=0.06$ was less than r.05 (2.998) = 0.062 but weight was significantly and negatively correlated with physical fitness as obtained coefficient of $r=-0.223$ was greater than r.05 (2998) = 0.062.

Jackson and Baker\textsuperscript{18}, conducted a study on 825 young females with AAHPERD Health Related Fitness Test to measure back and hamstring flexibility in the Physical Fitness Test.

Walker\textsuperscript{19}, conducted a comparative study of Physical fitness of white and black female students at northern high school AAHPERD Youth Fitness Test was administered on randomly selected 50 black and 50 white female 10\textsuperscript{th} grade students. Statistically analysis showed that the black subject scored significantly higher score 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 significantly higher than black subjects on abdominal strength did (M=31.5% and 24.7%). No other comparisons were significant.

Elnasher\textsuperscript{20}, conducted this study on 399 males and 311 females aged 9 to 18 years enrolled in physical education classes Fayoum Egypt and were evaluated using the six items of AAHPERD Youth Fitness Test Comparison of 50% with American norms revealed that Egyptian sample was substantially below average fitness in both sexes across all the age groups. Only pull-ups in male persons and flexed arm hang in female person in the early age group were above American Standard comparison between male and female revealed male significantly superior.

Saha\textsuperscript{21}, compared the selected anthropometric measurement and physical fitness variables of the tribal and non-tribal students of Tripura. The subjects were 60 male students of tribal origin and 60 male students from non-tribal group and their age ranged from 14-18 years. Anthropometric measurement was taken systematically in all subjects. Three selected item i.e. 50 meters dash, 50 meters shuttle run and 600 meters run walk of AAHPERD Youth Fitness Test were administered and were statistically analyzed by using t-scale. It was concluded that (1) in anthropometric measurement and physical fitness component, the mean scores of the composite score of tribal school students was higher than that of the non-tribal school students (2) There was no significant difference in anthropometric measurement and in physical fitness level. (3) The tribal students were superior in upper arm girth, calf girth and body weight while non-tribal students were superior in shuttle run. But there was no

\textsuperscript{19} Adel M. Elnasher, "A Study of AAHPERD Youth Fitness Test Resulting for Egyptians Male and Females", \textit{Completed Research in Health, Physical Education and Recreation} 24 (1992), P.111.
\textsuperscript{20} Umesh Chander Saha, "Comparison of Selected Anthropometric Measurement and Physical Fitness Variables of Tribal and Non Tribal Students of Tripura", \textit{Unpublished Master's Dissertations}, Jiwaji University, Gwalior, 1991.
difference in chest girth, thigh girth, height, 50 meters dash and 600 meters run/walk of the both tribes. That of the non-tribal school students. (5) There was no significant difference in anthropometric measurement and in physical fitness level. (6) The tribal students were superior in upper arm girth, calf girth and body weight while non-tribal students were superior in shuttle run. But there was no difference in chest girth, thigh girth, height, 50 metres dash and 600 meter run/walk of the both tribes.

Mookherjee\textsuperscript{22}, made a comparative study of physical fitness of young boy in the age group of 13 to 17 years belonging to rural and urban and also less active boys of same age group. The result of this study was that there is no doubt that regular physical activity contributes significantly to the enhancement of physical status. Physical fitness of rural active subjects was definitely of superior level than the boys living in the city. Pure food, fresh unpolluted air and reasonable regular physical hardships are chief contributing factors in promoting physical fitness.

Huff, Nancy Hasbin\textsuperscript{23}, conducted a study on comparison of physical fitness level of home school and public school students in South Alabama. The differences in the physical fitness level between home school students and public school students were investigated. The APPHPERD Test was used to measure the physical fitness levels. The statistics analyzed indicated that the home school students were significantly more physically fit than the public school students in the area of upper body strength and endurance, flexibility and cardiovascular endurance. There was no significant difference in abdominal strength and endurance between home school and public school students. Comparison made with the State Scores revealed that the students from South Alabama scored higher than the public school students across the State of Alabama with the exception of upper body strength and endurance for male students and upper body strength and endurance, and cardiovascular endurance for female public school students. When data from this research was compared to the national norms 56% of the female home school students 48% of the males home

\textsuperscript{22} Huff, Nancy Hasbin, "A Comparison of Physical Fitness Levels of Home School and Public School Students in South Alabama, "\textit{Dissertation Abstracts International 61}" (August 2000), P. 544-A.
school students 39% of the female public school students score above the 50%. Since physical fitness assessment of the home school students is a new field of research, there is a parity of empirical evidence to support or reject these findings.

Ray, compared the physical fitness of urban and tribal students of Agartala. Sixty male students from each age group ranged from 16 to 18 years were randomly selected as subjects. Data were obtained by administering the AAPHERD Youth Fitness Test and were statistically analyzed by using percentile scale. It was concluded that the performance of urban students in pull-ups.

Singh, constructed physical fitness norms for male teen agers of Jammu and Kashmir State. He used AAPHERD Physical Fitness Test to measure physical fitness that included pull-ups, bent knee, sit-ups, standing board jump, shuttle run, 50-meter dash, and 600 meter run/walk. This study concluded with the result that the subjects belonging to age group 16 to 19 years showed better performance on all the test items over the other age group 13 to 15 years. On the average physical fitness improved linearly according to age. Percentile scale, Hull scale and T-scale were also prepared for each age group separately.

Tuteja, conducted a study to find out the comparison of physical fitness of rural and urban from school students of Delhi. The subjects were 100 male students from rural and 100 male students from urban area of high school of Delhi. The age of the subjects ranged from 14 to 17 years. AAHPERD Youth Fitness Test was administered to obtain the physical fitness levels of the subjects. The raw scores from AAHPERD Youth Fitness Test were statistically treated and ‘t’ scale was computed for the test items of both the tests. It was found that in AAHPERD Youth Fitness Test the mean of the urban high school students was higher than that of the rural area students, whereas mean of the rural high school students was slightly higher than that

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of the high school students. It was also found that there was no significant difference in the physical fitness level of rural and urban high school students of Delhi.

Veerawami\textsuperscript{27}, conducted a study to find out physical fitness norms for Higher Secondary School of Greater Gwalior (M.P.). 212 male students from four higher secondary schools and 793 male students from remaining 23 schools were selected and AAHPERD Youth Fitness Test was administered on them respectively. The percentile norms for each test items were prepared for the boys of age group 13 to 17 years. It was also concluded that in all items except pull-ups of the AAHPERD Youth Fitness Test, the mean scores of Indian boys in all age groups were lower than the 50\textsuperscript{th} percentile of Americans norms. There was a positive but low order of relationship between physical fitness and participation in physical activities. There was a positive correlation though low ($r=.113$) between physical fitness and participation in physical activities. There was a positive correlation though low ($r=.113$) between physical fitness and academic achievement.

Rasmussen\textsuperscript{28}, conducted the study in South Dakota high school activities association. For this study one school was selected to represent each region or section, the number selected from each school was in proportion to the school enrollment. The AAHPERD Youth Fitness Test was administered to 1000 South Dakota Boys in grade 7 through 10. Norms were established by computing every fifth percentile. The scores of South Dakota boys were compared with those of National boys using age only. He found that the median scores of South Dakota boys at all ages were higher than those of National boys on all items except the pull-ups, the shuttle run, and the 50-yard dash.

Taddvio\textsuperscript{29}, constructed national norms based on the 1975 National Survey of Youth Fitness. The measure physical fitness was the AAHPERD Youth Fitness Test. Twelve school districts participated in the study point which 75 schools, 146

\textsuperscript{26} B.M. Veeraswami, "A Normative Study of the Youth Physical Fitness Test for Boys in Grades Nine through Eleven in Greater Gwalior," \textit{Unpublished Master's Dissertations}, Jiwaji University, Gwalior, 1993.

\textsuperscript{27} Glen L. Rasmussen, "Normative Study of AAHPERD Youth Fitness Test for Boys in Grade Seventh through Ten in the State of South Dakota," \textit{Completed Research for Health, Physical Education and Recreation IX} (1990), P. 207.

classrooms and 779 students were selected. The study concluded that (1) there was no
difference in the physical fitness of boys and girls and girls represented by the 1975
national norms and (2) within the sample, there was no different in physical fitness of
boys and girls from high poverty areas and boys and girls from low poverty areas.

Box30, prepared percentile norms tables for selected measures of strength,
power, agility, flexibility, and body composition. Cardio-vascular and muscular
endurance from data collected in five schools of the unity Christians school system of
muscles on vile.

Richerson31, studied the relationship of several physical fitness variable in
College (100 fourth grade) boys and girl data on the following variables were
collected, age, weight, height, leg strength, body movement, time 50 yards dash,
shuttle run, and standing broad jump. The mean scores on AAHPER Test items were
compared on National norms. Several significant correlation's were found the light
being weight with leg strength (46) leg strength with shuttle run (35) and leg strength
with 50 yards dash (.86).

Poulse32, compared the performance of elementary - school children in
selected fundamental skills arid found that the level of every subsequent class was
higher than the preceding class. All grade three and four were significantly superior to
girls grade three and four in standing board jump. It was also found that boys of grade
five were significantly superior to the girls of the same grade in 50- meter run and
shuttle run.

Lee33, employed the AAHPER Fitness test to evaluate the motor fitness of a
selected group of institute boys and girls over a period of two years. Result of the
study disclosed that the girls who participated in Physical education throughout the

29 David L. Box, "Physical Ability Testing of Male Students in Grades Four Through Twelve",
Completed Research in Health, Physical Education and Recreation 9 (1990), P. 77.
30 Harold V. Richerson, "The Relationship of Physical Fitness Variables in Selected Elementary School
Children," Completed Research in Health Physical Education and Recreation 10 (1988), P. 76.
31 T.M. Poulse, "Comparison of Performance of Elementary School Children in Selected
Fundamental Skills," Completed Research in Health Physical Education and Recreation: 24,
(1997), P. 91.
32 Rpnert G. Lee, "Motor Fitness Level of Senior High School Boys and Girls in a Rural
study were significantly superior to the girls who participated only during the initial year. Athletes (boys) were superior in all respects of fitness to non-athletes throughout the two year study. A noticeable increase in motor fitness occurred during the institute year in all group with no change in performance level over the summer months.

Loygherey and James\textsuperscript{34}, conducted the study to determine whether the AAHPER pull-up test or the reserve grip pull-up test, on the basis of the correlation with the Meloy strength score, was the better indicator of upper body strength and should therefore be included in a physical fitness test battery. Seventh and eighth grade boys (N=95) served as Ss. It was recommended that the one-minute sit-up test should replace the AAHPER sit-up test in the physical fitness test battery: the no blanks shuttle run test should replace the AAHPER shuttle run test in a physical fitness test battery; more studies need to be undertake to find a test which adequately measures arm strength to be included in a physical fitness test battery; and further testing should be undertaken to determine whether the AAHPER 600 yards run walk test or the 300 yards run walk test, on the basis of the correlation with the one-minute squat thrusts test, is the better indicator of endurance and should be included in a physical fitness test battery.

Funk, James\textsuperscript{35}, compared physical fitness levels of 7\textsuperscript{th} and 8\textsuperscript{th} grade athletes with non-athletes 199 boys were tested. An athlete was one who participated in interscholastic sports, and a non-athlete was one who did not participate in any organized athletics. Fitness level in this study was determined by scores on the 6 test items of the AAHPER Youth Fitness Test. The Fitness test was administered to both groups at the beginning of their 7\textsuperscript{th} grade year and again at the end of 8\textsuperscript{th} grade. Comparisons were made between athletes (n=94) and non-athletes (n=105), using their 7\textsuperscript{th} grade fitne4ss scores and also using their 8\textsuperscript{th} grade scores. Within group comparisons were made for each group by comparing the initial test scores with the final scores. The Behrens-fishter t test was used to compare the 2 groups. Significant

\textsuperscript{33} Loughrey, Thomas James, "A Comparison Between Result Achieved in Selected Physical Fitness Test and Results Achieved in Modifications of the Selected Tests" \textit{Completed Research in Health, Physical Education and Recreation}, 1989, P.90.

\textsuperscript{34} Funk, James F, "A Comparison of Physical Fitness Levels of Athletes and Non-Athletes in a Selected Intermediate School in New Jersey", \textit{Completed Research in Health Physical Education and Research}, 2001, P. 231.
differences were found on all 6-test items between athletes and non-athletes at both the 7th and 8th grade levels. These differences showed that the athletes scored higher than the non-athletes. The within group comparisons were made using Fisher's Matched-Pairs t test. Positive significant differences at the 0.05 level were found within both groups between the initial test and the final test scores.

Thomas Edward Shievers36, conducted a comparative study in wrestling and soccer team with regard to physical fitness and cardiovascular endurance the subjects were in required physical education classes at university of Florida wrestling and contributed endurance but neither sports appeared superior to other there for total number duration of the soccer training the above points should be kept in mind by the coach for better performance should be kept in mind.

Respiratory endurance of soccer and basketball player on the basis of soccer and basketball player on the basis of analysis of data the following conclusion were drawn the basketball player were comparatively superior to football player in extending flexibility and dynamic, flexibility the soccer player were found to be higher in key explosive strength, abdominal strengths, and gross body weight respiratory endurance of soccer and basketball players on the basis of analysis of data the following conclusion were drawn the basketball player were comparatively superior to.

Jennet W. Chair37, divided 100 male students into two ‘groups of 50 each, athletes and non-athletes. The athletes con of ten each basketball, gymnastics, basketball player, football linemen and football backs. Twenty-five tests were administered to each subject. The finding indicated that performance on agility test were accounted for in past, by reaction times, speed of movement, strength, balance and body size and form. A significant difference was found between the mean score for the various groups of athletes.

Harbin, conducted a study on differences in the Physical fitness levels between home school and public school students were investigated. The presidents challenge physical fitness and sports test battery was used to measure the physical fitness levels the statistical analysis indicated that the home school students were significantly more physically r than the public school students in the areas of upper body strength and endurance, flexibility and cardiovascular endurance. There was no significance difference in abdominal strength and endurance between home school and public school students’ comparisons made with the state scores revealed that students from south Alabama scores higher than the public school students across the state of Alabama, with the exception of upper body strength and endurance and cardiovascular endurance for format 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, 39% of the male public students and 35% of the female public school students scored above the 50 percentiles. Since a field of research, there is a paucity of empirical evidence to support or reject these findings.

Elizabeth, prepared percentile norms for girl’s age 12 to 15 years on the North Carolina American Alliance for Health, Physical Education and Recreation (AAHPER) Test. The norms were prepared for each of the fire test items; sit-ups, side stepping, standing broad jump, modified Pull-ups and squat thrust. The sit ups item provided effective differentiation on the presents scale for each category.

Thirupatthi, Computed physical fitness norms for boys of the Junior colleges in Solarpur district, 20 boys of XI and XII Class selected randomly from fifteen Junior colleges, were taken as subjects for this study. American Alliance Health, Physical Education and Recreation Youth Fitness Test was administered on them. The two scales validity t scale and Hull scale were constructed for the combined sample of the Junior College which were employed separately for XI and XII classes.

38 Francis Elizabeth, "North Carolina Associated for Health, Physical Education and Recreation, Physical Fitness Percentile Norms for Girls Age 12, 13, 14 and 15 years "Research Quarterly" 14, 1982, P.85.
Boone\textsuperscript{41}, administered the AAPHPER Youth Fitness test to 100 rural and 100 urban boys. The urban boys were superior to the rural boys and the difference will be significant at the .01 level. The two samples were weaker on the same components of physical fitness.

Craig\textsuperscript{42}, compared the physical fitness level of Canadian and South African school boys. He used AAHPER Physical Test battery. The result showed that physical fitness levels of South African high school boys are higher than those of Canadian high school boys.

Johanson\textsuperscript{43}, carried out the study to gain an understanding of the inter-relationship between a student’s levels of physical fitness. A further purpose will be to determine if Negro students definite significantly in terms of physical fitness and self concept from white boys in strength, cardio vascular endurance, and state of health, physical appearance, skills and sexuality. A greater relationship between physical fitness and self-concept will be found among whites than among Negro high school students.

Ponthieux and Barker\textsuperscript{44}, found fifth and sixth grade Negro boys superior to white boys of the same grade levels in five of the seven items of AAHPER test. Negro girls surpassed white girls on four of the seven items. The white girls surpassed the Negros on two, and there were no significant differences in the girls performance on the one remaining test.

Singh\textsuperscript{45}, constructed physical fitness norms for four thousand male students belonging to pre-university classes of Punjab University, Chandigarh, Flishman’s Physical Fitness Battery was administered on them. The three scales namely – Percentile scale Hull scale and T-scale were prepared. It was also concluded that physical fitness improved linearly with age and the students belonging to rural areas

\textsuperscript{40} Herman Boome, "A Comparison of Physical Level of Urban and Rural Boys" \textit{Completed Research in Health, Physical Education and Recreation} 10 (1987), P. 80.
\textsuperscript{43} N.A. Ponthieux and D.G. Barker, "Relationship Between Race and Physical Fitness," \textit{Research Quarterly} :36, December, 1969, P. 470
were significantly superior in their performance when compared to the students of urban areas.

Humphrey\textsuperscript{46}, conducted a comparative study to investigate the physical fitness level of third grade pupils taught by specialists and 100 non specialists were selected randomly from 20 schools in Greenlay, Colorado. The AAHPERD Youth Fitness Test was administered. The test consists of the items: sit-ups, sit and reach, skin-fold measurement and one mile run/walk. The t-test was used to compare the two group i.e. subject taught by specialists and those taught by non-specialists. The result indicated that the male specialists scored significantly higher on the sit-ups, sit and reach skin-fold measurement and one mile run/walk than non-specialists male. The specialist female scored significantly higher on the skinfold measurement than the non specialist’s female.

Taddnio\textsuperscript{47}, constructed national norms based on the 1975 National Survey of Youth Fitness. The measure of physical fitness was AAHPERD Youth Fitness Test. Twelve school district participated in the study from which 75 schools, 146 classrooms and 779 students were selected. The study concluded that (1) there was no difference in the physical fitness of boys and girls from the economically deprived sample and boys and girls represented by the 1975 National norms and (2) within the sample there was no difference in physical fitness of boys and girls from higher poverty areas and boys and girls from low poverty areas.

Lenhard et al\textsuperscript{48}, investigated the health related fitness levels of elementary school children aged 5-9. Three thousand elementary school students from the state of Miamme were assessed on their current physical fitness by using AAHPERD Health Related Fitness Test. These students scored higher than the national norms in these

\textsuperscript{46} Dominick Anthony Taddino, "A Comparison of Physical Fitness of Public School Students from Economically Deprived Areas with National Norms" \textit{Dissertation Abstract International}, (December 1982); 1878-A.
items such as sit-ups, sit and search and one mile walk/run test. However their skin fold thickness measurements were significantly large.

Andres\textsuperscript{49}, conducted study of physical fitness norms for South African boys and prepared their physical fitness level, which was compared with that of Canadian boys. He administered AAHPERD Physical Fitness Battery (1966). The mean score of the South African and Canadian boys were compared. The South African boys performed better than the Canadian boys did significantly.

Ross\textsuperscript{50}, selected the LOWA Motor Fitness test and the AAHPER Youth Fitness test to determine the change in physical fitness of Junior and senior girls, after two semesters of physical education and after a period with no formal physical education significant gains occurred in abdominal strength, explosive power, co-ordination, flexibility and speed during the semester of Physical education but a significant loss in physical fitness was noted following the period of non-participation.

Nandurkar, Prakash V.\textsuperscript{51}, conducted a study to compare and generalize the physical fitness of B.P.Ed. students of Nandurkar College and B.Ed. students of Jijau College of Vavatmal city. Thirty students from each course between the age group of 22 to 28 years were selected from the Nandurakar College of Physical Education and Jijau B.Ed. College of Yavatmal and their Physical Fitness was measured by AAHPER Youth Fitness Test. It was concluded that the Physical Fitness level of B.P.Ed. College students were found significantly superior in comparison to the students of B.Ed. College.

\textsuperscript{50} Truel George, "The Effect of An Accelerated Physical Conditioning Programme on Athletes on Non-athletes at St. Edward High School", \textit{Completed Research in Health Physical Education and Recreation} 5, 1980, P.123.
CHAPTER III
METHODOLOGY

3.1 Selection of the Subjects
3.2 Selection of the Variables
3.3 Procedure for Collection of Data
3.4 Criterion Measures
3.5 Instrumental Reliability Administration of Test
3.6 Administration of the Test Items
3.7 Tester Reliability
CHAPTER-III
METODOLOGY

In this chapter the procedure and methodology adopted for the selection of the subjects, selection of the variables procedure and collection of data, criterion measures instrument reliability and administration of the test, items description of various test items and the statistical techniques used for analyzing the data have been explained.

3.1 SELECTION OF THE SUBJECTS:

This chapter deals with the methodology and procedure to conduct the present research work. This chapter also explains about the steps, how the investigator have the proceeded for present study. In this chapter the selection of subjects, relation of the variables, criterion measures, administration and procedure of test item wise explained in detail stepwise, which were described as follows:

The 559 subjects for the present study were selected from different universities and different colleges of northern part of India. The subjects were selected of five games e.g. Basketball, Cricket, Football, Hockey and Kabaddi. The students, those who were participated in North Zone Inter University tournaments 2009-10, were selected as subject for the present study.

As the main emphasis of the present study was laid down on general physical fitness. So the students who have participated in these respective inter-university tournament. Total ten universities were selected from the northern part of India. Therefore five games participated were selected. Total 559 five hundred and fifty nine students were finally selected.
3.2 SELECTION OF THE VARIABLES

For the purpose of present study, AAPHERD Youth Physical Fitness Test Battery consist of six testing components were selected. The following test items of the battery have been considered on the variables for the present study.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Test items</th>
<th>Elements Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pull-ups</td>
<td>Muscular strength</td>
</tr>
<tr>
<td>2.</td>
<td>Bent Knee Sit-ups</td>
<td>Muscular Strength of trunk</td>
</tr>
<tr>
<td>3.</td>
<td>Shuttle Run</td>
<td>Agility</td>
</tr>
<tr>
<td>4.</td>
<td>Standing Broad Jump</td>
<td>Explosive Strength</td>
</tr>
<tr>
<td>5.</td>
<td>50 Yard Dash/Sprint</td>
<td>Speed</td>
</tr>
<tr>
<td>6.</td>
<td>12 Minutes Run/Walk</td>
<td>Cardiovascular Endurance</td>
</tr>
</tbody>
</table>

3.3 PROCEDURE FOR COLLECTION OF DATA

The purpose of conducting the investigation, the detail related to the test items were so that voluntary participation of the subjects could be able to associate the quarries were also cleared and the variables feedback was also observed before the conduct of the test items. The subjects were agreed to undergo to data collection procedure for physical fitness, as specified by the research scholar. The subjects were also enthusiastic in known their own best performance of physical status. No specific technique was used to motivate the subjects to put their best efforts.

AAPHERD Youth Physical Fitness Test Battery. The tests items were conduct in the open field area and indoor area, according to the requirement placement of the testing station. The tests were conducted during the regular schedule time of the college. The schedule was prepared according to their engagement and free time within the time table so that the subjects were participated with free mind and full enthusiasm to their best performance.
The research scholar also took the help of his college mates to coordinate and conduct the various tests for the purpose of data collection.

### 3.4 CRITERION MEASURES

The criterion measures were used to collect the data in an ideal and systematic manner which were used to record in a correct unit and style for the following test items.

1. **Pull-ups:** Dynamic muscular strength of subject was measured by Pull-ups test items, the score were recorded in the number performance maximum to one minute.

2. **Sit Ups:** It is measure muscular strength and endurance (for abdomen) bent knees sit ups. The scores were recorded in the number performance maximum to one minute time.

3. **Shuttle Run:** It is measure the speed and agility and recorded in the 1/10 of a second with the help of digital stop watch.

4. **Standing Broad Jump:** It is measure the explosive leg strength and score recorded in the Feet & Inches.

5. **50 Yard Dash:** It is measure the speed and was recorded to the nearest 1/10<sup>th</sup> of a second with the help of stop watch.

6. **12 minutes Run Walk:** It is measure the cardiovascular endurance. The subjects were asked to cover the maximum distance in time and time is measured in minutes with the help of stop watch.

The instrument involved in the measurement of there was simple and were easily available.
### TABLE: 3.02

**DESCRIPTION OF MEASURING UNIT REQUIRED FOR TESTING PHYSICAL FITNESS COMPONENTS**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Test items</th>
<th>Measuring Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pull-ups</td>
<td>In Numbers</td>
</tr>
<tr>
<td>2.</td>
<td>Bent Knee Sit-ups</td>
<td>In Numbers</td>
</tr>
<tr>
<td>3.</td>
<td>Shuttle Run</td>
<td>In Seconds</td>
</tr>
<tr>
<td>4.</td>
<td>Standing Broad Jump</td>
<td>In Feets</td>
</tr>
<tr>
<td>5.</td>
<td>50 Yard dash/Sprint</td>
<td>In Seconds</td>
</tr>
<tr>
<td>6.</td>
<td>12 minutes run/Walk</td>
<td>In Meters</td>
</tr>
</tbody>
</table>

### 3.5 INSTRUMENTAL RELIABILITY

The following description of the creation measures are as follow: During the present study the following instruments/ devices/ equipments/ were used.

1. Digital Stop Watch
2. Clapper
3. Whistle (fox-40)
4. Measuring Tape
5. Horizontal Bar.

There above mentioned equipments were also utilized in the laboratory of the institute and in the field of teaching and testing experiments and different sports activities. These equipments were of high standard.

### 3.6 ADMINISTRATION OF THE TEST ITEMS

The performance of various test items were demonstrated by the investigator himself as the subjects belonged to physical education institute. They were aware of test items. The test was administered as below:
1. Pull-ups

**FIGURE:  3.01**

**Test Objective:** To measure arm and shoulder girdle strength.

**Test Area:** For the Pull-ups Test, the manual suggests that only space adequate for the equipment is needed.

**Equipment:** Metal or wooden bar roughly 1½ inches in diameter (alternatives are a door away gym bar, a piece of pipe or an inclined odder).

**Description:** To perform the pull-ups Test, the student begins by hanging from the bar by using an overhand (palms outward) grip (see Figure 1) with his legs and arms fully extended. The feet should not contact the floor. From the hanging position, the student raises his body using his arms until his chin is positioned over the bar. He then lowers his body to a full hang, the starting position. This task is repeated as many times as possible. One trial is allowed.

**Scoring:** The score for the Pull-Ups Test is the number of pull-ups to the nearest whole number.
2. Bent Knee Sit-ups

![Image of Bent Knee Sit-ups on a mat]

**FIGURE: 3.02**

**Test Objective:** The sit-ups test is used to measure abdominal strength and endurance.

**Test Area:** Adequate space for lying position/indoor.

**Equipment:** Stop watch.

**Description:** The starting position of the test is a back lying position with knees flexed feet on floor and heels between 18 and 20 inches from the buttocks. The hands interlocked each other behind the head. A partner holds the examinee’s feet to keep them in contact with the testing surface. The examinee curls to a sitting position, maintaining the hand behind the head. The chin should be tucked on the chest and should remain in this position until the completion of the sit up. The examinee curls back down to the floor until the mid back contact the testing surface.

The student begins executing consecutive sit ups on the word ‘Go’ using the signal Ready ‘Go’. At the end of 60 seconds, the test is ended with the word stop the score is the number of sit ups executed correctly during this time. Pausing between sit ups is permissible.
3. **Shuttle Run Test**

![Figure 3.03]

**Test Objective:** To measure speed and change of direction.

**Test Area:** An area equivalent to the width of a volleyball court is suitable.

**Equipment:** Two blocks of wood, 2 inches by 2 inches by 4 inches and a stop watch. If two stopwatches are available or one with a split second timer, two students can be tested at the same time.

**Description:** For the Shuttle Run Test place two parallel lines on the floor 30 feet apart. Place two wooden blocks behind one of the lines as shown in Figure 2. The student starts from behind the other line. To start the test, use the signal Ready, ‘Go’. On the word ‘Go’ the student runs to the blocks, picks one up runs back to the starting line, and places the block on the floor beyond the line. The student turns and runs back, picks up the other block, and run across the finish line as fast as possible. Start the stopwatch on the signal ‘Go’ and stop it as the student crosses the starting line. Two trials are administered with a rest in between.

**Scoring:** The time of the better two trials, recorded to the nearest tenth of a second, is the score.
4. Standing Broad Jump

**FIGURE: 3.04**

**Test Objective:** To measure explosive leg power.

**Test Area:** The jump may be tested in an outdoor jumping pit.

**Equipment:** Measuring tape.

**Description:** In the standing Long Jump Test the student behind the take-off line, with feet several inches apart and the toes pointed straight ahead, as shown in figure 3. To get ready for the jump the examinee should swing the arms backward and bend the knees. To execute the jump the student should swing the arms forward, extend the knees, and jump forward as fast as possible, attempting to land on the feet and fall forward instead of backward if balance is lost. Three trials are taken.

**Scoring:** Measure the distance from the take-off line to the heel or other part of the body that touched the floor closest to the take-off line. If the student falls backward and touches the testing surface with the hand, the distance is measured from the part of the hand closest to the take-off line to the line itself. Record the best of three trials in feet and inches to the nearest inch.
5. 50 Yard Dash/Sprint

**Test Objective:** To measure speed.

**Test Area:** Usually administered outdoors, using any open area.

**Equipment:** One stopwatch is essential using two watches or a split second timer for simultaneous testing of two students is recommended.

**Description:** For the 50 Yard Dash Test the student assumes a standing start position behind the starting line. On the command ‘Are you ready? and Go, the student runs as fast as possible, without slowing down until he or she crosses the finish line (see Figure 4). The stopwatch is started as the command Go is given and is stopped as the finish line is crossed.

**Scoring:** Record the time in seconds to the nearest tenth of a second.
6. **12 minutes Run/Walk**

**Test Objective:** To measure cardio respiratory (CR) function.

**Test Area:** A variety of open spaces is suitable. See the examples presented in Figures to 5.

**Equipment:** A stopwatch.

**Description:** Instruct the student to use a standing start. Give the signal Ready, Go and start the stopwatch on the signal Go. The student begins running and continues running as fast as possible until he or she crosses the finish line. Although the examinee may walk during the test, it is not encouraged. One trial is taken.

**Scoring:** The time is recorded in minutes and seconds.
3.7 TESTER’S RELIABILITY

To ensure that the investigator was well versed with the techniques of conducting the test, the investigator had a number of practice session in testing procedure under the guidelines of Dr. Rakesh Gupta, Associate Professor in Physical Education, Delhi University. All the measurements were taken by the investigator with the assistance of Master Degree Student of Delhi University.