CHAPTER - II
REVIEW OF LITERATURE
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The related literature reviewed and collected from different sources has been presented in this chapter. Studies had been conducted to find out the effect of participation in physical activity as well as the effect of physical fitness programmes as curricular module. Further studies were conducted to prepare physical fitness norms to be used as an instrument for evaluation. Very many studies were conducted on health related physical fitness, from different angles. Studies were also conducted to find out the reason for poor physical fitness levels by analyzing the programmes of physical education in schools.

Hirchland examined the American School children on a battery of six muscular-strength tests which represented minimum fitness level of strength and flexibility, in certain key muscular groups, below which functioning of the whole body as a healthy organism seemed endangered. The percentage of failure was 57.9%.

Kirchner conducted a study on elementary school children with the Kraus Weber test of minimum muscular fitness and compared the finding with other geographical surveys. The Eugene group yielded a 38% test failures and they were by sex and age, superior to those in other published American studies. Of the Eugene children who failed in the test 78% failed only in one item.

A study was conducted at the Moses Lake Junior High School to evaluate the

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2Glen Kirchner and Don Glines. "Comparative Analysis of Eugene Oregon Elementary School Children using Kraus Weber Test of minimum muscular fitness". Research Quarterly 28: 1 (March 1958): 16
fitness status of the Junior High School boys and girls and to select cub-fit children for further study and to provide individual programmes based upon the pupil's needs, using the Moses Lake Project, sponsored by the Washington State Fitness Committee.

Fox administered the Rogers test, the Kraus–Weber test of minimum fitness, and a battery of motor fitness tests, to freshmen, sophomore and junior girls at Shorelin High School, Washington. Each test was administered two or more times in order to investigate the reliability of tests. The results showed that the Rogers's strength test and Washington Battery were more reliable than those who scored high on the Washington Battery and on the physical fitness scores and there was a moderate correlation between the Washington Battery and the Physical Fitness Index.

Hart compared the physical fitness index of Springfield College male freshmen with the academic success of these students in the first term of their freshmen year. The comparison showed a positive relationship.

Fabricius studied the development of the fourth grade boys and girls who participated in the elementary school physical education curriculum in contrast with those who participated in a regular elementary school physical education curriculum with the addition of selected calisthenics and found that both groups improved in physical fitness in six months, whereas the group having the added calisthenics improved significantly more than the control group.

Snorroason observed from a study conducted, that the school children had ability for speed and quick games whereas the adults for strength and endurance.

Drowatzky conducted a study to evaluate the physical and motor fitness of boys and girls in grades four through 12 and to evaluate effectiveness of the current physical education programmes with development of fitness. The results indicated that there was a progressive decline in the girl’s fitness scores through the junior and senior high school girls and that the fitness levels of boys tested were favorable but not pronounced. Boys who participated in additional physical activity outside the regular physical education classes were significantly more fit than those who did not participated in such activity.

AAPHER youth fitness test was administered to rural and urban boys by Boone. The result showed that the urban boys were superior to rural boys with significant differences. The result also showed that both the groups were weaker on the same components of physical fitness.

Berger conducted the AAPHER physical fitness tests on junior high school boys to compare the physical fitness scores of white and black boys of the seventh grade of similar socio-economic level. The two racial groups were matched. The study concluded that the black male students in the seventh grade had a higher level of physical fitness.

Snorroason, E. "Exercise for Healthy Persons": Therapeutic Exercise (USA: Licht 1965)
Herman Boone. "A Comparison of the Physical Fitness Level of Urban and Rural Boys". Completed Research on Health Physical Education and Recreation (9-1965): 86
Robinson\textsuperscript{11} conducted a study to find out the relationship between physical fitness, scholastic achievement and sports participation with selected secondary school girls and could obtain significant correlation between achievement and participation in intramurals.

Andrew\textsuperscript{12} conducted a study to establish physical fitness norms for South African boys and to compare their physical fitness level with those of Canadian boys. AAPHER physical fitness battery consisting of one-minute sit-up, standing broad jump, the shuttle run, flexed arm hang, 50-yard dash and 300 yard run were administered. The results were found to be significantly in favor of South African boys.

Veereaswamy\textsuperscript{13} administered the AAPHER youth fitness test items to students studying in different schools of Gwalior to assess the physical fitness level. The results indicated that their fitness level was related to the degree of regularity in physical activity.

In 1957 the AAPHER youth fitness test was administered among school children in grades four to twelve and percentile norms were established. In 1965 and in 1976 American samples were again tested and normative comparisons for the different years were made. The results showed that the United Stated children made substantial improvement in motor fitness between 1957 and 1965 but remained essentially the same between 1965 and 1976\textsuperscript{14}

\textsuperscript{11}Ann Robinson M. "A relationship between physical fitness, scholastic achievement and sports participation". Completed Research in Health Physical Education and Recreation. (1970): 89
\textsuperscript{13}B.M Veereaswamy. "A normative study of the youth physical fitness test for the boys in grades nine through eleven in greater Gwalior". Unpublished Masters. Thesis Jiwaji University (1973)
\textsuperscript{14}AAPHER Youth Fitness Test Manual (New ed) American Alliance for Health Physical Education Recreation and Dance Washington (1976)
Using a simple physical fitness test battery, Robson and his colleagues conducted a study on elementary school children and prepared norms for classification of children into ability groups on their physical fitness level.

The school children who took standard fitness test had to take the new health related physical fitness test that was developed by the AAHPERD. This new test was more a teaching tool than performance evaluation. Its designers wanted children to grasp the basic health fitness concepts while they were still growing.

Blair found the result of the study was important because they provided much new information about health related physical fitness in young children. The data suggested strongly that physical education program out of school activity habits and parental activity habits had a significant impact on cardio respiratory endurance and body-composition. As the participants in the study were drawn at random the findings could be extrapolated to the population of American third and forth graders.

Using Kraus-Weber test Moorthy ascertained the effect of selected yogic exercise on minimum muscular fitness in children. After six weeks of the yogic training it was found that the experimental group made a significant gain in the percentage of pass.

For children who would like to participate in a less competitive sport

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15 Robson, "Simple Physical Fitness Battery for Elementary School Children" (1978)
Miller organized a summer sports fitness program with the middle objective of offering a meaningful movement experience for the improvement of skill and physical fitness. Evaluating the levels on the first day the subjects were placed in the appropriate classes. The sport fitness program gave an exciting and enriching experiences to many youngsters as the evaluation sheet of the children were given to the parents indicating their child’s strength and weaknesses.

The AHPHER conducted a survey of the students from seven to fifteen years of age and established norms for eleven variables of Health related fitness and physical performance tests to assess the change between the present and future surveys. The publication of the survey results and the dissemination of information through the schools increased the awareness of fitness and health related aspects of life styles. The results and the norm tables were used by the physical education teachers to compare their student’s scores to the national average of children of the same age levels. To improve the school levels of fitness, AHPHER using the survey results established a fitness award as an incentive for the students, classes and schools to improve their level of fitness.

Administering the test consisting of eight test items namely standing broad jump, sit and reach, agility-run, bent-knee-sit up, 50 meter dash, pull-ups, cricket ball throw and 600 mt. run walk, Singh prepared a physical fitness norm for high school boys of Punjab state.

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Singh undertook a study on college students of Punjab University using Fleishman's Test Battery and found that the physical fitness improved linearly according to age and the students belonging to rural areas were significantly superior in their performance on different items.

A study was conducted to assess the physical fitness status of pupils of two schools in Kano city middle schools, where physical education was not formally taught as a subject in the curriculum and where physical education was taught as a subject in the curriculum. Comparison of the achievements of the pupils in one school with those of the other, on each of the components of physical fitness threw light on the fact that the pupils of schools where physical education was taught as a curricular subject, scored significantly higher except in broad jump. But when physical fitness status of the average middle school child was compared with that of the American School child of the same age or grade, it was found that the averaged of both the schools fell below the 50th percentile. This study pointed out the need for intensifying the formal teaching of physical education in all schools and the need to improve the physical fitness status of pupils in the school system.

Sandra of Columbia University teachers College launched a physical fitness development project to facilitate the development of effective physical fitness program in schools, where physical education programs were not emphasizing physical fitness. The directors admitted that there was a need for

23 Physical Education is a Muslim Culture. International Journal of Physical Education XXIII 1 (1st Quarter 1986): 22
24 Sandra Rose Schmaltz Hill. "A study of the Physical Fitness programme Dissertation Abstracts International 47. 6 (December 1986): 2079-A
a program to educate and motivate students with an additional emphasis on physical fitness. Three major goals were also designed to meet the needs namely enhancement of the awareness and competency of teachers in the area of physical fitness, facilitation of the development of effective program components in the existing physical education curriculum, increase the students knowledge of fitness concepts, fitness level and motivation toward physical fitness.

AAPHERD Health Related Fitness test was administered to children aged seven to 12 years of age that were participating in a movement education program and compared the fitness level with that of the lion’s fitness norms. Scores at the 50th percentile for age and gender indicated a level of fitness that most students could achieve, scores between 25th percentiles and 50th percentile showed a need for improvement and scored below 25th percentiles evidenced a need for remediation.

Singh and others felt the need for constructing the norms of physical fitness, formulation control and assessment of training of sportsmen. They conducted side-split for measuring hip flexibility, forward-bent and reach for trunk flexibility, standing broad jump for leg-strength, shuttle race for agility, 30 meters sprint for speed, bent-knee-sit-ups for abdominal strength, push-up for arm and shoulder strength and one kilometer run for endurance. On the basis of the tests they have constructed the physical fitness norms for state level goal keepers.

26Haridayal Singh "Norms of Physical Fitness for Hockey Goal Keepers". NIS Scientific Journal 3: 10 (July 1987): 3
Singh conducted a study to determine the relationship between physical fitness, area effect, and academic achievement of school boys of Punjab. He came to the conclusion that physical fitness increased as grade increased but there was no significant relationship between academic achievement and physical fitness. The area effect did not give the same results in all the physical fitness variables. The rural boys were better in flexibility and cardiovascular endurance while the urban boys were better in explosive power.

Sharp and others were of opinion that many American children were not in good physical condition and that physical education program had to emphasise the need of health related components of fitness in addition to the motor skill related components.

Koko states that prevention is cheaper than cure; it is already the general trend but many countries of south East Asia region were becoming increasingly aware of the benefits of total health care, embracing preventive, primitive curative and rehabilitative care, rather than mere stress on curative measures to tackle the priority health problem.

The program of NSTC included 12 tests and measurements out of which seven tests were aimed at the evaluation of general physical fitness, three on the evaluation of specific physical fitness and two measurements reflected on physical development. These measurements were evaluated on a

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1 Reet Mohinder Singh. A study to determine relationship between physical fitness area and academic achievement of school boys. NIS Scientific Journal 2 (111) (April 1988): 24
three point system. The results were compared with the norms for 8 to 12 years for girls and boys for talent identification. Those who could score a fixed minimum number of points only would be selected to participate in national level contest.

Kazskibinski says that physical fitness enhanced the enjoyment of life. Seeking the advice from the qualified fitness instructor, a personalized program was prescribed for those whose scores were found to be below average, in the assessment of fitness.

Benham conducted a study to test the effectiveness of the AAU Developmental physical fitness curricular module in promoting physical fitness, fitness knowledge and attitudes, toward physical activity in fifth and seventh grade children. The study revealed that the curricular module was a unique and viable instructional package that provided teachers with a flexible and easy to implement plan for fitness instructor, while curricular usage did not reveal significant difference, the module was as effective in helping children maintain fitness, knowledge and attitudes as a regular physical education program that contains a fitness component in its curriculum.

Corbin had made a survey and had given a brief history of the status of physical fitness testing. The Kraus-Weber Test was indeed a marker in focusing the attention of society on the lack of fitness in American Children.

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and it served a useful purpose in focussing attention on fitness at the national level. There were limitations with norm reference standards. But the norm referenced data was useful in the testing world and that included the physical fitness testing, in evaluating a program, in identifying excellence in achievement and identifying the current status of individuals either locally or nationally. The schools recognized exceptional achievement in many areas of study often at the end of the year. Using the normative data along with criterion-reference standards, could give the teacher a more complete picture of the student's level of physical fitness. In 1985 the National School Population Fitness Survey was conducted to find out whether American Children were physically fit and their fitness level changed over time. It was evidenced that there was a low level performance in important components of physical fitness by millions of children.

A study was conducted by Gutin to find out whether the increase in physical fitness has a positive effect on the abilities of the individual to perform complex mental tasks following physical and mental stress. The study showed that there existed a significant relationship between the degree of fitness improvement and the degree of mental task improvement from pre-test within each group though there was no significant difference between the control group and the experimental group.

Chatterjee\textsuperscript{34} conducted a study of the physical and motor fitness level of Indian school going boys of age nine to eighteen years. The study revealed

\textsuperscript{34}Bernad Gutin, Tina Moses and William Strong, "Defining Health and Fitness: First Step toward establishing Children fitness standards" Research Quarterly for Exercise and Sports 63: 2 (June 1992) 128–132

\textsuperscript{35}Satipati Chatterjee, Anindita Mandal and Nabokumar Das, Physical and Motor Fitness level of Indian School going Boys", Journal of Sports Medicine and Physical Fitness 33: 3 September (1993): 268
that there were major increments in most of the parameters during the maximum spurt in height and weight. The findings also indicated highly significant correlation for all the fitness measures with age, height and weight except PFI 50yd dash and shuttle run where correlation values were negative. The study conducted in India was compared with that of American and Belgian population, and found that that measurement was not applicable to Indian boys.

A study was conducted by Curby to examine the pattern of change in fitness scores in the course of four years of high school physical education program. The results showed that the mean change was largest for the lowest quarter of students from their initial scores and got progressively smaller in each subsequent quarter indicating a pattern of increasing difficulty to improve as one moves higher into the critical performance distribution\(^{35}\).

A study was conducted by Chun\(^{37}\) to develop health related physical fitness norms for Taiwan School Children and youth aged seven to eighteen years and to make age and gender comparison on each of the five physical fitness items. The percentiles for each test item varied by age. The results indicated that the male students did not differ among ages for skin fold thickness though younger female students differed from other female students. Older and younger students differ in sit and reach test. The male students above age ten scored higher in the pull-up test than all female groups. Male students above age 11 did not differed and male students

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average age 13 years scored better in the modified pull-up test than all groups of female students in the one mile run/walk test.

To promote awareness of health fitness and the new test, school children were tested in Japan, Shanghai and Hongkong in-between 1990-92.

The ICHPER. SD Asia Health related Fitness test was administered to middle and secondary students in Hong Kong during 1990-91. Norms were developed for various age groups. Five studies investigating the relationship of fitness with selected personal attributes and characteristics of Hong Kong secondary school students were conducted during 1991-92 using the new test manual 38.

A group of physical educators conducted a study of fitness using questionnaire surveys and fitness test. In the report of the study it was found that developmental tendency in accordance with increasing age was observed in tests such as endurance run, 60 seconds sit-ups, sit and reach. Gradual increasing effects of growth were clearly observed among girls in terms of skin fold thickness and for boys skin-fold measurements stayed roughly the same throughout all tested ages not increasing with age. Results among age groups consistently indicated the sports and physical activities were generally felt to provide strength, health, fitness, relaxation, shape-up effects, and fun and thrill competition, regardless of gender or school levels. Junior high school boys and girls had the greatest amounts of time per week to participate in sports as well as recreational activities. Elementary and senior high school boys and girls had less time39.

The physical fitness of Japanese boys and girls aged 10 to 17 years attending

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38 Frank F Fu ICHPERD.SD "Asia Health Related Physical Fitness Test" ICHPERD.SD ASIA (Spring 1994): 23
39 Zou da Hou "Sport and Physical Activity Behaviour" ICHPERD.SD XJNN.3 (Spring 1994): 17-20
elementary junior and senior high schools in urban areas were assessed using Asia Health Related Fitness test. The norms were constructed for different age groups using the test result. In terms of skewness and kurtosis the results showed that the endurance run had the normal distribution except in the case of 10-year-old boys, where significant skewness was observed. Sit-up result showed normal distribution except in the case of ten-year-old girls where significant skewness was observed. Noticeable skewness was observed in pull-up scores of all groups except in the case of 11 year old boys where skewness was less. Skewed distributions on all groups and extreme skewness in 11-year-old girls were observed in the sum of skin fold thickness. Using the test result five graded evaluation tables were developed using means and standard deviations for normally distributed test and percentile values for normally distributed tests.

Shephard observed an attempt to assess the changes of physical performance as indicators of the response to enhanced physical education. The enhanced program offered one hour of required physical education daily from age 7 to 12 years taught by a specialist physical educator while the control group from immediately preceding and succeeding classes continued with the standard programme of a single period of physical education per week taught by a non-specialist. The study conducted that an enhanced program of physical education could improve function in middle school students but the size of gains was not a strong argument for such programmes. Further the gains in performance test scores indicated the direction but not necessarily the magnitude of program response.

Hatano, Yoshio. "Fitness of Japanese Boys and Girls Ages 10-17 years attending elementary junior and senior high schools in urban areas". ICIPER SD. 3 (Spring 1994): 17-20

The AAHPERD Youth Fitness Test was included as fitness test because norms were included for all test items. The test items used were pull-up test for male, and flexed arm hang for female for measuring arm and shoulder girdle strength and endurance, one minute bent-knee sit-ups for abdominal strength and endurance, shuttle-run for agility, standing long jump for leg-power, 50 yard dash for speed and 600 yard run for cardio respiratory function. For the development of both health related and performance related physical fitness the program consisted of different activities and exercises appropriate for different ages.

Anderson conducted a study to find out the changes over 2 years on different physical fitness measures and the relationship between these changes and changes in physical activity measuring maximal aerobic work capacity functional strength, muscle endurance agility and flexibility. Most physical measures increased over time in boys and in girls and an increase were found in arm extensor strength and trunk extensor endurance, but weight per kg of body mass decreased. Changes in physical activity or sports activity did not related to change in physical fitness level. The study concluded tat the physical fitness level in adolescence was so high that only physical activity at high relative intensity was supposed to have an effect on the fitness level.

Physical fitness represented one of the several facets of sports and physical activity, which could have, in short and long terms, definite influences on the health and well-being of children and adolescents, as well as adults and at the same time the measurements of physical fitness raised several conceptual methodological and technical problems which explained why surveys including such measures had been

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4) L R. Anderson "Changes in Physical Activity are not reflected in Physical Fitness of Teenagers - A Two Year Follow-up Study" Medline R-15 (April 1995)
scarce until recently. Hence a literature review had been made by Michand and Narring in search of the methodological problems linked with fitness measurements. Describing the components of physical fitness as endurance, muscular strength agility, co-ordination and body composition the researcher reviewing the main test batteries available, recommended the utilization of the test batteries in the future, either in the area of research or of individual and collective assessment of physical fitness.44

REVIEW SUMMARY

The studies reviewed in this chapter showed that many nations were concerned with the physical fitness status of their school children and youth and conducted surveys and made reference tables. The review also exhibited that the researchers had shown interest in developing test batteries to test the physical fitness level of the children. A glance through the history of physical fitness testing indicated that the fitness levels of children were unquestionably declining. It was also seen that there was a widespread awareness about the values of physical fitness. But very little was reported in this regard in Indian context as compared to advanced countries. This formed the basis for the research scholar to undertake the present study.

44Michand, P. A. Narring F. "Physical Fitness in Children and Adolescence how can it be measured a review of the Literature." MEDLINE 3, 5 May 1995, 297-504