CHAPTER – I

INTRODUCTION

1.1 INTRODUCTION

The nations of Communities and individuals are benefitted by participating in physical education are sports activities. Children’s participation in sports or physical education activities has great influence. Evidence suggests that from an early age, differences in gender-based attitudes towards and opportunities for sports and physical activities have a significant influence on children’s participation. This may, in turn, affect later involvement in physically active lifestyles, and the social and health benefits that may result for them.

In human life teenage has more emphasized. This period also called changing period from childhood to adulthood. During this period several changes takes place in the body of adolescent girls. Growth evaluation gives information about Health and Nutritional status of an individual in their teenage. In a community teenagers health and nutritional status is considered as the indicator of that community health. Healthy body mass and composition throughout the life is possible by regular exercise combined with a healthy nutrition and it also reduces the risk of various diseases. Motor qualities are maintained by regular Physical activities and also helps in reducing work stress and monotonous. To carry out daily work without undue fatigue and participating in leisure time activity is known as Physical fitness. As per the president’s council on fitness, medical and dental supervision and care, other pretension against disease, proper nutrition and other aspect of healthful living and immunization is called as physical fitness.
Health is a basic resource for individual and society. It is an important aspect to create necessary skills and competency for responsible care for health, especially among children. In this context health education need to be an important part of school curriculum. Along with these aspects physical, motor and mental fitness is important to human mind because every movement, every position and every tension in muscle tendon and joint helps to contribute to formation of concepts and ideas. Physical and motor fitness contributes to the efficient working of muscles and enables the mind to make quick and correct decisions while maintaining control over the emotions. It improves the efficiency of the organism and is essential to the proper functioning and maintenance of all systems of the body. A high level physical, motor and mental fitness is desirable for a full productive life. Sedentary living habit poor physical and motor fitness have a negative impact on both health and daily living and affects mental health. It has been stated that the healthy and citizens of fitness are a nations best assets and weak one its liabilities. Fitness is the prime requirement for any tasks undertaken by any individual in his daily life.

Sports and physical fitness activities are basic to all learning. No learning is purely based on mental or physical. The difference between mental learning and physical learning is one of a degree. The spectrum of learning has many shades, but they are all interrelated. Therefore, the discipline of physical education and sports, which studies the whole person in human movement, is by its very nature also an inseparable entity of reality. Physical and motor fitness is a means to an end and is not an end in itself. The special consideration should be given to health education and physical education, motor fitness, nutritional status, academic achievement and sports participation.
As per the Darwin’s principle of use and disuse Physical activity and participation in sports Strengthens and make the muscle stronger, efficient and helps to get the work done with ease, less effort and less expenditure of energy and without undue fatigue.

So it is very important that children and youngsters are introduced to the principles of training and active participation in theory alongside with practice. Children, adolescence and youth should participate in physical activities for about one to two hours daily, which was concluded by (Astrand et al., 2003).

In the medical report on the Physical Activity and Health, the result shows that physical activities delays the increase of health problems where it lowers the risk of increasing back pain, chronic lung diseases, diabetes, obesity and so many other diseases; such as coronary heart beside developing the mental health (US Department of Health and Human Services, 1996). Adult studies using large samples indicate that obesity is more common among urban samples than among rural samples. However, there has been little direct research on differences in various aspects like nutrition status, motor fitness, socioeconomic status academic performance etc. among urban and rural children.

Urban and Rural Area

Rural areas or the country or countryside are areas that are not urbanized, though when large areas are described country towns and smaller cities will be included. They have a low population density, and typically much of the land is devoted to agriculture. The degree to which areas of wilderness are included in the term varies; very large wilderness areas are not likely to be described by the term in most contexts (Guralnik 1984).
An urban area is characterized by higher population density and vast human features in comparison to areas surrounding it. Urban areas may be cities, towns, but the term is not commonly extended to rural settlements such as villages. Urban areas are created and further developed by the process of urbanization. Measuring the extent of an urban area helps in analyzing population density and urban sprawl, and in determining urban and rural populations.

Research designed to study other issues has led to some information on pediatric overweight among urban and rural children. For example, in a study designed to assess psychiatric disorders among rural youth, researchers found that overweight and at risk for overweight was 3-4 times more prevalent in their rural sample compared to national norms. In a study of pediatric weight status and cardiovascular risk factors, researchers found that 43% of children in their rural sample were at risk for overweight and over 25% were overweight. In a similar study the researchers found that 29.5% of rural children in their sample were overweight. In a study of New York City schoolchildren researchers found at risk for overweight or overweight prevalence rates of 25% in their large sample of urban children. However, a study of body image perception among urban and rural children found no difference in body mass index (BMI) among the urban and rural children. Therefore, the few data that are available on pediatric weight status among urban and rural children are inconclusive.

“In another study a compare on urban and rural children's rates of overweight, the authors found that overweight was more prevalent in rural children (29.5%) than in urban children (21.7%)”

Urban areas have at least one million inhabitants in 2006. In 1800, 3% of the world's population lived in cities, a figure that had risen to 47% by the end of the
twentieth century. In India approximately 60-65% of the population lives in rural areas. In some countries, the percentage of people dwelling in rural areas is even greater. The majority of the rural population is inactive, and strategies to date for promoting regular physical activity have been limited in their effectiveness. Rural residents lack access to opportunities to engage in routine physical activity. This becomes more complex to rural girls with lot of restriction in all aspects of their life.

More than 2.6 million young people aged 10 to 24 die each year worldwide. A much greater number of young people suffer from illnesses which hinder their ability to grow and develop to their full potential. About two-thirds of deaths cases and one third of the total disease burden in adults are associated with behaviors such as tobacco use where there is approximately 150 million young people use tobacco, a lack of physical activity, unprotected sex or exposure to violence, which began in their youth. There is another health cases that affects young people such as malnutrition where in both low and high income countries the overweight and obesity are increasing among young people (WHO, 2011). So nutrition status is also an important factor which should be considered while assessing their other factors like motor fitness, academic achievements and sports participation.

Nutritional Status and Academic Achievement

In an educational world filled with failing schools and apathetic students, state boards of education have searched for answers on how to increase test scores and create school systems where all students receive the best education possible. Amongst the plethora of possible solutions, perhaps they should look first at the nutritional substance of what our school-aged children are eating each day as they struggle through a day of learning.
Nutritional status, which encompasses malnutrition, has a profound influence on educational progress (Pollit 1984). Children who consume insufficient, excessive, or imbalanced quantities of nutrients are more likely to struggle in an academic setting. They are at an educational disadvantage which compounds through the years of childhood and adolescence and can conceivably cause children to have lower levels of aspiration, accomplishment, and even intelligence.

Nutrition is a part of the interdisciplinary approach to health, fitness and performance of an athlete. The importance of nutrition as a contributing factor to success in training and competition has been well recognized, in addition to favorable genetics, desire and proper training. In general, the dietary guidelines for the average population are also applicable to athletes for maintenance of general health, but additional allowances should be considered for event specific fitness, training, performance and recovery.

There is a correlation between nutrition and cognition as well as psychosocial behavior; this relationship has been highly under-researched, but there exists many studies that look at the nutritional benefits of many proteins, vitamins, and food substances as they affect learning and brain function. Our schools have the potential to play a vital role in preparing and sustaining our students’ potential learning abilities and benefitting their social behaviors by supplying nutritious food during school days.

Providing the nation’s low-income youth with nutritious food has been a concern for over a hundred years. To see that food insufficient students were adequately fed, school lunch programs began during the Great Depression of the 1930’s. From the beginning the program had two goals: to make use of surplus agricultural commodities owned by the government as a result of price-support agreement with the farmers and
to help prevent nutritional deficiencies among low-income school children by feeding them nutritious meals. On June 4, 1946 President Truman signed an act known as the National School Lunch Program (NSLP). This was in response to claims that had been made that many American men were rejected from WWII military service due to diet-related health problems. The federally assisted meal program was created to safeguard the health and well-being of the nation’s children and to encourage the Nutrition and Academic Performance.

Malnutrition affects every organ system in the body and causes impairment of physical growth, immune response, and cognitive functioning. Weakened immune systems make children more susceptible to severe and chronic infections which further exacerbate nutritional problems. Thus, malnourishment detracts from school attendance. Additionally, malnourished children suffer from slow rates of brain development, low brain weight, a thin cerebral cortex, decreased numbers of neurons, deficient myelinization, changes in dendritic spines. (Shashidhar 2009). Malnutrition has significant and enduring effects on the neurological development and behavioral capacity of children. Children who do not eat a balanced diet, even for a short time, can develop problems with their physical, emotional, and cognitive development. Research indicates that even mild malnutrition experienced by children during critical periods of growth can impair their behavior and school performance (Hunger Site 1999). Muckraker Robert Hunter (1904) expressed his concern for malnourished children in school. His argument is still valid today that the poverty of any family is likely to be most serious at the very time when the children most need nurture, when they are most dependent, and when they are obtaining the only education which they are ever to receive. Learning is difficult because hungry stomachs and languid bodies and thin blood are not able to feed the brain. The lack of learning among so many poor children

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is certainly due to an important extent, to this cause. It is utter folly, from the point of view of learning, to have a compulsory school law which compels children, in that weak physical and mental state which results from poverty, to drag themselves to school and to sit at their desks, day in and day out, for several years, learning little or nothing.

Children are the wealth of any nation as they constitute one of the important segments of the population. Children in the age group of 5-14 years are often considered as school age. United Nations Educational Scientific and Cultural Organization (UNESCO) since 1972, for the purpose of statistics consider 6-11 years as primary school age and 12-17 years as secondary school age. It is recorded that in India one fifth population comprises of children between 5-14 years, the age group covering primary and secondary school age. The foundation of good health and sound mind is laid during the school age period. So it is basic milestone in the life of an individual and responsible for many changes that take place during later life. Children who fail to grow optimum during this crucial period may not make-up the loss in growth even on excellent diet in later life. Studies have shown that the performance of children, who had earlier suffered from malnutrition, was clearly inferior to that of children who had not gone through malnutrition. Good nutrition is important throughout childhood because under nutrition during the first few years of life decreases adult body size and physical output when the growth rate is high. “The high level of nutritional deprivation combined with heavy burden of disease at young age has negative consequences which will be expressed during adult life. Hence the school age period is nutritionally significant and children are considered to be the special risk group. Malnutrition during this period results in inferior school performance, working ability and physical growth”
A number of diet and nutrition surveys have revealed that majority of school children consume inadequate food stuffs, especially protective foods such as pulses, leafy vegetables, milk and milk products lower than the recommended level. Along with inadequate dietary habits, non-availability of protective foods, low purchasing capacity, illiteracy and ignorance about the importance of nutrition during this period, unsanitary living conditions and prevalence of infectious diseases are some of the main causes of malnutrition. Physical and mental retardations contribute to high mortality among children. It has reported by studies that the measurements of head circumference usually indicates that the brain size which is less among malnourished children. Malnutrition reduces memory, hearing ability and impairs intellectual functioning. (Church and Katigblack, 1991 and Colombo et al., 1992).

The consequences of malnutrition among school age children includes stunted growth, underweight, anemia, iodine deficiency and other health related problems such as malaria, diarrhea, worm and respiratory infection. More than 50 percent of Indian school children suffer from sub clinical under nutrition as indicated by low birth weight for age and 65 percent fall in group which indicates long duration malnutrition. Malnutrition during childhood causes tragic waste of human resources because though the children join the schools at right ageless 50 percent are able complete their school education with poor academic performance. The impact of malnutrition depends on the stage of the child’s development as well as the severity and duration of malnutrition.

Therefore the problem of malnutrition and under nutrition pose a serious threat to growth and development along with poor academic performance, adverse effect on gross motor activities, skilled motor activities, perception, cognition, memory, attention span, language development and inter social relationship, in turn the personality of the
children. Adverse effect on gross motor development will result in poor participation in sport events, clumsiness movements, low quality of motor planning and directionality. Which indirectly leads to poor recognition of the body image, lack of confidence, low self-esteem and exhibit non-social relationship with peers. Delayed fine motor development creates difficulty in writing, drawing, creativity and low performance in other skilled activities. Similarly perceptual disfunction leads to confusion in differentiation of letters, shapes, words and organization of sentences. The deterioration of visual functions and poor organization of higher level may cause delay in following instructions in the class, learning activity and poor extension of sequentially presented materials. On the whole the effect of malnutrition delays physical growth and motor development which have impact on cognitive development resulting in lower intelligence quotient (IQ), impairment in memory, less attention span, deficiency in learning and lower educational achievement.

Early malnutrition among children has known to result in definite handicap, because it may cause irreversible impact on the development. Physical retardation can be clearly visible but mental deficiency caused by severe malnutrition during early life might not be so easily detectable. School age is considered as a dynamic period of growth and development because children undergo physical, mental emotional and social changes.

**Motor fitness and Academic Achievement**

At a time when schools are pressured to devote more time and resources to academics and less to physical education, (Buck, et al. 2008) indicate that programs that promote physical fitness not only improve physical health, but cognitive health and academic achievement as well. Diamond (2009). It clearly stated that physical activity
which improves physical fitness is needed to maintain health and be productive. Cooper and Taras (2003) proposed, "Health and achievement go hand in hand" Reducing time for physical education does not guarantee improvement in academic achievement. Eliminating physical education from our schools to make more time for academics may be detrimental and counterproductive.

Research studies have also demonstrated that physical inactivity adversely influences academic performance (Tomporowski, et.al 2008). Students who are physically active perform better academically than inactive students. The relationship between physical activity and academic performance may be explained by both physiological and psychological mechanisms.

Children must develop basic academic skills to have success in a modern world where technological advances progress at exponential rates. Once students have a solid foundation in reading, writing and mathematics they can use these skills to acquire advanced knowledge in these and any other academic pursuit. Technology has brought the modern world many advantages, but also many challenges. Where it has allowed a greater degree of independence, it has also resulted, somewhat paradoxically, in producing almost as much dependence. For example, the growth in economic output world-wide is the result in mechanization, but the progress that has increased nearly everyone’s standard of living has also resulted in an epidemic of sedentariness. Rather than rely on innate motor capabilities with the attendant health producing effect, modern culture dictates that mobile transportation is the first, and often the necessary choice. The result is less caloric expenditure per day than at any other time in history for the majority of people. Coupled with readily available food items, there is little to wonder about the world-wide rise in obesity rates. A theory of some merit is that as
children become more sedentary with an attendant loss of physical fitness academic achievement suffers. If this is correct, it stands to reason that when regular physical activity is incorporated into early childhood education, academic standing improves (Rennie, K L et.al, 2005).

A recent study indicated that taking time away from traditional educational pursuits during the school day to spend an hour devoted to physical activity will not adversely influence performance of traditional educational skills (Carlson et al., 2008). Other studies showed that the incorporation of physical activity classes actually enhanced academic performance in traditional academic programs. It is interesting; therefore, that the health of the body and the training of the mind should be linked to lifestyles measures such as regular physical activity. In addition to the adverse physiological effects of obesity which is partly attributed to physical inactivity.

Castelli (2007) suggest that physical fitness was positively associated with neuroelectric indices of attention and working memory. Animal studies have demonstrated that physical activity stimulates neural development. The relationship between physical activity and cognitive function by comparing high and low-fit pre-adolescent children. We have observed that Psychological perspective, physically active individuals report higher levels of self-esteem and lower levels of anxiety, which have both interrelated with improved academic achievement.

A meta-analysis conducted on 16 experimental designs reported a positive relationship between physical activity and cognitive function in school-aged children (Sibley & Etnier, 2003). This study demonstrated that physical activity was positively related to various components of cognitive function such as perceptual skills, academic achievement, verbal skills, mathematic skills, memory and academic readiness. This
study demonstrates that physical activity improves general cognitive function which has greater universal application than improvement in one specific skill such as mathematic performance. This study implies that physical activity improves the decision making process which that may lead to an improved overall quality of life. They are at an educational disadvantage which compounds through the years of childhood and adolescence and can conceivably cause children to have lower levels of aspiration, accomplishment, and even intelligence. Research consistently demonstrates that overweight and obese children are more likely to have low self-esteem and have higher rates of anxiety disorders, depression, and distress.

Past literature consistently supports participation in movement and exercise, which leads to the reduction of stress, improvement of emotional state, and helps one to function comfortably (Steinberg, et.al 1998). Brain Gym exercises and balanced movements have been proven to reduce anxiety. Regular physical activity increases the amount of oxygen delivered to the brain, which increases children’s capacity to learn (Galley and Wolfson 2002). Allowing oxygen to flow to the brain enables one to cognitively function and make decisions with childhood obesity becoming a national health problem and physical education classes dwindling, physical health, cognitive functioning, and academic achievement have also become growing concerns (Hessler, 2009).

“Physical activity is linked to lowered risks of obesity, increased cardiovascular fitness, improved health, and academic achievement. Incorporating physical activity during every school day is essential for numerous reasons. Physical activity has physical and mental health benefits”.
Sports Participation and Academic Achievement

Students who are physically active perform better academically than inactive students. The relationship between physical activity and academic performance may be explained by both physiological and psychological mechanisms.

Health and educational professionals believe that physically active students perform better in the classroom. One study found a statistically significant relationship between fitness and academic achievement (Chomitz, et.al 2009). Promoting physical fitness and increasing opportunities for physical activity has implications to support academic achievement. Physical fitness and physical activity have been linked to positive effects on cognition and concentration in the classroom (Etnier, et.al 1997).

The reduction and elimination of physical activity in the school system may adversely impact the goal of promoting academic achievement as recent research has emphasized the positive impacts of physical activity on increasing concentration, mental cognition, and overall academic performance (Alexandra Maldonald, 2015).

Regular participation in physical activity and higher levels of physical fitness has been linked to improved academic performance and brain functions, such as attention and memory. These brain functions are the foundation for learning. Long-term studies have demonstrated that increases in physical activity, resulting from greater time spent in physical education, were related to improved academic performance. Even single sessions of physical activity have been associated with better scores on academic tests, improved concentration, and more efficient transfers of information from short-to long-term memory. Children participating in physical activity are better for able to stay focused and remain on task in the classroom, thus enhancing the learning experience.
In contrast there are many educators and researchers who believe that Physical Education and physical activity positively impact the brain, learning and academic success. For example, three longitudinal studies (Shephard, 1997) in France, Australia, and Canada showed increased time in Physical Education was associated with physical benefits and either improvements or no change in academic performance.

Firstly the study conducted in France involved an increase of required physical activities every afternoon, while the academic instruction was decreased by 26%. The school day was lengthened and included two daily siestas and vitamin supplements. The results demonstrated no difference in academic performance between the experimental group and the controls. However, students in the experimental group were more attentive and displayed fewer discipline problems and had fewer absences than the controls.

Second, The School Health, Academic Performance and Exercise (Shephard, 1997), study involved 519 fifth grade children from seven selected schools in Australia. There was random assignment to one of three programs for 14-weeks: fitness, skill or control. Results demonstrated a larger gain of arithmetic scores for the fitness group despite the reduction in academic time. Additionally, there were no significant intergroup differences for the fitness and skill groups in gains of mathematic or reading skills, despite the reduction in academic time. Finally, the urban and rural schools in Canada included 546 primary school students. This study also demonstrated greater academic performance by the experimental group, with the girls outperforming the boys in academic scores. The details of this study are covered later in the paper.
1.2 NEED FOR THE STUDY

It is hoped that adequate research exists that is readily available to schools and parents so that children have the opportunity to be as nutritionally healthy as possible for optimal brain function, cognitive development, positive social behaviors, and energy to carry out school activities. Few studies have analyzed the rates and correlates of physical activity, nutritional status and academic achievement in economically and geographically diverse populations. The question remains concerning the Interrelationship of Motor Fitness, Nutritional Status, Academic Achievement and Sports Participation of High School Boys in Mysuru district. So the investigator attempts to research that addresses the relevance of Motor Fitness, Nutritional Status, Academic Achievement and Sports Participation of Urban and Rural High School Boys in Mysuru district.

A better understanding of Motor Fitness, Nutritional Status, Academic Achievement and Sports Participation of Urban and Rural High School Boys in Mysuru district may facilitate the development of more targeted sports activity interventions in Mysuru district which was the vital purpose of this study. Hence in this study it has been designed and titled as mentioned below.

1.3 STATEMENT OF PROBLEM

The purpose of the study was to find the “Interrelationship among Motor Fitness, Nutritional Status, Academic Achievement and Sports Participation of High School Boys”.

The school children are easily accessible, capacitive and responsive group hence the present study was conducted with the following objectives.
1.4 OBJECTIVES OF THE STUDY

1. To study the relationship between Nutritional status and Motor fitness among urban and rural high school sports participants.

2. To study the relationship between Nutritional status and Motor fitness among high school sports participants in the urban area.

3. To find out the relationship between Nutritional status and Motor fitness among high school sports participants in the rural area.

4. To find out the difference among different level of Motor fitness and Academic achievement of high school sports participants’ boys.

5. To study the interaction between Motor fitness and the Academic achievement of high school sports participants’ boys.

6. To know the difference among different grades of Nutritional status and Academic achievement of school sports participants’ boys.

7. To study the interaction between Nutritional status and the Academic achievement of high school sports participants’ boys.

1.5 DELIMITATION

1. The present study was delimited to seven hundred eleven (N=711) high schools boys in Mysuru district.

2. The total subjects were randomly selected from urban area schools and rural area schools of Mysuru district. From Urban area school three hundred
seventeen (317) and from rural area school three hundred ninety four (394) students were selected for the study.

3. The present study was delimited to sports participating high schools boys ranging in age between 14-16 years only.

4. The village schools of Mysuru district were considered as rural schools and town schools are considered as urban schools.

5. The present study was delimited to fourteen (14) schools only, i.e. six (06) urban schools St. Joseph High school Mysuru; St. Joseph High school Hunsur, Maharaja Government High school Mysuru; Pushpa Convent, Periyapatna; Government High school, K.R. Nagar; and K T E S High School Bannur; Seven (08) rural schools– Government High school, Mullur, Hunsur Taluk; Government high school Rathnapuri Hunsur Taluk, Dr B.R.Ambedkar High school, Hosakote , K.R. Nagar Taluk; Bharath matha High school, Koppa, Periyapatna Taluk; Government High school Beechanahalli, H D Kote Taluk; Government High school, Hirehalli, H D Kote Taluk; Government High school Hediyala, Nanjangud Taluk ; and Government High school Menasikyathanalli, T Narasipura Taluk.

6. To assess the level of Motor Fitness only Indiana Motor Fitness test was used.

7. Nutritional status was assessed by using National Centre for Health Statistics-Indian Academy of Pediatrics’ (NCHS-IAP) method.

8. To assess Academic Achievement percentage of marks obtained in the previous exam was considered.
9. The present study was delimited to high school boys of Mysore district who participated in any sports activities at school level competitions.

### 1.6 LIMITATION

1. Climatic conditions, the behavior of students and their health conditions, while conducting the tests are beyond the control of the investigator. This is a limitation for the study.

2. Proper care is taken to use the available standard equipment’s and is calibrated before use. The instrumental error may also be a limitation for the study.

3. The tools will be administered to the selected subjects in their respective schools. The moods and the emotional status of the subjects may have influenced their responses to various items. This in turn might have influenced the data gathered.

4. In certain cases where adequate critical literature is not available, only allied literature and peripheral literature will be considered for the study.

### 1.7 DEFINITION AND EXPLANATION OF TERMS

**Interrelationship**

The state of being related or interrelated. The relationship between the variables, the way in which two or more people or things are connected.
Motor fitness

Preparation for performance with special regard for big muscle activity without undue fatigue. It is a qualitative performance involving some degree of personal skill. It is also a more general fitness designation than physical fitness (Clark 1967).

Nutrition

Nutrition is the process by which living organisms obtain food and use it for growth, metabolism and repair, the stages of nutrition include ingestion, digestion, absorption, transport, assimilation, and excretion. Nutrition is very important for body metabolism where it fills a need and ingestion of materials necessary of body metabolism. These materials are energy content and energy releasing and body building materials (Beyer, 1987).

In another definition Jeukendrup defined nutrition as the processes of metabolism, ingestion, digestion, absorption, of food and the following absorption of nutrient materials into the tissue (Jeukendrup et al., 2004).

Nutritional Status

Nutritional status is the condition of the body as it relates to consumption and utilization of food. The nutritional status of a person may be either good or poor. Good nutritional status refers to the intake of a well-balanced diet which supplies all the essential nutrients to meet the body’s requirements. Such a person may be said to be receiving optimum nutrition. (Shubhangini A.Joshi 2002)
Status

The relative position or standing of things or especially persons in a society. Sum of an entity's legal capacity, duties, liabilities, rights, and standing. Relative rank in a hierarchy.

The position of an individual in relation to another or others, especially in regard to social or professional standing (Word Net Dictionary).

Academic Achievement

Academic achievement can be defined as excellence in all academic declines; in class as well as extracurricular activities, it includes excellence in sporting, behavior, confidence, communication skills, punctuality, and assertiveness. The term is used more generally to desirable performance in the subjects of curriculum. (Tang and Thomas, 1977)

For the purpose of the present study Academic Achievement is the academic performance of the subject measured in terms of marks/grades as given in the school record. It was then converted to total percentage of the previous exam in which the candidate has passed.

Academic achievement is defined as “The knowledge attained or skills developed in school subject, usually determined by test scores or by marks assigned by teacher or both” (Good, 1959).

High school

It is a stage in the educational hierarchy where instructions will be imparted from eighth to tenth standard. (World Dictionary 1986)
Status

The relative position or standing of things or especially persons in a society. Sum total of an entity's legal capacity, duties, liabilities, rights, and standing.

The position of an individual in relation to another or others, especially in regard to social or professional standing (Word Net Dictionary).

Sports

Sports in the narrow sense of the word can be defined as competitive activity proper, the specific form of which is a system of competitions, which historically has taken shape mainly in the field of physical culture of a society as a special sphere of identifying and comparing human potential in a unified form of strength, abilities and the skills to use them rationally.

“In the broad sense of the word sport encompasses the competition activity proper special preparation for it and specific relations on the sphere of this activity taken as a whole”

Participation

To have or take a part or share with others in some activity, enterprise or participating any other activity etc. (World Dictionary 1986).

Sports participation

It is participating in any sports activity (Word Net Dictionary). In the context of the present study, sports participation referred to students who took part in the school intramural competitions, inter-school competition, representing school and state in
sports or games in recognized inter institutions and inter-state competitions and also winning the place, if any in such competitions.

**Rural**

Rural areas or the country or countryside are areas that are not urbanized, though when large areas are described country towns and smaller cities will be included. They have a low population density, and typically much of the land is devoted to agriculture. The degree to which areas of wilderness are included in the term varies; very large wilderness areas are not likely to be described by the term in most contexts (Guralnik 1984).

**Urban**

An urban area is characterized by higher population density and vast human features in comparison to areas surrounding it. Urban areas may be cities, towns or conurbations, but the term is not commonly extended to rural settlements such as villages and hamlets. Urban areas are created and further developed by the process of urbanization. Measuring the extent of an urban area helps in analyzing population density and urban sprawl, and in determining urban and rural populations (www.answers.com).
1.8 HYPOTHESES

Considering the review of literature following hypotheses were formulated

H1: There is no significant relationship between Nutritional status and Motor fitness among high school sports participants boys.

H2: There is no significant relationship between Nutritional status and Motor fitness among high school sports participant’s boys in the urban sample.

H3: There is no significant relationship between Nutritional status and Motor fitness among high school sports participants boys in the rural sample.

H4: High school sports participants boys with different Motor fitness do not differ significantly in their Academic achievement.

H5: There is no significant interaction between Motor fitness and area in the Academic achievement of high school sports participants boys.

H6: High school sports participants boys with Nutritional status do not differ significantly in their Academic achievement.

H7: There is no significant interaction between Nutritional status and area in the Academic achievement of high school sports participants boys.
1.9 SIGNIFICANCE OF THE STUDY

The present study may be justified as worthwhile on the following grounds:

1. The present study may throw light on the unique factors that influence sports participation on Academic achievement of high school boys in Mysuru district.

2. The present study may also throw light on the possible differences that exist in sports participation of urban and rural area high school boys. This would further, highlight the dominance of certain factors in relation to sports participation.

3. The present study may throw light on the influence of Motor fitness on sports participation of high school boys in Mysuru district.

4. The present study may also throw light on the possible differences that exist in Nutritional status, Motor fitness and Academic achievement of sports participating urban and rural area high school boys.

5. The results of the study could be used for diagnostic purposes, as sighting devices and for other purposes in relation to enhance sports participation at high school level.

1.10 STATISTICAL TECHNIQUE EMPLOYED

The data collected were later subjected to statistical analysis using descriptive statistics like frequency and percentages, mean and standard deviations. Inferential statistics included in the present study are Cramer’s V, ANOVA-one way and two-way, and Scheffe’s post hoc test. Along with descriptive and inferential statistics, graphical presentations have been depicted wherever necessary.