CHAPTER II

REVIEW OF RELATED LITERATURE

"Observe always that every thing is the result of change, and get used to thinking that there is nothing nature loves so well as to change existing forms and to make new ones like them."

'Marcus Aurelius'55

Undoubtedly, change is the law of life. The resources, society, students; and their needs are also changing. Marcus Aurelius, in his Meditations, has expressed vividly the consideration for a change which is in tune with the development of the physical education curriculum content with the changing times but in an unnoticeable manner.

A number of studies have been conducted on physical education programmes, facilities, intramurals, physical ability and academic ability, athletic participation and academic success, physical performances and academic achievements, health status and academic grades, academic performances, evaluation in health teaching, health and intelligence quotient, but no pertinent study seems to have been conducted so far on the knowledge of health and participation in physical activities in relation to academic grade. Knowledge of health and participation in physical activities are finding a place in the curriculum content of school education in the current times. Evaluation system of academic performance is undoubtedly under severe criticism. However, it is still considered to be a reliable system.

55 Marcus Aurelius, "Change Agent Research", Journal of Physical Education and Recreation 48 (Feb., 77) : 42.
It gives us insight to make a study of new curricular contents in relation to the academic achievements of the students. Lakshmibai National College of Physical Education, Gwalior, is the chief source of collection of excerpts on review of related literature, which is one of the best libraries in India, with a rich collection in the field of Physical Education, Health Education and Sports. The researcher availed an opportunity to go through various types of literature like Research Quarterlies, Journals of various types, Periodicals, Encyclopaedias and relevant books to pick up useful material which has been examined carefully and critically before being incorporated in the present study.

The researcher made sincere efforts to scan libraries of the Delhi University; the Punjab University; Chandigarh; the Central Institute of Education; the National Council of Educational Research and Training and Department of Physical Education of Delhi Administration, Delhi.

While going through various types of literature, it is evident that no such research work on the study undertaken by the researcher has been done so far. Whatever research work has been carried out in the allied areas and which could be traced in the thesis doctoral, post doctoral works, journals, periodicals, reviews and books etc., and is considered related to the present investigation has been cited in this Chapter.

**Relationship Between Physical Activities and Academic Grade**

There has been a lively discussion, through the ages, whether an individual, who participates in physical activities, is a better performer in terms of academic achievements or not? The world has ever been divided on this issue. One group of the so-called radicals held that participation of an individual in physical
activities helps him/her in his/her academic achievements, whereas, the moderates are of the opinion that participation in physical activities is not directly related to the academic performance of an individual. However, the conservative group still holds the view that participation in physical activities is determinental to academic achievement of an individual.

**Positive Relationship**

Review of the literature pertaining to research work, related to participation in physical activities and performance of the child, in terms of academic achievement, reveals that prominent ancient and modern scholars have advocated active participation in physical activities so that the body and mind remain prepared for better academic achievements at a faster pace. Williams et al. cited Aristotle’s view that "the body is the temple of the soul, and to reach harmony of the body, mind and spirit, the body must be physically fit," which has crystallised into the axiom by John Locke cited by Freeman, "A sound mind in a sound body is a short but full description of a happy state in this world; he that has these two, has little more to wish for."

Roger, in his studies, found out that athletes had an average grade 4.45 per cent higher than all boys. Athletes receive scholastic grades comparable

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58 Fredric Rand Roger, "The Scholarship of Athletes" (Thesis, Stanford University), 1922.
to others of equal intelligence. Participation in interschool athletics tends to raise scholarship.

Cooper\textsuperscript{59} found that the correlation between intelligence test scores and achievement test scores is higher for athletes than for non-athletes.

Jacobson\textsuperscript{60} concluded that athletes are higher than non-athletes in terms of academic achievement as measured by the school marks.

Hackensmith and Miller\textsuperscript{61} did a comparative study of the academic grades and intelligence scores of participants and non-participants in intramural athletics. The data, for the said study, was obtained from the academic records at the office of Registrar, the intelligence records from the Department of Psychology; and participation records of 1935-36 school years from the Department of Physical Education.

The study covered 322 students, who were classified as participants and non-participants in intramural athletics; and numbered 161 in each group. The findings were:

1. Participants in intramural athletics, as a whole, have a higher mean intelligence sigma ranking than those who do not participate.


\textsuperscript{61} C.W. Hackensmith and L. Miller, "A comparison of the Academic Grades and Intelligence Scores of Participants in Intramural Athletic at the University of Kentucky", Research Qrtly. 9 (March 1938) : 94-99.
2. That Sophomore participants show a slightly higher mean academic grade and that senior and junior intramural participants demonstrate a definitely higher mean academic grade than do non-participants of the same class.

Reeder\textsuperscript{62} compared data, in the college of records, of 105 varsity athletes in the college of Commerce Ohio State University with the data for student body as a whole. At entrance, athletes did not differ from the general college population in intelligence test scores and scholarship records. At the end of quarters of athletic competition, however, sixty one per cent of the athletes had a lower scholarship standing than at the beginning with respect to probation and dismissal, the athletes did better than the general college population.

Wrightstone\textsuperscript{63} compared some five hundred elementary school children from traditional schools; and from schools where the activity programme predominated. He found that children who participated in activity schools were equal or superior to children from conventional schools in reading, spelling and language. He also found that children from activity schools scored higher in academic subjects.

Stroud \textsuperscript{64} refers to Humphry's investigation on extra curricular participation of high school Juniors and Seniors in a Midwestern city of about 70,000. She found participation to some extent on the part of more than 90% of the group. Accordingly, she sought to determine the relationship between extent

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\textsuperscript{62} J.W. Wrightstone, "Comparison of the Academic Achievement of the children from Traditional Schools and from Activity Schools" Educational Psychology in the class-room ed. by Henery Clay Lindgern (New York: John Whiley and Sons Inc., 1952), p. 515.

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of participation and prestige value of the activities; and academic achievements, intelligence scores and occupational class were all positively related to participation scores; and to the same degree more or less. She said that the three predictive measures are all interrelated.

Russell made a survey of the academic standing of the twelve members of each of the basketball teams in the Iowa boys' sub-state and state tournaments, 1960-61. He compared the grade point average at the end of 1st semester of 1960-61 academic year for every player, for each course in which he was enrolled with the average grade point average of the entire class for the respective course. He found that basketball players, who are highly proficient in their chosen sports, were also above the average of their fellow students in academic achievements.

The Washington State Physical Fitness test was administered by Hays to all male students, at Lincoln High School. The boys were divided into four groups, on the basis of McCloy classification index, samples were drawn by lot from each group. Fitness scores were correlated with average academic grades, in each group, during the fall semester of 1961. Three of the correlations were positive and the fourth was negative, but same was significant at the .05 level. The negative correlation apparently resulted from the high number of seniors who were repeaters in physical education.

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Bucher brought together the findings of a large number of research studies conducted independently over a number of years. He was able to confirm the relationship between motor-skill and academic achievement, as well as the relationship between physical fitness and grade point average.

Richardson's purpose was to better understand students with problems in learning moments. Highly skilled students surpassed the low skilled in status, sociability, social pressure, tolerance aptitude scores and scholastic average. They participated more in sports and associated with people who were more sports minded.

McIntosh conducted research on British boys and girls. He concluded that athletes are higher than non-athletes in terms of academic achievement as measured by school marks.

Carlson, in his work, came to the conclusion that "physical fitness attainment was the difference in composite centile score forms. The IOWA physical fitness test taken before and after enrolment in physical conditioning


class. Academic achievement was the grade point average during the semester. The correlation between physical fitness attainment and academic achievement for a group equated physically (.13); and a group equated physically and mentally (.22), were significant at .05 level.

In order to account for relationship, Schafter and Armer\textsuperscript{71} suggested eight possible explanations: (1) Athletes are graded more leniently. (2) Values acquired in sports are applied in the academic domain. (3) Superior physical conditions improve mental performance. (4) Athletes work harder to obtain grades in order to remain eligible. (5) Athletes make more efficient and effective use of their limited study time. (6) Athletes are motivated to achieve in order to be eligible for an athletic scholarship at college. (7) They obtain additional tutoring and advice from peers, coaches and teachers because they are athletes. (8) The prestige earned in athletics gives them a better self concept and promotes higher aspiration in other domains.

William\textsuperscript{72} found that the peer group had more influence on the decision of youth than did the home, church or school. The school's extra-curricular activities programme attracted very few of the students with low academic achievement.


Rehberg\textsuperscript{73} hypothesizes that there are five intervening constructs between athletic participation and academic achievement.

1. association with highly achievement-oriented peers;
2. transfer of achievement values from sports to the classroom environment;
3. an increasing self-esteem, which creates higher levels of aspiration in other domains;
4. pressure applied internally and externally to present a consistent image in all domains as a successful individual; and
5. more scholastic and career guidance from adults is significant, especially within the school environment.

Mowen\textsuperscript{74} observed the physical fitness relationship between performance scores and knowledge scores of thirty-two senior high school students. He found out the reliability of test (.87), which indicated that the test was internally consistent. Further he found that the 'r' between knowledge scores and gain and loss in physical fitness scores between the two fitness tests was .30.

Berg\textsuperscript{75} made a comparison statistically in regard to academic achievement and participation in intramural athletics. Significant differences were found

\textsuperscript{73} R. Rehberg, "Behavioural and Attitudinal Consequences of High School Inter-Scholastic Sport: A speculative consideration", Adolescence 4 (April 1969): 59-68.


\textsuperscript{75} James Otto Berg, "Difference between Male Participants and Non-participants in College Intramural Sports Programme in Regard to Academic Achievement and Academic Ability", Completed Research in Health, Physical Education and Recreation 12 (1970): 117.
at the .05 level in favour of participants than non-participants.

Spady\textsuperscript{76} found out that athletes' have a higher level of academic performance than non-athletes appears to be almost universal, but a definitive explanation for the relationship is lacking. It has been suggested that there is a link between mental and physical ability.

Robinson\textsuperscript{77} conducted a test with a view to find out the relationship between physical fitness, scholastic achievement and sports participation with selected 248 secondary school girls. She found out significant level of correlation of all variables (P.<.01).

Sighultz\textsuperscript{78} mentioned, in his study, that the participation in athletics did not adversely affect academic achievement. Athletes achieved greater academic success than non-athletes. The better athletes were higher academic achievers than the average athletes.

Buhrmann\textsuperscript{79} studied a group of adolescent boys over a period of 1959-1965. His research showed that "athletic participation was more strongly linked


with educational success among boys."

Lueptow and Kayser\textsuperscript{80} in their studies, dealing with academic achievement and sports participation, do not support the thesis that involvement in sports and extra-curricular activities has any negative consequences for scholarly pursuit.

Snyder and Speritzer\textsuperscript{81} conducted a study on Ohio School girls to find out the relationship between athletic participation and academic orientation. Their findings show that female athletes tended to have higher grade averages and educational goals than their non-athletic counterparts.

More recently, the descriptive work of Eidsmore\textsuperscript{82} has stimulated renewed empirical interest in the topic. He found that high school male and female basket-ball players and male football players are 'brighter' students than their classmates, based on a comparison of grade point average. Although not explicitly stated, the results implied that participation in sports 'caused' better academic performance.

Snyder and Speritzer\textsuperscript{83} conducted a study of intercollegiate athletics


for the American Council of Education. The study provides an excellent summary of the academic performance of college athletes. It has been stated that the individuals, playing the inter-scholastic teams, get higher grades than would be expected from their standardized test scores; and that they do better regardless of the sub-group of the chosen students, poor, wealthy, bright, slow, black and white.

More recently, Keller\(^4\) has shown that students from Kindergarten through college, who achieve high grade point averages perform better on selected physical skill tests than students with low grade point average.

**Insignificant Relationship Between Physical Activities and Academic Grade**

Another side of the picture is also supported by many scholars through their research work who have endeavoured to show through their research that participation in physical activities and sports is insignificantly related to the academic achievement of an individual.

Swanson\(^5\) found the athletes to be of average mental ability. Athletes are slightly better scholars than non-athletes. Similarly Patterson\(^6\) found out that athletes and non-athletes are practically equal scholastically.


A study of Westminster College was done by Davis and Cooper. He concluded that participation in athletics does not interfere with scholarship as indicated by the following grades:

Basketball Lettermen 78.45 per cent; 
Football Lettermen 81.81 per cent; 
Track Lettermen 84.34 per cent; and 
all Lettermen 82.26 per cent.

Cool concluded that the general scholarship average for the latter boys was 79.2 and for the non-letter boys was 80.1.

Bureau of Hygiene, Department of Physical Education, Japanese Government, did the study on athletes in normal schools during the period 1911-15. About 14,004 graduate men of normal school throughout the country were classified into two groups, namely athletes and non-athletes. Morality and scholarship of the two groups were compared. They found that the scholarship of the athletes was slightly more compared with that of non-athletes.

Hindmans studied the intelligence and achievement of four hundred athletic scholarship holders in relation to the rest of their class at the Ohio State University. There was practically no difference in the intelligence and school grades of the two groups.

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According to Jacobsen⁹¹, athletes and non-athletes did not differ materially in average percentile rank on the ability test; proportion of each group placed on probation; proportion of degree granted; grade point average; and correlation between percentile ranks on the college ability test and grade point averages. Athletes earned slightly more credits per quarter in all colleges except engineering.

Seegers and Postipichal⁹² conducted a study on 656 boys of two special schools in Philadelphia. Five athletic test scores were correlated with the result of mental tests. A positive but low correlation was found to exist between I.Q. and scores on athletic tests.

Hinrichs⁹³ attempted to find correlation between health, intelligent quotient, extra-curricular activities and scholastic records. The investigator reported that no generalisation should be made regarding the effect of these factors on scholastic success.

Somers⁹⁴ made a comparative study of participation in extra-curricular sports and academic grades. The graduating class was selected for the study.

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The academic grades of participants in intramural class team competition were compared with those of non-participants. He found out that, "participation in class competition does not appreciably affect, either adversely or favourably, the academic grade of student participants," either in single year or over the entire four years period of collegiate education. She concluded that it is possible for a student to enjoy the benefits of intramural participation and at the same time maintain academic grade equal to those of non-participants.

Bentson and Summerskill\(^5\) of the Cornell University made a study on the personal adjustments of inter collegiate athletes. The investigators studied a group of 118 college athletes with reference to the effect, that success in athletics had, on some aspects of their personality. One of their conclusions was, with aptitudes held constant, there was no significant difference in scholastic achievement between the two groups.

Pongle\(^6\) found that there was no significant difference in scholastic attainment between those who participated in the athletic programme and those who did not.

The results of AAHPER Physical Fitness test for fortyfive tenth grade boys were compared with the boys records of out of school physical activity, their grades in academic subjects and their I.Q., as measured by the California


Test of Mental Maturity. Little relationship was found by Fahrner\textsuperscript{97} between physical fitness and any other of three measures.

Mack\textsuperscript{98} took, in his study, the two hundred randomly selected freshman male students. In the sample, college entrance examination scores did not correlate highly with academic success.

Hart and Shay\textsuperscript{99} said, "Although physical fitness is not a general predictor of academic success, it is high enough to be considered as a necessary factor for the improvement of academic index, in the general education of college student.

Mariah\textsuperscript{100} selected the male students studying in colleges affiliated to Jiwaji University. The marks scored at the annual university examination for athletes and non-athletes for each category were listed separately. The mean for the athletes and for the non-athletes in each category were computed. He concluded that participation in athletics neither hindered nor promoted

\textsuperscript{97} Carl J. Fahrner, "A Comparison of Physical Fitness with the out of School Physical Activity, Academic Achievement and Intelligent Quotient of the High School Students," \textit{Completed Research In Health, Physical Education and Recreation} 2 (1960): 50.


academic achievement at the collegiate level.

Fleishman's Basic Fitness Test were administered by Jones\textsuperscript{101} to 101 randomly selected college freshmen volunteers. Using the data for the whole group showed no significant correlation between physical fitness and the other variables.

Leather\textsuperscript{102} took male students (N=1070) from five classes for his study. A factorial analysis was used to investigate the relationship between physical and mental performance. Multiple regression equation and analysis of variance were also utilized to discover whether the results of the factor analysis were in agreement with other statistical procedures. However, partial support for the hypothesis was found.

Klingwell\textsuperscript{103} drew the conclusion that the student athletes, upon entrance to the University, are comparable to the general population with respect to academic potential as measured by ACT, HSR and SAT scores, but there were significant differences between academic qualifications of the various sports groups; sports groups vary significantly with respect to academic success; the academic success of athletes was a function of academic ability and other related factors, and there was no difference between the academic performance


of grant-in-aid athletes and non-athletes of comparable ability.

Freshmen and senior high school (N=358), who ranked in and lower twenty five per cent of their respective classes were used by Jorndt\textsuperscript{104} for his study. The physical fitness test was constructed by the Maine West Education Department. Class rank was determined by grade average. No significant difference at .05 level was found between physical fitness and academic achievement.

Knutson\textsuperscript{105}, in his study, which involved the learned skills of throwing and pitching the ball, the boys' adjusted mean performance was significantly higher than for the girls. The girls' adjusted mean performance was significantly higher than the boys for rope skipping. From the academic achievement data, it was found that the difference in adjusted mean performance under the various types of physical education leadership was not significant.

Lueptow and Kayser\textsuperscript{106} conducted study on comparative analysis of athletes and non-athletes. Athletes, in their sample, did not show an improvement in grades during their high school years.

Kipling\textsuperscript{107} investigated the relationship between academic achievement

\textsuperscript{104} George S. Jorndt, "The Relationship between Physical and Academic Achievement," \textit{Completed Research in Health, Physical Education and Recreation} 10 (1968): 36.


and athletic participation among college women. On the basis of his findings, it was concluded that athletes and non-athletes achieve comparable numerical grades and do not differ in the attainment of their predicted academic potential, but the academic achievement of athletes is not predicted to the same positive degree as it is for non-athletes.

Becher\textsuperscript{108} collected the data from accumulative guidance folders, the school disciplinary action card file, the Lorain City Police Department and the Lorain County Juvenile Bureau. The following conclusions were drawn:

1. There is no difference in the scholastic ability of athletes and non-athletes as measured by IOWA test of basic skills.

2. There is no difference in the grades of athletes and non-athletes during their sports season and in their off season.

Hanks and Eckland\textsuperscript{109} in their study concerning athletic participation and educational attainment by males and females at both the high school and college level, found that athletic participation by itself was correlated only slightly with educational attainment.

Mauk\textsuperscript{110} investigated the effect of athletic participation on academic

\textsuperscript{108} Bruce Paul Becher, "The Influence of Inter Scholastic Athletes on the Academic Achievement and Social Behaviour of Selected Eighth Grade Students at Hawthorne Junior High School," Dissertation Abstract International 35-11 (1975): 7142A.


of high school athletes. The Ss were twenty SHS varsity athletes and a matched group of twenty SHS non-athletes. Academic achievement of matched groups were measured through four comparisons of means, GPAs and mean raw scores achieved on the school and college ability test. He concluded that there is no significant difference in the academic achievement of high school athletes as determined by the measurement devices.

Thompson\textsuperscript{111} took the academic success of 130 athletes as well as 130 randomly selected non-athletes; and compared the sample population consisting of male and female students who graduated during 1976, 1977 and 1978 from Augustana College in Rock Island, Illinois. The Ss were classified as male athletes (N=98), male non-athletes (N=98), female athletes (N=32) and female non-athletes (N=32). Data collected from seven areas of each student's academic records were used to assess academic performance. Analysis of variance and 't' test were utilized to test for statistical analysis revealed that no significant difference in academic performance existed between male athletes and male non-athletes, or between female athletes and female non-athletes; male and female athletes exhibited about equal academic potential but female athletes attained significant higher grades.

Ss were seventh, eighth and ninth grade girl athletes and non-athletes. Grades in English, Mathematics, Science and History during the 1976-79, school years were used as the measure of academic performances. Shaw\textsuperscript{112} indicated


about the results that there was no significant difference between the academic performance of athletes and non-athletes in any of the grades.

Negative Relationship Between Physical Activities and Academic Grade

In the early 1930's several reviews of studies comparing the scholastic achievement of athletes and non-athletes appeared in professional journals.

Foster did the study on Bates and Bowdoin Colleges also. He found that at Bates College, over a period of five years, the non-athletes exceeded the athletes in scholarship by 5.6 per cent. At Bowdoin College, over a period of five years, the average rank of all athletes in all studies was 77.57 and that of non-athletes was 80.37.

Foster in another study found athletes almost as regular in attendance as non-athletes. But the non-athletes exceeded the athletes in scholarship by a small margin.

Rhoton came to the conclusion that scholarship of athletes was slightly lower than the average for the whole school. Football men's ranks were found appreciably below the scholastic average for the school.

Beau felt that athletes have as much intelligence as non-athletes.


The correlation between scholastic record and intelligence is slightly lower for athletes than non-athletes, but the comparison of the two groups on the basis of scholarship gave the non-athletes very little advantage.

Similar were the findings of Estes\textsuperscript{117}. To him the average grades of athletes were lower than those of non-athletes. Baseball and track athletes made the lowest relative average; Football athletes made decidedly the best relative average.

Cooper\textsuperscript{118} did his studies on equal number of athletes and non-athletes (N=318) of seven colleges and universities of Pennsylvania. He pointed out that non-athletic groups show a slight superiority in achievement.

Cooper\textsuperscript{119} did a study on athletes and their scholarship in the College of Pennsylvania State. Scores in the Carnegie Foundation Advanced Achievement Test for 4,500 seniors in college were taken. He reported that the non-athletic group showed a slight superiority in achievement over the athletic group.

David and Cooper\textsuperscript{120} reviewed forty one such studies conducted between

\textsuperscript{117} Dan Guy Estes, "The Effect of Participation in Organised Athletics on School Grades in Arkansans State Teachers College" (D.Ed. Thesis University of Chicago), 1929.


\textsuperscript{119} H.L. Cooper, "The Effect of Participation in Athletics upon Scholarship Measured by Achievement Tests," Pennsylvania State Student Education 7(1934): 36.

\textsuperscript{120} A. David and H.L. Cooper, "The Effect of Participation in Athletics upon Scholarship Measured by Achievement Tests" Pennsylvania State Student Education 7 (1934): 21.
1903 and 1932 - involving athletes in over two hundred high schools and colleges. In some studies, the subject surveyed extended back over many years. For example, the first one listed was reported in 1903, at Anherst College. Scholarship records were examined for eighteen earlier years to 1885. In most of the reviewed studies, the non-athletes performed slightly better scholastically than did the athletes, but the difference was not statistically significant.

Davis and Cooper\textsuperscript{121} also reviewed forty one studies which appeared between 1903 and 1932. On the basis of the reviews, they concluded, in contrast to more recent findings, that the non-athlete performs slightly better in school work than the athlete does.

Casseigione\textsuperscript{122} examined 132 male university athletes and 119 non-athletes on grade point average. Athletes at each of the three year levels (Freshman through Junior) had lower grade point averages than non-athletes.

\textbf{Knowledge of Health and Academic Grade}

Health education is not taught in the schools as a separate discipline. Therefore, its relationship with academic achievements and athletic performance can hardly be established. However, there are few researches on health and its relationship with academic achievement and physical performances. The results of the foregoing references indicate that health data is an integral


component of academic performance and as such; its propagation through mass-media should be thought of.

Miller\textsuperscript{123} had conducted the study to develop a comprehensive health education programme in higher education for the preparation of public school health educators. After all the research had been completed, the data gathered, were analyzed; and the development of the criteria, and the comprehensive program of health education in higher education was developed. The proposed comprehensive health education program presented in this study developed the concept that the thrust of health education should be directed towards the development of a positive mental and emotional health concept within the individual. Within the program, each course relates to the concept of positive mental and emotional health.

Haram's\textsuperscript{124} main purpose of his study was to analyse the connection between a set of health and physical characteristic and a set of academic measure. The sample of students in the study was drawn from a population of approximately 5,300 students in Junior and Senior High Schools in Bayamon Novte Paerto-Rico. Health and physical characteristics of the students assessed by a self-administered health questionnaire grade point averages and standardized test scores were students' permanent record files. Correlation and Multiple regression techniques were used to test the hypothesis. Correlation although statistically significant were modest in magnitude.


\textsuperscript{124} Elizabeth Marie Haram, "A Study of Adolescent Health Status and Its Relationship to Academic Achievement," Dissertation Abstract International 40-3 (Sept. 1979): 1293A.
The result of the study indicated that health data is an integral component in a study of academic performance and deserves further attention.

Brannan in her descriptive and histographic investigation was conducted to trace, validate and record a history of programme at the Ohio State University, 1872-1981, concluded that "During 1960's, the University sponsored personal health course, taught via television, reached 6,000 to 9,000 students annually; and it received national recognition as an educational and research innovation."

**Sex Differences**

The scholars have also been trying to find out if there exists some difference between two sexes i.e. male and female but have failed to establish significant relationship between them.

Hall found that the boy non-athletes rank considerably higher in intelligence than the boy athletes, while girl non-athletes rank slightly lower than the girl athletes. Boy non-athletes rank considerably higher in achievement in school than the athletes, while the girl non-athletes rank slightly higher than the girl athletes.

Southworth and Turner conducted a study with a purpose of surveying

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the health practice to discover the factors which are directly, related to the present physical status of youth; and to use such information for the building of a more effective health programme for high schools. On the basis of size, type of community and economic status, twenty seven schools were selected and the number of pupils who took test in any one high school was limited to six hundred. No significant difference was reflected in the quality of health behaviour and knowledge of high school pupils in different types of communities. Girls, however, had better rating than boys.

Linda health analogies test was administered to two hundred males and 290 females enrolled in a basic health education course to evaluate the health education knowledge of freshmen students. The result served to the plan, Health Education Course content as VSC, Health Education content areas measured were disease, family living personal hygiene, community health, mental health, tobacco, drugs and nutrition. ANOVA and DUNCAN multiple range were used to depict significant difference between males and females, and the seven health education categories. Nutrition scored highest in knowledge for both male and female. Health education knowledge was the weakest in personal hygiene, family living and disease. ANOVA revealed no significant differences in health education knowledge in the all categories between the males and female.

Accordingly, the above review of literature reveals that no comprehensive study seems to have been taken up with the objective of relationship of academic grade with knowledge of health and participation in physical activities.

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