CHAPTER – II

REVIEWS OF LITERATURE

Review provides the valuable insight about research topic and to the investigator. A research reviews it will creatively helpful to investigator in identifying the methods that have been successfully used to solve the particular types of problem to know deeply about the chosen study and related studies already done. The literature in any field forms the foundation upon which all future frameworks will be built. The reviews were conducted by verifying the available research references, periodicals, journals, and books related to similar studies. The collected reviews were presented under the various categories as follows.

Reviews on Motor fitness Nutrition Status Academic Achievement and Sports Participation

Kantomaa, et.al (2013) wanted to find out if Physical activity and obesity mediate the association between childhood motor function and adolescents’ academic achievement. This prospective study investigated whether childhood motor function predicts later academic achievement via physical activity, fitness, and obesity. The study sample included 8,061 children from the Northern Finland Birth Cohort 1986, which contains data about parent-reported motor function at age 8 years and self-reported physical activity, predicted cardio respiratory fitness (cycle ergometer test), obesity (body weight and height), and academic achievement (grades) at age 16 years. Structural equation models with unstandardized (B) and standardized (β) coefficients were used to test whether, and to what extent, physical activity, cardio respiratory fitness, and obesity at age 16 mediated the association between childhood motor
function and adolescents’ academic achievement. Physical activity was associated with a higher grade-point average, and obesity was associated with a lower grade-point average in adolescence. Furthermore, compromised motor function in childhood had a negative indirect effect on adolescents’ academic achievement via physical inactivity and obesity, but not via cardio respiratory fitness. These results suggest that physical activity and obesity may mediate the association between childhood motor function and adolescents’ academic achievement. Compromised motor function in childhood may represent an important factor driving the effects of obesity and physical inactivity on academic underachievement.

Lambourne et al., (2011) in his study he has revealed that physical fitness of a student directly related to achievement in the academic achievement activities. Classroom activities improved Body mass index (BMI) and cognitive function. The association between physical activity, cardiovascular fitness, fatness, and cognitive function during childhood and adolescence. Evidence also suggests that these variables are linked to academic achievement. Classroom-based physical activity provides a viable approach to improve fitness, body mass index (BMI), cognitive function, and ultimately academic achievement. Studies examining the relation between physical activity, fitness, fatness, cognitive function, and academic achievement are described. The role of physical activity in the classroom was also supported by the Physical Activity across the Curriculum project.

Jane U. Edwards (2011) this study support curriculum and policy, a Midwest city school district assessed the association of selected categories of nutrition and physical activity (NUTR/PA) behaviors, fitness measures, and body mass index (BMI) with academic performance (AP) for 800 sixth graders. Students completed an adapted
Youth Risk Behavior Surveillance Survey (NUTR/PA behaviors), fitness assessments (mile run, curl-ups, push-ups, height, and weight) with results matched to standardized scores (Measures of Academic Progress [MAP]), meal price status, and gender. Differences in mean MAP scores (math and reading) were compared by selected categories of each variable utilizing 1-way analysis of variance. Associations were determined by stepwise multiple regression utilizing mean MAP scores (for math and for reading) as the dependent variable and NUTR/PA behaviors, fitness, and BMI categories as independent variables. Significance was set at $\alpha = 0.05$. Higher MAP math scores were associated with NUTR and PA (increased vigorous PA and sports teams; reduced television), and fitness (higher mile run performance). Higher MAP reading scores were associated with NUTR (fewer SB) and PA (increased vigorous PA, reduced television). Many positive NUTR/PA behaviors and fitness measures were associated with higher MAP scores supporting the school district focus on healthy lifestyles. Additional factors, including meal price status and gender, contribute to AP.

An De Meester et.al (2016) conducted a study on the Positive associations between motor competence and physical activity have been identified by means of variable-centered analyses. To expand the understanding of these associations, this study used a person-centered approach to investigate whether different combinations of actual and perceived motor competence exist and to examine differences in physical activity levels and weight status among children with different motor competence-based profiles. Children’s actual motor competence was measured with the Test of Gross Motor Development-2 and their perceived motor competence via the Self Perception Profile for Children. We assessed physical activity via accelerometers; height through stadiometers, and weight through scales. Cluster analyses and MANCOVAs were used to analyze the data. The analysis generated two predictable
groups: one group displaying relatively high levels of both actual and perceived motor competence, and one group with relatively low levels of both. One additional group was also identified as having relatively low levels of actual motor competence but relatively high levels of perceived motor competence. The high-high group demonstrated higher daily physical activity and lower BMI than the low-low group. The low-high group had similar physical activity-levels as the low-low group and did not significantly differ in BMI from the other two groups. A combination of high actual and perceived motor competence is related to higher physical activity and lower weight status. In his research he has recommended that expand health interventions in children with components that foster than development of both actual and perceived motor components.

Li-Jung Chen et.al (2013). Examined the association between fitness change and subsequent academic performance in Taiwanese schoolchildren from 7th grade to 9th grade. The 7th graders from 1 junior high school district participated in this study (N = 669). Academic performance was extracted from school records at the end of each grade. Cardiovascular (CV) fitness, sit-and-reach flexibility, bent-leg curl-ups, and height and weight for calculating body mass index (BMI) were assessed at the start of each grade. The results showed that improvement in CV fitness, but not muscular endurance or flexibility, is significantly related to greater academic performance. A weak and non-significant academic-BMI relationship was seen. CV fitness exhibits stronger longitudinal associations with academic performance than other forms of fitness or BMI for adolescents.
Toni M. Burkhalte and Charles H. Hillman (2011) reviewed studies that examine the relationship of energy consumption, storage, and expenditure to cognition and scholastic performance. Specifically, the literature base on nutrient intake, body mass, and physical activity is described relative to cognitive development and academic achievement. The review of literature regarding the overconsumption of energy and excess body mass suggests poorer academic achievement during development and greater decay of brain structure and function accompanied by increased cognitive aging during older adulthood. The review of literature regarding energy expenditure through the adoption of increased physical activity participation suggests increased cognitive health and function. Although this area of study is in its infancy, the preliminary data are promising and matched with the declining physical health of industrialized nations; this area of science could provide insight aimed at improving brain health and cognitive function across the human lifespan.

Dodsworth, Lindsey M (2010) studied about proper nutrition that abides by United States Dietary Guidelines is critical in the cognitive, behavioral, emotional, and physical functioning of students. Food and drink choices that students make are heavily based on their preferences and what is available to them. It reveals that students who consume balanced, nutrient dense food and drink perform better in areas of participation, behavior, attendance and get their assigned tasks done more completely than students who do not eat well. Research says that young people of today will be functioning members of society in the future so equipping them with proper education and skills for success is a critical role that educators must capitalize on, however, improper nutrition often poses a serious barrier to equipping students with the necessary tools and skills for success.
Kudzai Chinyoka (2014) conducted a survey and examined the impact of poor nutrition on the academic performance of grade seven learners at two primary schools in Chivi, Zimbabwe. The main objective is to identify mitigation policies and measures designed to reduce negative effects of poor nutrition on children’s academic performance. Malnutrition remains one of the major obstacles to human well-being affecting all areas of a child's growth and development, including performance in the classroom. The study is grounded in Maslow’s motivational and needs theory. In this study, a qualitative phenomenological case study design was used with focus group discussions, interviews and observations as data collection instruments to twelve (12) grade seven learners, three (3) headmasters and four (4) teachers, purposively sampled in Masvingo province. Findings revealed that malnutrition affected physical growth, cognitive development and it consequently impacts on academic performance, health and survival of learners. Malnutrition also deepens poverty due to increased health care costs. The study also established that hungry and undernourished grade seven learners were not able to take on physical work and sporting activities seriously and they are less able to attend school, concentrate and learn.

Dr. Santanu Ghosh et.al (2013) analysed the development of any nation or community depends largely on the quality of education of such a nation. Understanding the nature of the causal relationship between health and education is important to determine the exact relation between them. The mechanism by which health and nutrition influence educational achievement is not well established, but poor health and malnutrition in early childhood may affect cognitive abilities, necessary for learning process and consequently educational achievement. This study shows that that, firstly, the tribal students have lower BMI values than their nontribal counterparts which may be due to dietary differences – tribal students have less access to convenience foods and
as such may have less consumption of these type of empty calorie containing foods. Also the academic achievements of tribal students are a little lower than their nontribal counterparts which again comes out in the regression and negative correlation of BMI with academic achievement.

**Naik SR et.al (2015)** compared the nutritional status and academic achievement of 135 Lambani school children was conducted at Hoovinahadagali taluk, Bellary district during 2012-13. All the children of 9-11 years of age studying in 4th and 5th standards were selected from 5 government primary schools. The nutritional status was assessed by using anthropometric measurements (height and weight), academic achievement in terms of previous year grades. The results revealed that there were highly significant differences found in mean height and weight of children with respect to their NCHS norm values in both groups by age and gender. There was positive and highly significant difference found between nutritional status with academic achievement, Hence increase in the nutritional status of children in turn the academic achievement.

**Kavindra Kumar Kesari (2008)** investigated the nutritional status of 7-10 years school going children. A total of 150 school going children were selected from four different schools of Allahabad district, India. Dataon dietary intake was collected by using 3 days dietary recall method. Heights, weights and Mid Upper Arm Circumference were measured. Hemoglobin levels of children were estimated by cyan met hemoglobin method. Clinical status assessing anemia was also recorded. Consumption of all the nutrients by majority of the students was comparatively less than the recommended dietary allowances. It is concluded that poor anthropometric indices, under nutrition and iron deficiency anemia may be due to lower intake of food and nutrients than recommended.
**Munesh Kumar Sharma et.al (2011)** designed their study by framing research Question about: What is the extent of under nutrition among under-five children in Allahabad and what its social correlates are. Objectives of their study were: To examine the prevalence of under nutrition as measured by standard developed by Indian Academy of Pediatrics (IAP), To find out the association of under nutrition with social factors: social background and standard of living, To suggest some preventive measures for improving nutritional status. The scope of the study was Rural, Urban and Slum population of Allahabad, Uttar Pradesh. Study Design: Cross-sectional. Participants: Under-five children whose parents gave consent to include them in the study. In his study using the Statistical Analysis: Nutritional assessment by IAP classification weight-for-age. Statistical tests like Normal test of proportions, Chi-square test, Analysis of Variance (ANOVA). He found that Children belonging to slum area and of low standard of living index (SLI) were at significantly higher risk. Finally he concluded that the study demonstrates a very high prevalence of under nutrition. The slum population has been found to be at a higher risk of getting lesser than RDI of nutrients. The study also suggests the need of adopting some multi-sectorial and integral strategies for raising people’s living standards for reducing anthropometric failures among children.

**Mubashir Hussain Malik (2016)** Reported the Physical fitness is the ability to carry out daily tasks with vigour and alertness; without undue fatigue. The purpose of this study was to compare the health related physical fitness of Rural and Urban School going Children of Jammu and Kashmir State. The research was a descriptive comparative method. A total of 70 school going children (35 Rural, 35 Urban) were selected randomly from the 10 Schools of Budgam District of Jammu and Kashmir Respectively. The criterion measures adopted for this study were, Flexibility, muscular...
strength and Endurance, and speed. The data collection tools used in the study were sit & reach, Sit Ups, 50 yard dash. Data of Physical Fitness Components between Rural and Urban children was compared by using independent Sample ‘t’ test. The level of significance was kept at 0.05 level of significant to test the hypothesis. The statistical analysis of physical components revealed that in the parameters such as sit-ups, sit and reach, and 50 m dash there was significant difference between rural and urban school going children. The results also showed that all the physical fitness components the Muscular strength and Endurance, Flexibility and speed rural school going children were found to be better than urban school going children. Finally the researcher concluded that the rural school going children were more fit as compare to urban school going children.

**Joseph E. Donnelly et al. (2016),** in this study he examined the relationship among physical activity fitness, cognitive function, and academic achievement in children is receiving considerable attention. The students of range 5-13 years for three different types of the test like physical activity (PA), physical education (PE) and sports activity (SA). He analyzed on two different data sources, one is cognition, learning, brain structure and brain function. Another one is standardized achievement test performance and concentration attention. Through his experiments he proved that physical activity has a relationship to areas of for brain that support complex cognitive process. He concluded that physical activity has a positive influence on cognition as well as brain structure and function.
Trudeau and Shephard (2008) examined physical education, school physical activity, school sports and academic performance. They reviewed the relationship of academic performance and some of its determinants to participation in school-based physical activities, including physical education (PE), free school physical activity (PA) and school sports. Linkages between academic achievement and involvement in PE, school PA and sport programmes have been examined, based on a systematic review of currently available literature, through databases, from 1966-2007. Quasi experimental data indicate, that allocating up to an additional hour per day of curricular time to PA programmes does not affect the academic performance of primary school students negatively, even though the time allocated to other subjects usually shows a corresponding reduction. An additional curricular emphasis on PE may result in small absolute gains in grade point average (GPA), and such findings strongly suggest a relative increase in performance per unit of academic teaching time. Further, the overwhelmingly majority of such programmes have demonstrated an improvement in some measures of physical fitness (PF). Cross-sectional observations show a positive association between academic performance and PA, but PF does not seem to show such an association. PA has positive influences on concentration, memory and classroom behaviour. Data from quasi-experimental studies find support in mechanistic experiments on cognitive function, pointing to a positive relationship between PA and intellectual performance. Given competent providers, PA can be added to the school curriculum by taking time from other subjects without risk of hindering student academic achievement. On the other hand, adding time to "academic" or "curricular"
subjects by taking time from physical education programs does not enhance grades in these respondents and may be detrimental to health.

Wilson (1968) attempted to study the personality traits, academic achievement and health status of men with low and high physical fitness scores. Ten men with the highest and ten men with the lowest physical fitness scores from the 1966 entering freshman class at the University of Oregon were given individual case studies. For the study he has taken ten each for high and low physical fitness score men and he has proved that low physical fitness students had high number of visit to student health centers, as compared to high physical students has low number of visit to student centers. For this study he has taken questionnaire method.

Xianwen Shang et.al (2010) investigated the association of weight status with physical fitness among Chinese children. Methods. A total of 6929 children aged 6–12 years were selected from 15 primary schools of 5 provincial capital cities in eastern China. BMI WHO Criteria was used to define underweight, overweight and obesity. Physical fitness parameters including standing broad jump, 50 m sprint, and 508 shuttle run were tested. He found that no significant difference in all three physical fitness tests. An inverse association of obesity with cardiorespiratory fitness, muscle explosive strength, and speed was identified among Chinese children.

Shannon U. Shook MA (2016) Researchers have reported on the relationship between academic achievement and physical fitness levels. At one rural middle school, 25% of the students enrolled were either overweight or obese and failing at least one course. Educators at the local site were seeking methods to improve the academic achievement of their students. The purpose of this quantitative study was to examine the relationship between academic achievement and physical fitness of middle school
students at the study site. Framed by the theoretical connection between improved physical fitness levels and academic achievement, the research questions examined the relationship between physical fitness levels of 6th grade students (N = 216) as measured by their Presidential Youth Fitness Test (PYFT) and the state-mandated Criterion Referenced Competency Test (CRCT) scores in the areas of mathematics and reading. Findings from correlational analyses indicated small, significant positive relationships between students’ CRCT in mathematics and reading and their PYFT levels. The link between personal fitness and academic achievement should be further explored; researchers should also consider potential moderating variables related to demographics, motivation levels, and educational and community support. Based on the findings of the study, physical educators at the local site should advocate for physical fitness and promote the connection between physical fitness and academic achievement. The implications for positive social change include providing local research findings to the school leadership that may have a positive effect on academic achievement.

**Robinson (1970)** examined the relationship between physical fitness, scholastic achievement and sports participation among selected secondary school girls. Physical fitness was determined by the California Physical Performance Test; grade point average for all courses taken for the school year represented scholastic achievement. When all grade levels were combined the correlations were significant. (P .01)

**Mack (1963)** investigated the relationship of Physical fitness to grade point average of freshmen at Washington State University. He collected fitness test scores, grade point averages, and raw linguistic, raw quantitative and total A.C.E. scores for 200 randomly selected freshman male students. The Physical fitness test showed a lack
of relation with the A.C.E mental ability examination and the grade point average during the first semester. None of the fitness test items was a general predictor of academic success.

**Jones (1966)** determined the relationship of physical fitness to academic success. Fleishman’s Basic Fitness Tests were administered to 101 randomly selected college freshman men volunteers. Using the data for the whole group showed no significant correlation between physical fitness and the other variables, although a low correlation between grade point average and scholastic aptitude was significant when the men were separated into high, average, and low groups on physical fitness, the only significant correlations were for the high group where academic aptitude was negatively related to both physical fitness and the amount of athletic participation in high school.

**Jarman** studied the interrelationship between academic achievement and selected and maturity physique strength and motor measures of fifteen year old boys. The academic achievement criteria were the Iowa tests of educational development and grade point averages. Subjects (N = 105) were given 21 tests of maturity physique body size muscular strength and endurance and motor ability most of the significant correlations between academic achievement and other variables were negative.

**Pankaj Chaudhary (2014)** studied the mind and the body controversy seems to have been the concern of the philosophers since the day of Ancient Greece. Kane states that, even in the process of thinking in which the use of the body seems to be reduced to minimum it is matter of common knowledge that of mistake can often be traced to bad health. A sound mind in sound body the problem is state as “The Study of Relationship of Physical Fitness Components and Academic Achievements of Rural
and Urban Girls of Gadchiroli District”. To Study the relationship of physical fitness components and academic achievement of rural and urban. The study would help in the selection of brilliant students on the basis of physical fitness. It was hypothesized that there would be significant correlation between Academic achievement and physical fitness scores of rural girls and urban girls. The fitness score were converted to T-scores to make composite score. The study may be under taken to find out the factors which adversely affects the academic achievement of student who are physically more fit and vice versa.

Hands, B. et al (2008) explains among physical activity, physical fitness and motor competence are important health-related constructs. In this study, motor competence pedometer determined physical activity and physical fitness like aerobic fitness, muscle strength, muscle endurance, flexibility and body composition which were examined in a cohort of 1585 adolescents including 771 girls, 814 boys of mean age 14.06 years. Out of this hip and shoulder flexibility, males out performed females. For both males and females, motor competence was associated with all fitness measures, physical activity was associated only with aerobic fitness, motor competence, BMI and chest pass. Among males, aerobic fitness was also associated with all other fitness tests.

Toriola, O.M. & Monyeki, M.A. (2012) found that girls were more overweight and less active than boys. In view of the health implications of the findings, there is a need to create enabling environment and opportunities that will promote physically active lifestyle and develop life-long positive attitudes towards PA among the learners. Community-based strategies designed to facilitate effective and sustainable PA intervention programmes in schools are recommended.
Beyond improvements in academic self-concept, Marks (1977) notes that school sports shape discipline in the classroom within the context of the spend-and-drain theory. He argues that participation in sports channels students’ abundant energy, making them feel more energetic for athletic competition. In addition, expanding excess energy in sports stimulates students’ interest in school, leading to increased commitment to academic values. As a result, student athletes have lower rates of absenteeism from class than non-athletes.

Anna Arulmozhi (2013) study result reveals that there existed significant difference between the above average achievers and average achievers; above average achievers and below average achievers; and average achievers and below average achievers of gender on power. There existed significant difference between genders irrespective of academic achievement on speed. Hence it reveals that there was no significant difference between average achievers and below average achievers and above average achievers and average achievers of gender on power. Further, it also reveals that there no significant difference on speed among the gender at different academic achievement.

Reviews on Motor fitness and sports participation

Monyeki, M. A and Kemer. H. C.G (2007) investigated the Physical activity is regarded as an important component of a healthy lifestyle. It is a well-known notion that physical activity is strongly related with physical fitness in adults (Blair et al., 1989; Anderson & Haraldsdottir, 1995; Young & Steinhardt, 1993). The aim of this review is to investigate as whether this notion will exist for the Ellisras rural children and children from other studies. Eight out of 11 found published studies which investigated the relationships between physical activity and physical fitness in children were included
in the review. The included observational studies met the criteria used in the selection covering physical fitness and physical activity in children between the ages from 5 to 14 years old. An overview of Ellisras Longitudinal Study and other 7 eligible studies shared common findings of either few or low and moderate relationship between physical activity and physical fitness and especially with endurance performance does exist. The observed results therefore warrant further investigation on this relationship over a period of time from different cultural contexts.

**Shashidhara (2016)** examined It is common experience that rural high-school boys are better in motor fitness than urban high-school boys on account of their rigorous lifestyle. However, conflicting results have been reported in researches that were surveyed. Hence the objective of study was to investigate the motor fitness levels of rural and urban high school boys. A sample of 50 urban and 50 rural high school boys in the age group of 14-16 years were tested using “Standardized Oregon Motor fitness test battery” for the purpose. For data was subjected to simple ‘T’ test using SPSS V-21 statistical package. The study revealed that there existed a significant difference between urban and rural school-boys. The direction of difference was in favour of urban high-school boys. Therefore it was concluded that the urban school boys of Raichur district have higher level of motor fitness.

**Pradip Kumar Paul (2014)** in this investigation an attempt has been made to find out the motor performance status of school boys of Naihati Narendra Vidyaniketan in the North 24 parganas district of West, India. For this reason, 90 male students of 14, 15 and 16 years age group were considered as subjects. The subjects were selected randomly for this purpose and were assessed for their motor performance status. The motor performance parameters were restrained to Height, Weight, Agility, Leg
Explosive Strength, Speed, Coordination and Endurance using standardized tests and procedures. The data on the motor performance parameters were analyzed by applying ANOVA to find out significant differences if any among the age groups and Bonferroni corrections post hoc test. The level of significance to assess the statistical values obtained was set at 0.05 and also 0.01 level of confidence. The research findings ensure statistically considerable age difference on selected variables and it implies that age differences influence almost all motor performance parameters.

Sanjaykumar. S. Awati (2014) analysed the word “Physical Education”, Refers to various bodily characters such as physical strength physical development physical health and physical appearance. It refers to the body as a contrasted to mind physical education should aim to improve the mass of students and give them as much health struggle and stamina as possible to unable physical education is the process by which changes on the individual or brought about through his movement experience physical education is the some of the changes in the individual caused by experience centred in motor ability. The purpose of the study is found out the A Comparative Analysis on Physical Fitness of Rural and Urban High School Students. This study will help coaches and physical education teachers in selecting the good players. This will help physical education teachers and coaches in preparing training programme. This will lead to success in future planning. This will reveal which of the two groups possess better physical education. The result of the study will help to students to participate in sports and game. The result of the study will give the clear idea about physical fitness of the rural and urban boys.

Dorita DU TOIT et.al (2011) in their association determine the relationship between physical fitness and academic achievement in an urban South African group of primary school children. A one-way cross-sectional design was used to assess
physical fitness of children 9 to 12 years (N=212) by means of the Fitness gram, the Bruininks-Oseretsky. Test of Motor Proficiency II, percentage body fat and Body Mass Index (BMI). Average end-of-the-year academic marks served as measurement of academic achievement. Relationships between the variables were determined by Spearman correlation coefficients and effect sizes, and a stepwise discriminant analysis. The results show a significant correlation between total strength scores and academic performance in the total group and between several fitness variables and academic performance in the female group. Significant correlations were found between specific strength tests and academic performance among older boys (12 years) and older girls (11 & 12 years). Several fitness parameters discriminated between high and low academic achievers. A positive relationship between physical fitness components and academic achievement was found with more significant correlations among girls than boys, as well as among older boys and girls.

Daniel F. Perkins et.al (2004) in his study examined whether organized sports participation during childhood and adolescence was related to participation in sports and physical fitness activities in young adulthood. The data were from the Michigan Study of Adolescent Life Transitions. The analyses include more than 600 respondents from three waves of data of age 12, age 17, and age 25. Childhood and adolescent sports participation was found to be a significant predictor of young adults participation in sports and physical fitness activities.

Valter R. Fernandes et.al (2016) determined the relationship between exercise and cognition is an important topic of research that only recently began to unravel. Here, we set out to investigate the relation between motor skills, cognitive function, and school performance in 45 students from 8 to 14 years of age. We used a cross-sectional
design to evaluate motor coordination (Touch Test Disc), agility (Shuttle Run Speed—running back and forth), school performance (Academic Achievement Test), the Stroop test, and six sub-tests of the Wechsler Intelligence Scale for Children-IV. We found, that the Touch Test Disc was the best predictor of school performance. Significant correlations were also observed between motor coordination and several indices of cognitive function, such as the total score of the Academic Achievement Test, as well as two WISC-IV sub-tests: block design and cancelation. All the other cognitive variables pointed in the same direction, and even correlated with agility, but did not reach statistical significance. Altogether, the data indicate that visual motor coordination and visual selective attention, but not agility, may influence academic achievement and cognitive function. The results highlight the importance of investigating the correlation between physical skills and different aspects of cognition.

**Hill (1972) investigated** the relationship between motor ability and physical fitness of children five through eight years old. He used one hundred and thirty three male and one hundred and twenty three female subjects and gave them Iowa Brace Test of Motor Ability and Glover Physical Fitness Test for physical fitness. Statistical treatment revealed that physical fitness had no value in the prediction of motor ability.

**Lane (1966) conducted** a study to determine the relationship between physical fitness and motor ability of high school grills. The AAHPER Youth Fitness Test and the Humiston Motor Ability Test were administered to 69 grade 9 girls, aged 14 years, before and after a planned physical fitness programme. The group improved on both tests, and the correlation between physical fitness and motor ability was higher after the planned fitness programme.
Hein and Ryan (1960) reported that clinical observations and experimental studies point to definite values of exercise in preserving the health of the cardiovascular system and also prolonging the life. Report on active and sedentary occupations with both under stress, show that the death rate from coronary heart disease is the highest among the sedentary occupations. Physical activity appears to give cardiac protection.

Buckellew (1965) carried out a Sectional and longitudinal study of various factors of growth and development of fifth, sixth, seventh and eighth grade boys. At each grade level, subjects were evaluated in physical fitness (AAHPER Youth Fitness Test) and educational achievement (Iowa Basic Skill Test). There was no apparent relationship between physical fitness and academic achievement.

Dwyer et al. (1983) showed that participation in physical fitness programs emphasizing endurance in 10-year-old school children improved physical work capacity and decreased body fat without loss of their academic performance.

Basch CE. (2011) in his study urban minority youth revealed that Physical inactivity is highly and disproportionately prevalent among school-aged urban minority youth, has a negative impact on academic achievement through its effects on cognition.

Anuar Zaini M Z et. al. (2005) found that Academic performance was significantly correlated with breast feeding, income and educational level of their parents, BMI, and whether they have been taking breakfast. There was a weak correlation between presence of anemia and intellectual performance. Improving the socio-economic status of the parents will lend a helping hand in the academic performance of the students. Since breast feeding is associated with better academic and intellectual performance it must be emphasized, particularly to expectant mothers in the antenatal clinics.
Reviews on Nutrition status and sports participation

Howard Taras (2005) compared the association between nutrition among school-aged children and their performance in school and on tests of cognitive functioning. Article is accompanied by a brief description of its research methodology and outcomes. Articles are separated into 4 categories which contains food insufficiency, iron deficiency, supplementation deficiency and supplementation of micronutrients, and the importance of breakfast. Research shows that children with iron deficiencies sufficient to cause anemia are at a disadvantage academically. Their cognitive performance seems to improve with iron therapy. He observes the similar association and improvement with therapy is not found with either zinc or iodine deficiency, according to the reviewed articles.

Mary Ellen Bingham et.al (2015) investigated the adolescents participating in sport have high demands for nutritional adequacy to meet their needs for growth, development, wellness and athletics. And he explains about nutritional risk can be quite high in this population due to their unique needs, low access to credible information and nutrition professionals, and misinformation in the media and marketplace specifically targeting athletes. Physicians and other health professionals have an opportunity to communicate nutrition facts and make evidence-based recommendations about healthy eating in the setting of their ongoing interactions with adolescent athletes and their families. The purpose of this review is to describe the nutritional needs of adolescents participating in sport and highlight the potential for nutritional risk. Endorsed by professional organizations, our recommendations emphasize a balanced eating pattern that includes a wide variety of fresh, minimally processed whole foods. The purpose of the review is to empower and teach adolescents to take responsibility
for planning, preparing, and providing themselves consistent access to foods and fluids that deliver nutrients needed for proper fueling and recovery.

**Mahalakshmi Sangeetha et.al (2014)**. Examined the Nutrition plays an important role for attaining high level of achievement in sports and athletics, besides other factors such as motivation, skill, techniques, commitment, physical fitness and training. Studies suggest that athletes lack knowledge of nutrition, healthy food choices, components of a well-balanced diet, and the implications of nutrition on performance.

**Rekha Narwal (2014)** carried out the Nutritional food plays a vital role in the daily life of Sports persons. The data were collected with the help of pre tested questioners regarding personal information, meal and diet pattern, nutritional intake and participation in sports events. The observation scheduled was used for recording anthropometric clinical and biochemical examination. It was found that the majority of sports women was up to 19 years of age and educated up to graduation. In respect of knowledge about nutrition in dietary requirements the sports women were found to moderate.

**Aaron Kyle Schwartz (2014)** Nutrition knowledge, dietary intake, body composition and perceived sport performance were measured before and after an eight week nutrition intervention. The sample of eleven male high school football athletes aged 14-18 years old. Baseline nutrition knowledge was higher than anticipated but fruit and vegetable intake was low. The present study suggests that a nutrition intervention can improve dietary intake and perceived sport performance among adolescent athletes.
Kumari, K (2005) the present study relates to a survey of daily nutritional intake (total calories, protein, iron and vitamin A) in 700 school going children belonged to different income groups in Patna. The growth status of children was evaluated by applying anthropometric parameters. The result showed that children of low-income group (LIG) families were deficient in all categories of daily supply of nutrients. The most pronounced deficiency was vitamin A in which 61.80 per cent of male and 59.78 per cent of female children of LIG families received less than 55 per cent of the recommended daily allowance (RDA). Under each category of nutrient, children belonging to HIG families also showed varying degree of deficiencies. The average height among children was found to be slightly less than the standard recommended by the National Centre for Health Statistics (NCHS). Average weight was observed to be slightly higher in comparison to the NCHS standards which may be probably due to altered food habits among children. Nutritional deficiencies in children of HIG families indicated that there was a lack of awareness of a balanced and nutritious diet independent of the economic factor among families.

Shore (1972) constructed motor fitness test battery for lower elementary grade boys. Thirty Experimental test items considered as valid and reliable means uses of motor fitness were administered to 238 boys. After analyzing the data two test batteries containing seven items each were developed on the basis of the rotated factor loading of the test items. Test battery-I contained the highest loaded test item for each factor such as Clark’s strength composite; Mc Cloy’s endurance ratio; Well’s Sit and Reach test; Bass balance or stick; Log flexior can extensor flexibility; Arm flexion or the back flexibility and Modified push-ups test. The second battery-II contained more administratively feasible test items strength such as Grip strength; 300 yard run; Well’s
sit and reach; Bass balance on stick length wise; Leg flexior and extensor flexibility; Arm flexior or the back flexibility; and modified pushups.

**Kinney (1972)** constructed motor fitness test battery for under graduate male physical education Majors. Forty nine test items were selected as valid measures of the eight motor fitness components and were administered to 121 under graduate males. The data were analyzed according to the principle axes method with varimare criterion for rotation. Five factors were isolated and named, speed endurance, gross strength, power, flexibility and relative muscular strength, muscular endurance. Two test batteries having five items each were developed or the basis of the rotated factor loading Test battery I contained highest loading items (1) Time limit shuttle run (2) Cable tension (3) 10-yard dash. (4) Thigh flexor flexibility (5) Bar push-ups. A physical ability test battery for New Zealand schools was developed by modifying the Fleishman battery of physical ability tests by Mc Caughan to produce national norms for a battery of physical ability tests that can be used to assess the relative fitness of New Zealand secondary school boys. Modifying four original test nine tests recommended by Fleishman were used. Percentile and T-score norms was produced from over 58,000 test scores with the results covering boys of ages 13 to 17 years, in nine tests of physical ability

**Amy Ross (2010)** found that providing quality food that is appealing to students which helps to promote healthy eating. School meal programs play an important role in the nutritional adequacy of students diets. Dietary adequacy is of the utmost importance for students with their nutrient requirements to sustain normal growth and development. He reveals even mild nutrient deficiencies can end with negative long-term effects on growth and function.
Alaimo et al. (2002) also found that family food insufficiency was associated with school-age children’s academic and psychosocial development. These investigators also found that family food insufficiency was associated with depression and suicide attempts in teenagers. They outlined several possible mechanisms for their results that could also be relevant to explaining the relation between meal irregularity and poorer school performance: 1) poorer health status, 2) irritability, distractibility, and emotional changes, 3) anxiety resulting from feelings of deprivation, 4) parental stress, anxiety, and behavior, and 5) family functioning.

Reviews on Academic Achievement and Sports Participation

Mohammad Younis Khan et al. (2012) in their study Sports and academic performance of students has been a topic of debate for years. The supporters of sports program in educational institutions say that participation in sports improves students’ grades, academic achievement, raises their educational aspirations, and keep them in schools and colleges. Critics say that participation in sports deflects time away from the classroom and divert students’ attention from study. They further say that it is not possible for students to achieve excellence and satisfaction in sports as well as in education. A continuing debate about the role of sports and academic achievement of students has occurred since long but no consensus has been reached so far. In this context the present study was conducted to determine the association between participation in sports and academic achievement of students. The study was conducted in Government Colleges of District Dera Ismail Khan, Khyber Pakhtunkhwa. A structured questionnaire on three point Likert scale was developed and utilized for collection of data from 260 respondents (60 teachers and 200 students) selected through random sampling technique. The result of the study revealed that there is link between
participation in sports and performance in education and participation in sports improve the Grade Point Average (GPA), class tests results, ability of students to succeed academically, and mental or cognitive development. This study also confirmed that Sports activities are very useful and helpful for enhancing the academic mission of colleges.

Daley and Ryan (2000) Conducted study on Academic performance and participation in physical activity by secondary school adolescents. 232 boys and girls from Years 8-11 (ages 13-16 years) were randomly selected, and their academic performance was assessed on previous examination scores in English, Mathematics, and Science. Participants were also asked to list all the sports based physical activities in which they normally participated during a typical week and to indicate how many times per week they took part in each activity and the duration of each. Overall, no significant correlations were found, although weak negative correlations were recorded between the amount of time (in minutes) in sport and exercise and English scores for children ages 13, 14, and 16 years. A similar association was also noted for Science scores of children 16 years old.

Daniel I et.al (2010) It has been argued that high school sports participation increases motivation and teaches teamwork and self-discipline. While several studies have shown that students who participate in athletic activities perform better in school than those who do not, it is not clear whether this association is a result of positive academic spillovers, or due to the influence of unobservables. Using data from the National Longitudinal Study of Adolescent Health and a variety of statistical techniques designed to distinguish between these hypotheses, we examine the effect of sports participation on several measures of academic performance. Our results provide only limited evidence that sports participation leads to enhanced academic performance.
Feng S. Din (2005) conducted to determine whether participating in sport activities had any impact on students’ academic achievement in rural high schools. The participating students (N=225) were selected from four rural high school districts. The participants’ immediate pre-season grades in English, math, science and social science were compared with their immediate postseason grades in the same courses. The independent variable was participating in school-sponsored sport activities and the dependent variable was the participants’ postseason grades. The comparisons were conducted on a course-by-course and team-by-team basis. Results of data analyses indicated that no significant differences were found between the students’ pre-season and postseason grades, which suggest that participating in school-sponsored sports activities did not affect the academic achievement for the participating rural high school students.

Ravi Kant and Dr Samir Kumar Lenka (2012) investigated the relationship between parental participation and academic performance or attainment of secondary school children of four districts Rampur, Moradabad, Jyotibaphule Nagar, Bijnor. Parental participation in this study focuses on the involvement strategies implemented by the parents’ in their children’s education at home and at school. Findings of the study suggest that there are significant positive relationship between parents’ involvement and children’s academic attainment. Positive relationship was also found in parental participation and academic performance in some core subjects of children.

Kala Jasmine et.al (2013) studied children who are physically active and fit tend to perform better in the classroom, and that daily physical education does not adversely affect academic performance. Schools can provide outstanding learning environments while improving children’s health through physical education. Obesity is
one of the most pressing health concerns for our children today. More than one-third of children and teens, approximately 25 million kids, are overweight or obese and physical inactivity is a leading contributor to the epidemic. Since students spend a significant amount of time at school or in school-related activities, schools play a central role in providing opportunities for students to engage in regular physical activity. This summary of peer-reviewed research on the relationship between physical activity and academic performance among children and adolescents yields. Studies consistently show that more time in physical education and other school-based physical activity does not adversely affect academic performance.

Mohamedayupkhan M and S. Mani (2014) study aims to find out the level of Students Personal Problems, Study Involvement and Academic Achievement among the higher secondary school students. Sampling techniques were used for the selection of the sample in this case was random sampling technique. A total of 306 higher secondary school students were selected from three different schools in Usilampatti education district. The investigator selected 102 students from government school, Government Aided School, Private school. Results were statistically analyzed through ‘t’ test, and ‘f’ test. Gender has an impact on students personal problems, study involvement and academic achievement.

Chun Cheng Chuan et.al (2013) other evaluated the factors that influence the academic achievement of Malaysian university athletes were investigated using 156 field hockey players from several universities. The relationship between team subculture, parental influence, the learning environment, support systems, financial aid, training factors, academic assistance, socialization, and stress level and academic achievements of student athletes were examined using the Team Socialization Scale
(Allen, 1997). There was a significant positive relationship between the learning environment and academic achievements of university athletes but a negative relationship was found between support system and academic achievements. Implications and suggestions on how to improve the academic achievement of athletes in Malaysian universities were discussed in the study.

Badam Singh (2015) investigated the impact of sports participation on academic achievement and socio-psychological development of Bundelkhand region schools. The subjects for this study were exclusively school children studying in VIII to XI of U.P. Board Schools & Public Schools of Bundelkhand region. Further the subjects were selected randomly from U.P. Board Schools & Public Schools of Bundelkhand region. On the basis of the findings, it was concluded that participation in sports can help student build discipline, set goals, organize time, and develop self-confidence. Sports participation has an impact on academic achievements and sociopsychological developments. It extends the learning of social competence by teaching children to cooperate with their team members as well as with opponents. Sports participation contributes to develop social skills, adaptability, maturity, motivation, leadership, self-control, cognitive, etc. Sportsperson are less prone to emotional and behavioral problems like guilt, isolation, depression etc compare to non-sportsperson. Sports participation is a fun way to learn values and lessons that will last for life time. The study shows that sports participation has implications on social and moral development. It has a positive effect on the students.

Pankaj Kumar Paul, and Sunil Kumar Baskey (2012) in their study attempts to analyze the impact of co-curricular activities of some secondary level school students in Burdwan district of West Bengal. The study covers two hundred students both in
urban and rural areas encompassing students consisting of boys’ and girls’. The whole students (N = 200) were divided into two equal groups: one is experimental and the other is control group. The pre-test and post-test scores were used to evaluate the impact of co-curricular activities on academic score of the students. The present study also covers one hundred teachers and schools’ authorities as well as guardians to find out the relationship between co-curricular activities and academic achievement of students. The results of ‘Chi-square’ test revealed that co-curricular activities have had a significant positive impact on academic level achievement of students.

Daniel I. Rees and Joseph J. Sabia (2007) studied that high school sports participation increases motivation and teaches teamwork and self-discipline. While several studies have shown that students who participate in athletic activities perform better in school than those who do not, it is not clear whether this association is a result of positive academic spillovers, or due to the influence of unobservable. Using data from the National Longitudinal Study of Adolescent Health and a variety of statistical techniques designed to distinguish between these hypotheses, we examine the effect of sports participation on several measures of academic performance. Our results provide only limited evidence that sports participation leads to enhanced academic performance.

Bradley J et.al (2013) investigated the Physical Education and School Sport (PESS) is an integral part of the school curriculum in Ireland. Historically the "Healthy Body, Healthy Mind" philosophy has promoted the inclusion of PESS alongside more cognitive school subjects. Research suggests that PESS can promote cognitive function and provide educational benefits. However, there is little research on how the choice of school sport influences academic achievement. This study investigated how
participation in school sport influences the Leaving Certificate points score in an Irish secondary school. In particular, the study will investigate how the particular sport chosen by students participating in school sport during their Leaving Certificate years influences their Leaving Certificate results.

Shashank Negi et al (2016) explored relationship between physical activity and academic performance have yielded variable results while its effect on body mass index (BMI) is clearer. And he limits the paucity of data on the subject in the Indian subcontinent. He explains the relationship between physical activity and academic performance in children between 12-18 years by assessing the correlation of physical activity with academic performance and BMI and analysing the association of duration of physical activity with academic performance and BMI. A cross-sectional study was carried out involving a questionnaire based interview of 400 students in the age group of 12-18 years. The data was then analysed using correlation and unpaired t test by SPSS software version 14.0. A moderately good positive correlation was observed for physical activity with academic performance with \( r = +0.49 \), whereas a mild negative correlation was observed for physical activity with body mass index with \( r = -0.31 \). A sub-group analysis using unpaired t–test revealed that students indulging in physical activity of more than 1 hour duration had better academic performance and a healthier BMI as compared to students with physical activity less than or equal to 1 hour duration. Physical activity exhibits a positive relationship with academic performance and BMI in the adolescent age group.

Strong et al. (2005) identify a moderate association between greater PE class time and gains in academic test scores. In contrast use quasi-experimental data to evaluate the effects of physical activity. They find that more physical activity lowers
the probabilities of obesity, cardiovascular disorders, and asthma among school-aged youth.

Cawley et al. (2013) find more time spent in PE class does not affect academic test scores. Report that more time spent in physical education (PE) classes reduces the probability of youth obesity, which is a contributor to many health problems among adolescents, such as prediabetes, bone and joint problems. However, another research produces mixed evidence on whether the health benefits of physical activity spill over to academic performance.

Reviews on Motor Fitness and Academic Achievement

Darla M. Castelli et.al (2007) tested on relationship between physical fitness and academic achievement has received much attention owing to the increasing prevalence of children who are overweight and unfit, as well as the inescapable pressure on schools to produce students who meet academic standards. This study examined 259 public school students in third and fifth grades and found that field tests of physical fitness were positively related to academic achievement. Specifically, aerobic capacity was positively associated with achievement, whereas BMI was inversely related. Associations were demonstrated in total academic achievement, mathematics achievement, and reading achievement, thus suggesting that aspects of physical fitness may be globally related to academic performance in preadolescents. The findings are discussed with regards to maximizing school performance and the implications for educational policies.

Shannon Usco Shook (2016) Researchers have reported on the relationship between academic achievement and physical fitness levels. At one rural middle school, 25% of the students enrolled were either overweight or obese and failing at least one
course. Educators at the local site were seeking methods to improve the academic achievement of their students. The purpose of this quantitative study was to examine the relationship between academic achievement and physical fitness of middle school students at the study site. Framed by the theoretical connection between improved physical fitness levels and academic achievement, the research questions examined the relationship between physical fitness levels of 6th grade students (N = 216) as measured by their Presidential Youth Fitness Test (PYFT) and the state-mandated Criterion Referenced Competency Test (CRCT) scores in the areas of mathematics and reading. Findings from correlational analyses indicated small, significant positive relationships between students’ CRCT in mathematics and reading and their PYFT levels. The link between personal fitness and academic achievement should be further explored; researchers should also consider potential moderating variables related to demographics, motivation levels, and educational and community support. Based on the findings of the study, physical educators at the local site should advocate for physical fitness and promote the connection between physical fitness and academic achievement. The implications for positive social change include providing local research findings to the school leadership that may have a positive effect on academic achievement.

**Boespflug (1968)** studied the relationship between physical fitness and academic achievement. Physical fitness of 50 track experienced subjects was measured by the AAHPER youth fitness test and academic achievement was represented by grade point average. Those subjects who obtained high physical fitness scores also had better academic achievement than those subjects with low physical fitness scores.
Jornet (1968) investigated the relationship between physical fitness and academic achievement. Freshman and senior high school boys (N = 358) who ranked in the upper and lower 25 percent of their respective classes were used as subjects. The physical fitness test was constructed by the Maine West Physical Education Department. Class rank was determined by grade point average. No significant differences were found between physical fitness and academic achievement for either freshman or senior boys.

Hays (1963) attempted to study the relationship between physical fitness and academic grades of high school boys. He administered Washington Physical Fitness Test to all male students at Lincoln High School. The boys were divided into four groups on the basis of the Mccloy Classification Index and samples were drawn by lot from each group. Fitness test scores were correlated with average academic grade in each group during the fall semester of 1961. Three of the correlations were positive and the fourth was negative but none was significant at the .05 level. The negative correlation apparently resulted from the high number of seniors who were repeaters in physical education.

Hart (1970) attempted to study the relationship between physical fitness test scores and grade point average for high school students. The average percentile scores obtained on the California Physical Fitness Test were correlated with intelligence quotients and semester grade point average of the 192 male SHS subjects. Subjects were divided into groups according to class level. There was no significant correlation between physical fitness test scores and intelligence quotients; the correlation between physical fitness scores and grade point averages for the sophomore, senior and total groups showed positive but insignificant tendencies, and junior class obtained an r of -.43 (P < .057).
Baker studied the relationship of physical fitness to academic achievement and other variables. The subjects were 74 boys from 12 to 18 years old in opportunity classes in the public schools at Edmonton, Alberta.

Domingos (1961) determined the relationship of selected motor fitness scores of freshmen college women to their academic achievement. He used 643 freshmen college women to determine the relationship between motor fitness as measured by their averages in a battery of tests and academic achievement as measured by their scores on the entrance examination and their grade point averages for the two semesters of their freshman year. Analysis of data did not show any relationship between motor fitness and academic achievement.

Reviews on Nutrition status and Academic Achievement

Cowell’s (1986) The purpose of study was to analyze the relationship between health status and academic achievement. The health assessment measures consisted of parent reported history, teacher assessment, physical examination report, physical fitness tests, and report of absenteeism. The study was conducted in two suburban parochial school. The sample consisted of 191 third and fifth grade students. Academic achievement data and I.Q scores were reviewed. Parent and teacher assessment sources were significantly related to academic achievement before controlling for I.Q. A hierarchical regression analysis was then used to account for the variance explained in academic achievement while controlling for I.Q. While I.Q explained 44.3% of the variance in achievement, the other health variables only accounted for 3.3% of additional variance while controlling for I.Q. While the power of I.Q diminished the significance of health in explaining the variance in achievement, several important questions emerge concerning the findings. The I.Q test was administered as part of the achievement battery.
and might be influenced by this the sample was homogeneous by design because the thesis of the study suggested that health contributed significantly to achievement, even controlling for I.Q. The relationship is obviously not very strong and a heterogeneous sample may illuminate an indirect relationship. The reliability and validity of the assessment measure was not analyzed. Until reliability and validity of health assessment measures is identified, the relationship between health and achievement is not fully explained.

**Zimmerman** (1980) used children (N=237) to study the relationship between health factors recorded in school records and academic performance records in file in the school. Test scores from Scholastic Testing Service (STS) a battery of achievement tests and teachers grades were used for correlation studies with health factors. The result of the co-relational, ex-post facto design study, tested by statistical package for the social sciences (SPSS) showed several significant relationships between academic scores and health factors. The statistical significance of specific health factors indicates the need for further research on health factors as predictors of academic performance.

**Marie** conducted a study to investigate the relationship of adolescent health status to academic achievement. She assessed Health and Physical Characteristics of students by self-administered health questionnaire. Grade point averages and standardized test scores were from the student’s permanent record files, and school absence, attitude toward school, academic self-concept, and socioeconomic status measures were selected from various instruments. Correlation and multiple regression techniques were used to test the hypothesis. The results indicated that health problems associated with problems in educational achievement could be identified and indicated that health data is an integral component in a study of academic performance.
Brown and others studied the health variables and school achievement. Students who failed the Cognitive skills Assessment Battery (CSAB) at the beginning of first grade were compared to those who passed on health factors, health history, family characteristics, socio-economic factors, health ratings by the classroom teacher and the school nurse, and achievement on the Basic Skills Assessment Program (BSAO) at the end of first grade. Significant differences were found on family characteristics, birth history, and health ratings. Only ear problems were significantly related to the academic variables. Health problems were found to be moderately related to academic variables. This relationship was influenced by family socio-economic variables.

Agarwal (1987) revealed that positive and significant impact of iron foliate supplementation for 3 months on physical work capacity and cognitive abilities of the children. Recently Khalifa et al. (2004) and Sen and Kanani (2005) pointed out effect of nutritional status on physical and cognitive performance of undernourished children (low height/age, low weight/age and low head circumstance/age) obtained significantly lower IQ score than well nourished. Many research studies support the significant and positive relationship with socio economic status, nutritional status, level of intelligence and physical fitness in terms of participation in extracurricular activities of the children.

On the whole it is important to note that the relation between nutritional status and Academic achievement positively and significantly correlated with each other. It is highlighted that nutritional status affects level of Academic achievement and participation in extracurricular activities of the children. The present study results also in agree with previous findings. The reason may be that the nature of work of areas of
subjects, and the environment and cultural influence of that region and the food they consume every day.

**Reviews on Motor fitness and nutrition status**

**Eda Mentes et.al (2014)** in this study, it was aimed to investigate the relationship between eating habits and physical activity and to reveal differences in adolescents. A total of 200 children between 13-17 ages were included to the study. As data collection tools, 18-question survey prepared based on expert opinion and Godin Leisure-Time Exercise Questionnaire survey were administered to students. Multidimensional Scaling Analysis technique was used to investigate the relationship between physical activity and eating habits and t-test and Chi-square analysis were used to compare the genders in terms of physical activities. The values of doing breakfast of the students in terms of eating habits were found high. Lunch was observed as the most frequently skipped meal and it was detected that the reason of it was arisen from reluctance and shortage of time. Any statistically significant differences were not found between the girls and boys in terms of the low-intensity exercises. It was observed that the sports done by considering 7 days a week showed significant differences in favor of males according to genders. As a result, besides adequate and balanced diet to achieve the desired quality in basic education, giving importance to physical activity can significantly improve physical fitness features.

**Filipe Soares Ferreira, (2013)** the presence of overweight and obesity in children and adolescents it’s real. Although there is a trend toward the decrease in physical fitness levels, the intensity of this decrease due to the nutritional status in adolescents is not well-known, particularly in school adolescents of inner Portuguese regions. The aim of this study is to describe physical fitness levels, nutritional status
and analyze their association in school adolescents of Castelo Branco district, according to gender. Cardiorespiratory fitness (20 meters shuttle run test), muscular fitness (curl ups, pushups and back arch tests) and nutritional status (body mass index) were carried out in 924 school adolescents (429 males and 495 females) aged between 12 and 17 years old. Descriptive, correlation and covariance analyses were performed. The prevalence ratio was analyzed thought Poisson regression. Curl-ups and back-arch tests are in accordance to healthy fitness zone. Overweight and obese adolescents achieved low cardiorespiratory and muscular fitness levels. No differences were found on back-arch test between body mass status groups. Opposite correlations were found between physical fitness tests with BMI, excepting back-arch test. The prevalence ratios expose a strong trend toward the decrease of physical fitness tests in overweight and obese adolescents. Assessing physical fitness and nutritional status in school adolescents is essential to primary prevention of century diseases. This study alert health care professionals to find and promote solutions that lead young people to be more active and healthy.

Leonardo Nhantumbo et.al (2013) in his study the relationship of nutritional status and motor performance conditional on asymptomatic parasitemia in rural African children. The study aims to determine if malnourished youths from rural African areas have lower levels of physical fitness and physical activity compared to normal weight youths. And he verifies the biological relevance of anthropometric criteria used to classify nutritional status in youth which determines the prevalence of parasitological indicators, and its association with nutritional status and Physical fitness. The sample comprised 794 youths (6-17 years) from Calanga, a rural community in Mozambique. Physical fitness tests were selected from standardized test batteries, and physical activity was estimated by accelerometer. Nutritional status was defined according to
WHO recommendations for stunting, wasting and normal weight. Parasitological indicators were determined based on stool specimens analysis. In general terms the normal group out-performed the other nutritional groups (stunted and wasted) for physical fitness. However, no significant differences were found for physical activity among nutritional groups. There were also no significant differences in prevalence of intestinal parasites. Nutritional status was not associated with Physical activity levels or the prevalence of parasitological indicators in youth, but was related to physical performance.