Chapter II

REVIEW OF RELATED LITERATURE

In the process of current research investigations sincere attempts were made to broaden the horizon of knowledge by going through the various sources of literature and acquainting oneself with various conclusions about the performance level and standard of physical fitness. A few studies have been undertaken with regard to the development of physical education and sports in the State of Jammu & Kashmir. Research studies will help to provide pragmatic help for the upliftment of the sports standard in the state. Not much literature was available on Motor ability and Physical Fitness, however, the research scholar went through the related available literature and relevant studies found are enumerated here with.

Manroé \(^1\) made a study on physical fitness and motor ability to find out difference between selected freshman women enrolled in College Dance Classes. Three item Scott Motor ability test-battery and two item Scott Physical Education Test battery were administered to conduct the tests of 100 freshmen women before and after the fall of semester of 1960-1961 at Madison College

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(Verginia) during which the subjects had four weeks fundamental movement, four weeks of roll dance and eight weeks of modern dance. The results showed that the women improved in motor ability and physical fitness but showed greater improvement in motor ability than physical fitness.

Chalerm² made a study on physical fitness, the purpose of the study was to find out the levels of physical fitness Oklahoma State University faculty group (N = 62) with those of the commercial subjects (N = 308) who were tested in the mobile lab. programme in a sub-problem were to compare the physical fitness levels of the following: all tested males in various age groups between male and females who were tested in the mobile lab programme, males and females in various age groups, various professional groups and the test and retest result on 64 mobile lab subjects who were re-evaluated during the year of this study. Comparison were made on the following: Weekly aerobic points total, lying blood pressure, lying pulse rate, present body fat, respiratory functions, Ekg. Predicted maximum O₂ intake strength tests reaction time tests flexibility and O₂ saturation. The data was treated with the SAS computer programme. Results and conclusions shows the most of the scores of the physiological variables

of males of the Oklahoma State University faculty were better than those of in the commercial males. As the mean age increased one year, all tested males showed some decreased in the physiological variables. Most of the physiological variables of males were better than those of females in the commercial group. As the mean age increased one year, males and females in the commercial group showed some decrease in the physiological variables.

A study was conducted by Blaylock\(^3\) on relationship of schools and colleges ability test scores. Barrow Motor Ability Test scores were ascertained for 100 old boys of 16 and 17 years age group, and the scores of the former including the quantitative and verbal tests were correlated with the barrow test and each of its test items. None of the correlation coefficient ability test was significant (\(P > 0.5\)).

Barbante\(^4\) made a study on Brazilian boys and girls. The purpose of this investigation was to determine the status of physical fitness of selected Brazilian boys and girls and to provide norms for Brazilian school children from the scores achieved


on selected physical fitness tests. And to find out difference
between performance of Brazilian boys and girls and to determine
if difference existed between norms for Brazilian and American
boys and girls for selected physical fitness measurements. 342
boys and girls were taken as subjects who were enrolled in a
public school system in Brazil during 1982 year. Results of the
study could be summarized as follows: 1) For selected Brazilian
school populations age group from 6 to 14 years, height and weight
of both sexes increased at approximately at the same rate. Girls
were significantly taller and heavier than boys during adolescence.
2) Brazilian girls had higher values than boys for triceps and
sub-scapular skinfold measurements, sit-ups and in reach test.
3) Brazilian boys performed better than Brazilian girls in modified
sit-ups tests, nine minute run test, 12 minute test, 50 meter
dash test and standing long jump test. 4) The comparison between
norms for Brazilian and American boys and girls showed that Ameri-
can boys and girls in general were taller and heavier and had
a higher scores in standing long jump.

Morrow\textsuperscript{5} conducted a study on Korean Secondary students

\textsuperscript{5}James R. Morrow, "A Comparison of the Secondary Korean
Students Physical Fitness Test Scores in 1979 and 1986," Dissertation
of physical fitness. The purpose of this study was to compare 1979 KSPFT and 1986 KSPFT results and to see if change is occurring. Analysis of the data supports the following conclusions - (1) A significant difference between grade level was found between the boys and girls with the 12th grade students. Scoring better on most items of the KSPFT, with the girls there was mixed performance between 9th and 12th grades. (2) A significant difference in gender was found on all the KSPFT items. (3) A significant difference in year was found between all 1979 group and 1986 group. The 1986 group in the distance throwing and pull ups and flexed arm hang for girls. (4) A significant grade gender interaction was found in sit-ups, standing long jump, 100 m. run and distance throwing. (5) A significant grade by year interaction was found in the distance throwing and 800 meter run/walk. (6) A significant gender by year interaction was found in the standing broad jump and sit-ups. (7) No significant grade by gender year interaction was found in the KSPFT items.

Beam⁶ made a study in comparison of motor ability of females with older siblings over six years of physical growth. The purpose of the study was to determine whether motor ability

of female subjects was related to the presence or absence of an older sibling and to determine if a girl maintain her motor ability rank within a group of classmates through out six years of time on motor ability test items recommended by researchers; in the area of physical education, sub-purpose were to attempt to isolate factors which appeared to show relationship to the motor development of females, twelve through eighteen years old and to attempt to determine the nature of the variables related to motor ability. The results of this study shows: (1) that there was a high positive correlation in the motor ability rank and position.

Huntly⁷ made a study on physical fitness and motor ability to find out the effect of these selected physical activities on 1961 subjects selected at random from first, second and third grade students, who were involved in this study. Out of the three experimental groups within each grade. An analysis of the results revealed that both physical fitness and motor ability attributes, excluding body reaction time can be significantly improved by structured physical education programmes consisting of basic

movement and rhythmic activities, games and gymnastics. It was further found that the greater contribution of physical fitness and motor ability resulted in group participation in basic movement and rhythmic ability. The best contribution to physical fitness and motor ability resulted from participation in games and related activities.

Jack⁸ made a study and had taken 3549 students as subjects who were tested and, thus results obtained. It is clear from the results that the accuracy of a predictor from a regression equator depends upon the size of the error of estimates as well as the fitness of the units of measurements.

In all six models developed, the multiple R's (19593.47470) were significant at the .01 level of confidence but their efficiency of prediction were low. The study did provide a range in which 99 out of 100 fail.

Hill⁹ made a study taking 133 male and 133 female subjects between 5 and 8 years of age. The data shows the following

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findings:

Both reaction time and movement time decreased significantly with increasing age. Both of those functions were significantly related to each item of the physical fitness tests. Both correlated significantly with the motor ability criterion, but however, in combination with other variabilities considered they had no value in the prediction of motor ability.

The study made by Remi\textsuperscript{10} which included sub-problem also, an analysis of the nature and extent of difference if any in the factor structure in physical fitness of children of 7 and 8 years with that of children 11 and 12 years of age. The findings clearly indicated a well defined structure of physical fitness for elementary school boys. The factor structure is highly similar for both age groups and similar to adult physical fitness components.

Worth\textsuperscript{11} who studied the problem of comparison of motor ability of mentally retarded children of specific chronological


ages and normal children. Subjects for the study were obtained from two north Georgia School systems. All subjects were either enrolled in an educable mentally retarded special class or regular third, fourth and fifth grades. Results indicate that in motor performance the mentally retarded and intellectually normal groups of subjects were significantly different from one another. Further analysis indicated that the performance of the mentally retarded male subjects were significantly higher than that of the intellectually normal subjects, where the performance of the mentally retarded chronological age subjects were significantly below that of the intellectual normal subjects.

Bruce\textsuperscript{12} made statistical comparison through the use of Awora and Hanova (MB x 67) procedure at the University of New Mexico Computer Centre. In his study correlations were made by using the computer centre and BMDO2. A programme in his study was the effect of two specific adopted physical education programmes as negative attitudes towards physical education, physical fitness and motor skill development.

The results which show .05 level of confidence were accepted on critical value to indicate significant difference. Attitude

towards physical education improved within the CCS (.01). There was no significant difference between the two EG's and their improvement attitudes towards physical education (.01). Motor skills achievement level improved within all groups with EGI showing statistically significant difference (.01). There was significant correlation between the improvement of motor skills achievement and improved attitude of physical education differences over the CG's.

Daniel\textsuperscript{13} has taken 115 male college freshmen Caucasian and Negro who were enrolled in fresh physical education programme at Lincoln University. The following conclusions were drawn on the basis of his findings.

1. Physical fitness programme was not significantly different from the sports programme. This produced changes in self concept of the college students.

2. Students who experienced physical fitness programme and the sports programme were not different in self concept changes from those students who did not experience those programmes.

3. There were no relationship between changes of self concept of the two different races Caucasian and Negro and

the type of programme they experienced.

4. The physical fitness programme was not significantly different from the sports programme in providing changes in self concept of the junior and senior high school students.

The forty two subjects who participated in the study ranged in age from 18 to 24 years. The subjects were randomly assigned to three groups - one control group, and two experimental groups. It was indicated in the results obtained from his study that insignificant improvements in resting diastolic blood pressure and physical fitness index, submaximal minute volume ventilated/kg, body weight and resting pulse pressure produced noticeable changes but were not significant. There were no significant differences between the two exercise programmes for any of the four tests. Consequently, training at seventy-five per cent of the difference between resting and maximum heart rate four times per week, ten minutes per day, or two times per week, twenty minutes per day was training stimulus that was adequate to cause improvement in cardio-vascular characteristics and physical fitness measures.14

14 Raymond Lee Worshan, "The Effect of Training Frequencies Upon Selected Physical Fitness Measures in Colleges," Dissertation Abstracts International 40 (October 1979) : 1012-A.
Brogdon\textsuperscript{15} undertook a study on comparing certain physical fitness and anthropometric measures for early adolescent Mexican American and Anglo American males. The findings revealed significant difference between the Mexican American and Anglo-American males in certain physical fitness items and anthropometric measures. The Anglo-American males were superior in performance of sit-ups and the standing broad jump. The findings also revealed significantly large anthropometric measures for Anglo-American male in all, but four measurements; these were -hip width, shoulder width, waist girth, and chest girth. The relationship between selected anthropometric measures and various physical fitness test items were significantly higher for the Maxican-American male.

Blesh\textsuperscript{16} undertook a study on Ten Years Survey of Physical Fitness Tests at Yale University. The purpose of his study was to determine the achievements of freshmen students at the University of Yale on six tests of physical fitness which were


administered as part of the regular programme of physical education. Data covered a period of ten years from 1947 to 1956. During this time, approximately 10,000 under-graduates were tested.

The test items were pull-ups, push-ups, fence vault, sit-ups, standing broad jump, and vertical jump. A final observation of these data clearly indicated that an individual's strength, agility, and co-ordination can be improved upon in a rather short period of time, when concentrated effort is made on that particular factor and the exercises are at regular intervals. This is revealed by the fact that nearly eighty per cent of the individuals who failed in one or more tests in the initial testing period were able to pass the six tests during the twelve week programme of three half-hour period per week.

Ghosh\(^\text{17}\) undertook a study to compare the relationship of academic achievement with physical fitness, motor fitness, and general motor ability of high school athletes and non-athletes. One hundred subjects were involved in that study: 50 male and 50 non-male athletes. AAHPER YouthFitness Test, Barrow Motor Ability Test were administered to measure fitness and general motor ability.

\(^{17}\)Dipti Kumar Ghosh, "Comparison of Relationship of Academic Achievement to Physical Fitness, Motor Fitness and General Motor Ability of High School Athletes and Non-athletes," (Unpublished Master's Thesis, Jiwaji University, 1980).
From the results of the study it was revealed that academic achievement does not have significant relationship with physical fitness, motor fitness, and general ability in cases of subjects studying in classes ninth, tenth, and eleventh of the Kendriya Vidyalaya, Gwalior. The score of academic achievement and physical fitness, motor fitness and general motor ability were separately compared for athletes and non-athletes, and in none of the cases the value of co-efficient of correlation obtained was found significant. All the values of coefficient of correlation for athletes and non-athletes were positively except in the case of correlation between academic achievement and physical fitness of athletes were negative values of 'r' was obtained.

Marriman\textsuperscript{18} made a study and took 808 boys from two school (Muscatme High School and Iowa City High School) and four other high schools in Iowa. The pull-ups JCR test (II) and the California psychological inventory (6) were administered to each subject at the beginning of the school year (1958-59). Four purpose of comparison, the subjects were classified as follows:

Upper and Lower motor ability groups (athletes and non-athletes) matched according to motor ability scores and participated in team and individual sports.

\textsuperscript{18}J. Burton Marriman, "Relationship of Personality Traits of Motor Ability," \textit{Research Quarterly} 3 (May 1970) : 108.
Few significant differences were found between mean CPI scores when the athletes and non-athletes were matched according to motor ability.

The results of this study indicated that the motor ability is related to personality traits.

Veerawasmi\textsuperscript{19} made a study to evolve physical fitness norms for boys of higher secondary schools of Greater Gwalior. AAHPER Physical Fitness Test battery was administered in this study. The results obtained show:

1. As per the norms for pull-ups, sit-ups, shuttle run, standing broad jump, 50 meter dash, soft ball throw, 600 meter run/walk, for boys, age group up to and including 13, 15, 16 and 17 and above, the mean scores of Indian boys in all age groups are lower than 50th percentile in the American norms.

2. There is positive but low order of relationship between physical fitness and participation in physical activities.

3. The physical fitness was found to be related to degrees of regularity in physical activities. The more the degree of regularity, the higher was the physical fitness score.

4. Physical fitness depended on the economic status of the subjects.

Barrow\textsuperscript{20} conducted study and conclusions were drawn. The purpose of the study was to determine an easily administered test for motor ability for college men. Expert opinion was used in the validation process and measuring those factors were chosen. The selected tests were administered to 222 college men and statistical analysis carried item reliability and objectivity correlation. The following test items were used:

1. Zig-zag run
2. Medicine ball put
3. Standing broad jump
4. 60 yard dash
5. Soft ball throw
6. Wall pass.

The standard motor ability rating was found.

Evelyn\textsuperscript{21} conducted a study and had taken 100 women


students as subjects measuring in elementary education and enrolled in physical education activity classes at University of California at Los Angeles. Each subject had given a subjective posture examination by three judges, experts in the area of adopted physical education. When the tests were administered it appeared that there is little or no relationship between postural divergencies. This was measured by the judges to check rating and motor ability for the subjects used in the study.

Tuteja\(^{22}\) made comparative study of physical fitness of rural and urban school students. The purpose of this study was to compare physical fitness, AAHPER physical fitness test items, pull-ups, sit-ups, shuttle run, standing broad jump, 50 metre dash, soft ball throw for distance, 600 meters run/walk and NPED 100 meters run. Two hundred subjects were involved from high schools of Delhi, both in rural as well as urban areas. The result showed:

1. There is no significant difference in the physical fitness level obtained from AAHPER Youth Fitness test between rural and urban high school students at Delhi.

2. There is no significant difference in physical fitness level obtained from NPED test between rural and urban high

schools of Delhi.


Walter made a study on the development of motor ability. 1723 boys aged from 9 to 23 were involved in this study. Those of ages 9 and 10 (graded 4 and 5) scored a little under 10 points with only slight improvement to age 10. From these to age 13 grade eight, there was a rapid mean increase to a little less than 13 points. Seventeen years of age, a less sharp, but consistent means increase occurred to about 15.5 score points. There was a slight drop from these to a plateau at a mean score of 14.5 points which persisted to age 22. A remarkably regular variability was observed through the entire range of performance.

These findings for boys upto 12 years of age support those of Espenschode. Espenschode study showed a steadier decreasing gain in girth performance copied to boys at age 9 to about 13 years. Brace test battery was utilized by Walter.

Millar made study on the comparison of the effects


of individual and team sports programmes on the motor ability of male college freshmen. Barrow motor ability test battery consisting of the items of zig-zag run, standing broad jump, medicine ball put, sixty yard dash, soft ball throw for distance and wall pass, were administered. Ninety subjects were involved in this study who were almost all athletes of international participation. Students who planned to receive instruction in any physical activity outside the physical education classes were provided for. The results showed that the individual sports had a significantly different effect only on the sixty-yard dash test item. The 't' test analysis indicated that the effect of bowling and tennis and effect of badminton and tennis were significantly different. The team sports had significantly different effect on the wall pass test item and 't' test analysis indicated that the effect of soccer and volleyball as well as the effect of volleyball and basketball were significantly different.

Landiss\(^{25}\) designed a study to compare eight selected physical education activities in their development of physical fitness and motor ability in the students participating in these activities. The criteria for determining these two factors of physical fitness

and motor ability were physical fitness test.

Larson Test for Motor Ability: The results of these data collected by holding those tests indicated that improved physical fitness rating was achieved in equal measure by those participating in conditioning and by those students who participated in tumbling gymnastics, etc. The activities least apt to increase the students score on the physical fitness test. It was further found from the study that the groups participating in wrestling and tumbling gymnastics made significant gain in the Larson tests of motor ability.

Roy\textsuperscript{26} made a study on comparison of physical fitness in tribal and urban students. 120 subjects were taken: 60 from urban, and 60 from rural areas. AAHPER Physical Fitness Test items included 50 yard dash, pull-ups, sit-ups, shuttle-run, standing broad jump, soft ball throw, 600 yard run-walk. The reliability of the performance of 120 subjects selected at random was computed for each test item of the AAHPER Youth Fitness Test by correlating the scores of first day with those of the third day. The analysis of the data clearly shows that there was no significant difference in the physical fitness of urban and tribal students

as calculated from the AAHPER test. Even though the mean of the urban students was higher than that of the tribal students. The mean difference was not found statistically significant at .05 level of confidence.

The purpose of the study made by Dorothy\textsuperscript{27} was to determine the effect of a year's physical education programme or the physical fitness achievement of junior high school girls. The instrument of measurement was New York State Physical Fitness Screening Test. The findings indicated that the girls improved in over all physical fitness and that the same girls fell below the average of the New York State Junior High School Girls.

Changed measured by Gary\textsuperscript{28} were anthropometric measurements of the arms, legs, chest and waist, motor ability as measured through the vertical jump and the standing broad jump and cardio-vascular efficiency on measurement by the resting and working heart rates of each individual. Girth measurement of each individual decreased in all areas of the body. Very little

\textsuperscript{27}High H. Dorothy, "Physical Fitness Achievement of Girls in the Alliance Nalraska City Junior High School," Completed Research in Health, Physical Education and Recreation 10 (1968): 22.

change occurred in jumping ability. Cross country endurance bicycling tended to decrease an individual's resting and working heart rates. The resting heart rate dropped 29.6 beats/minute and the working heart rate dropped 35 beats/minute.

A comparison was made by Thomasena\textsuperscript{29} of a 1966 and a 1967 administration of the Scott General Motor Ability Test scores for the women students in the class of 1970 at the University of North Carolina at Greensboro. The amount of change in the battery T-score was studied in relation to activity selections and attitudes. The increase group included those students whose total 't' score had improved 5 or more points. The scores had decreased five or more points for the other group. Changes in the battery score and for each of the three items were significant (P \( < .05 \)) with the exception of the obstacle race item. The attitude of both groups were similar and seemed not to have an effect on the two motor ability test scores. Activity selections were similar for the most part, but some few selections indicated a possibility of relationship to general motor ability scores.

The purpose of study made by Deshpande\textsuperscript{30} was to compare the effect of endurance running and free hand exercise on physical fitness and general motor ability. Thirty-two women BPE I year students were involved in this study. AAHPER Youth Fitness Test and Scott Motor Ability Test item was practiced. This study presented the following conclusions:

1. The physical fitness index of women students can not be improved significantly through training programme of endurance, running and free hand exercises.

2. General Motor Ability for women students cannot be improved significantly through a training programme of endurance running and free hand exercises.

The study made by Alexander\textsuperscript{31} was to ascertain the structure and nature of the factors which contribute to motor performance. In particular, the difference in the clustering of the variables of motor performance between men and women, majority in physical education was of concern. Ss (N = 103) female and


(N = 40) male students were enrolled in professional physical education at Murray State University. The oblique rotation procedure as well as four factor analysis models were used. A 34-item test battery was administered to each of the Ss solutions yielded six robust factors for the males and five robust for the females. The six robust females that existed in the domain for the male group were leg strength, speed, arm, and shoulder girdle strength, and endurance, arm explosive strength for projecting objects, basketball skill, muscular strength and endurance, and grip strength and finger speed. The five that existed for the female group were muscular endurance and agility, leg power, upper body explosive strength for propelling objects, balance, and static strength of the arms.

Kirk\(^{32}\) undertook the study of relationship between motor ability and self concept of fifth grade boys. The problem of this study was to determine whether there was significant difference between the self concept of 5th grade boys demonstrating low motor ability proficiency and those exhibiting higher motor ability proficiency. Motor proficiency was measured by a five item general motor ability test battery. The results were reported according

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to the few questions which have been answered.

1. The results indicated no significant difference between composite physical performance (GMA) scores and overall self concept.

2. A significant difference was indicated for the upper group standing broad jump (power) and the lower group shuttle run (agility) when compared to composite self concept.

3. One of the six variables, happiness and satisfaction proved to be significant at .05 level. The other five self concept variables were not significant.

4. The variables of grip strength (strength) approached significance when an F-ratio of 2.95. An F-value of 3.05 was needed for significance in analysing the interacting variables of the upper performance group.

5. An inter-action was observed between shuttle run and the upper stroke stand broad jump groups which was greater than that of the lower stroke stand and the upper shuttle run.

The three main purpose of the study made by Jamal was to establish national physical fitness norms in terms of every

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fifth percentile by gender age and gender/grade by administering the AAHPER Youth Fitness Test to 60502 or 8% of boys and girls ages 14 through 17 attending Public (Govt.) Schools grades 9 through 12 in the state of Kuwait, (b) compare the Kuwait data with those of high school boys and girls in the United States as indicated by their performance on the AAHPER Youth Fitness test. Survey of 1975 (c) compared the mean difference in physical fitness among three groups of boys and three groups of girls attending public schools in Kuwait.

The conclusion reveals that (l) the physical fitness status of boys and girls attending Public Secondary schools in Kuwait was significantly lower than that of their counter parts in America (2) the physical fitness levels of three groups of boys and girls in Kuwait public school differed significantly in certain companion General Kuwait male and female students in the credit unit system performed better their Kuwait and non-Kuwait counter parts in the general system.

A study was undertaken by Durrant,\textsuperscript{34} where after 7 weeks of similar classes, the Roger's strength test and national section on women's athletic test were given to 42 college women in-

\textsuperscript{34} Earlene, Durrant, "A Comparative Study of Physical Fitness of College Women, Physical Education Majors and College Women Enrolled in Service Class at Brigham Young University," Completed Research in Health, Physical Education and Recreation 7 (1963) : 39.
service courses and 42 women majors during 8th week. The Scott Motor Ability test was given during 10th week. The means for both the groups on the athletics and motor ability tests were above the norms. The difference between groups for strength and motor ability were not significantly superior in motor fitness as determined by the athletic test.

The purpose of this study made by Ignico\textsuperscript{35} was to determine and to compare fitness levels of children enrolled in daily and weekly physical education programmes. In addition to this age and gender effect were investigated. The most significant finding was that daily physical education participants scored significantly better on each health related to fitness items, across grade and gender. A comparison of these results to physical best fitness criterion indicated that the two schools centres led sharply. In summary these findings provided preliminary evidence that school physical education programmes can made a significant contributions to children's fitness levels. However, further investigation for examining large population is needed to support these findings. Although, physical education minutes alone can not overcome

fitness deficiencies. These findings provided strong support for quality to daily physical education in the elementary school.

In the light of these studies the research scholar selected Barrow Motor Ability, Morrison Motor Ability and AAHPER Youth Fitness Test Batteries for holding test of Motor Ability and Physical Fitness for 9th and 10th Class boys and girls. The detailed description are given in the Chapter III.