CHAPTER II
REVIEWS OF RELATED LITERATURE

In this chapter researcher projected the past research which were done by various researchers in the past time in particularly this type of topic. These reviews and literatures were stated very useful for this research. These reviews and literature were gave a path to follow for this research.

The First chapter is a discussion of the background, objectives, limitations and delimitations of the present study. This chapter deals with the review related literature. The primary purpose of the study of research works done in the same field is to understand what type of study has been done and what exactly has been explored before the present research work started. The study of related literature and research work is very essential and important as it provides us proper guidelines. There are many educationists who tried to show the importance of review related literature. The review literature for this study emphasize on procedures used indentify the incidence, occurrence causes and prevalence of sports injuries. The review focuses on a number of different instruments used to identify injuries and it nature. The review of related literature is instrumental in the selection of topic, formulation of hypothesis and deductive reasoning to the problem. It helps to get a clear idea and supports the findings with regard to the problem under study. The research scholar has gone through the available related literature, which are relevant to the present study.

The following review has been selected by the investigator are as:

Sinku  (2012) was to examine the effects of health related physical fitness programmes that are covered in the academic programme of physical education department on the cardio respiratory functions of sedentary students. Fifteen sedentary male students studying in different colleges of the Swami Ramanand Teerth Marathwada University Nanded, Maharashtra, India volunteered to be the subjects for
the study. The mean age, height and weight of these students were 20.3+2.66 years, 172.33+5.99 cm. and 69.29+4.01kg respectively. Resting heart rate, vital capacity, breath holding capacity after expiration and inspiration and respiratory rate were recorded at the beginning of 2009-2010 academic year in this study on all the subjects. The health-related physical fitness programme was administered for twelve weeks, 5 days a week and for 120 minutes a day. Mean scores and standard division were taken and paired t-test was applied. A significant effect on resting heart rate \((t=4.44, p<0.05)\) respiratory rate \((t=4.15, p=0.05)\) and vital capacity \((t=4.30, p=0.05)\) was observed. However no significant effects on breath holding capacity after expiration \((t=0.07)\) & breath holding capacity after inspiration \((t=0.72)\) was observed. In the study it was found that twelve weeks of health-related physical fitness programme resulted in a significant decrease in the resting heart rate and respiratory rate with significant increase in the vital capacity. According to the result, it can be concluded that diet and health-related physical fitness programme in physical education department is not only beneficial to increase the cardio respiratory functions and improve physical fitness of sedentary students but also improve the cardio respiratory functions of players of various sports disciplines and general people. The study provides a platform for further research in the field of physical education.

Sinku (2012) examined the effects of health-related physical fitness programmes on Twenty sedentary male students studying in different colleges of the Swami Ramanand Teerth Marathwada University Nanded, Maharashtra (India) had attended the study voluntarily the mean age of these students were 20.3+2.66, height were 172.33+5.99 cm. the weight were 69.29+4.01 Kg. Tests at the beginning of 2009-2010 academic year in this study, resting heart rate were taken from the sedentary students. The applied programme was planned for twelve weeks, 5 days a week and for 60 minutes a day, as the statistical techniques. Mean scores and standard division were taken and paired t-test was applied. The significant effects on resting heart rate \((t=4.44, p<0.05)\) was found in sedentary students. According to the result, health-related physical fitness programme in physical education department is academic programme. It is not only beneficial to increase the cardio respiratory function and to improve physical fitness of sedentary students but also decrease the heart rate of
students. The study provides a platform for further research in the field of physical education.

Sinku (2012) examined the effects of physical fitness programmes that are covered in the academic program of physical education department on the lung function measured through Vital Capacity of sedentary students. Twenty sedentary male students studying in different colleges of the Swami Ramanand Teerth Marathwada University Nanded, Maharashtra (India) had attended the study voluntarily. The mean age of these students were 20.3 ± 2.66, height were 172.33 ± 5.99 cm. the weight were 69.29 ± 4.01 Kg. Tests at the beginning of 2009-2010 academic year in this study, vital capacity was taken from the sedentary students. The applied training programme was planned for twelve weeks, 5 days a week and 60 minutes in a day, as the statistical techniques. Mean scores and standard division were take and paired t-test was applied. The significant effects of physical fitness training programme on vital capacity (t= 4.30, p=<.05) was found in sedentary students. In the study it was found there is a significant increase in the vital capacity. According to the result, that physical fitness training programme in physical education department is academic programme. It is are not only beneficial to increase the lung function and to improve physical fitness of sedentary students but also to improve the lung functions of players of various sports disciplines and general people.

Singh, More and Jain (2013) conducted the study 150 Rural and 150 Urban collegiate Athletes students from P.E.S College of physical education various colleges of Swami Ramanand Teerth Marathwada University Nanded, voluntary to participate in the health related physical fitness programmes. The age, height, weight, and cardiovascular fitness, of all subjects were measured in physical education department laboratory and Field. Participants were ruined for 12 minutes, and the total distance covered is recorded. Walking was allowed. BMI was calculated by Quetelet equation. The result reveals a statistically significant difference of body mass (t=p<, .05) between rural and urban collegiate students. However the result reveals a statistically significant difference of cardiovascular fitness (t=p<.05) was found
between rural and urban collegiate students. The results of present study showed that health related fitness was better in rural students.

Singh & Bhosale (2011) was to study the effect of anaerobic exercise on blood pressure. Anaerobic Training was planned for six week and four days a week. Study was conducted at swami Ramanand Teerth Marathwada University Nanded. Mean scores and standard deviation were taken and paired t-test was applied. There was No significant effect on systolic Blood pressure (t=1.10, p<.05) and Diastolic Blood pressure (t=1.60, p<.05). It was found that there was significant decrease in blood pressure.

Sinku and Jyoti (2013) The purpose of the study was to examine the effects of endurance training on the cardio respiratory functions of high school students 20 high school students that study in lady Katham Marim School Nahva, Panvel, Maharashtra, India had attended to the study voluntary, the Mean(± ages of these students were 14.03(±2.10) heights were 158.33 (± 4.21) Cm. the weight were 56.20 (± 3.80) K.g. Tests at the begging of 2009-2010 academic year in this study, resting heart rate and respiratory rate were taken from the high school students. The applied training was planned for six weeks 5 days a week and for 60 minutes a day as the statistical techniques. Mean scores and standard division were take and paired t-test was applied. A significant effects on resting heart rate (t=8.86, p<.05) and respiratory rate, (t=4.15, p=<.05) were found in the study. It was found that there was significant decrease resting heart rate and respiratory rate. According to the , endurance training is not only beneficial to increase the cardio respiratory function and to improve endurance ability of high school students but also improve the cardio respiratory functions of players of various sports disciplines, adolescence and childhood.

Patil (2012), was conducted the study on BMI, blood pressure, heart rate, pulse pressure, etc on rural and urban farmers. The study conducted on 60 peoples in two groups thirty subjects of each group. The study conducted in gulbarga district of karnataka state in India. The age group of the target population was 20 to 30 years. The investigator were found out BMI through Anthropometric measurements, pulse pressure arterial pressure, both blood pressure such as systolic blood pressure and diastolic blood pressure measure by blood pressure device heart rate, peak
exercise Heart rate, post exercise heart rate in two groups such as rural and urban sedentary. The results reveal that the BMI incurred significantly less (p<0.05) in rural farmer group compared to urban sedentary group. Significant difference also found in pulse pressure, arterial pressure, both blood pressure such as systolic blood pressure and diastolic blood pressure measured by blood pressure device. Heart rate, peak exercise Heart rate, post exercise heart rate in two groups such as rural and urban sedentary. They also found a negative correlation between BMI and percentage recovery HR. The investigator finally conclude that the rural farmer had less BMI and less increase in peak HR, faster HR recovery after physical activities, enhance in PFI and improve in percentage RHR as compared to urban sedentary group. Results indicate a better cardiovascular efficiency of rural farmer group of Gulbarga District of Karnataka in India as compared to their counterpart.

Roxane (2008) conducted the study on overweight and physical activity in rural and urban children. The study conducted on 1687 boys and 1729 girls from fourth, fifth, and sixth grade classes in schools from urban areas, small cities, and rural areas. The investigator examined physical activity and prevalence of overweight between rural and urban. The physical activity was measured by self-report and BMI was calculated from morphological formula (Height weight). The results reveal that overweight was found to be much more among rural children (25%; P <.001) than urban areas children from (19%) and small cities (17%). Urban children were the more physically active overall. Children from small cities reported more time spent in physical activity compared to rural children. Finally, it was suggested that overweight less in small cities urban children and they engage in more physical activities.

Harrist, et. al. (2011), conducted the study on weight status on 12 schools children. The investigator determined children’s weight status, physical activity, and fitness level, respectively through measure BMI, the modified Self-administered Physical Activity Checklist, and the FITNESSGRAM battery tests. He conducted the study on 237 childrens of 12 schools. Result reveals that 38% of the children (9.2 ± 0.4 years) were overweight or obese. In which fifteen percentage was extremely obese. The respondent spent 91.8 ± 83.8 and 32.2 ± 47.7 minutes time in moderate- and vigorous physical activities. However, obese children spent less time in
moderate physical activity and combined moderate- and vigorous physical activity. Meanwhile 43% of all respondent failed to meet the fitness for muscular strength and Thirty six percent failed to meet it for flexibility. Rural children were higher level of obesity compared to the national average; they had low fitness and thirty percent failed to meet the minimum physical activity Rural children are at a particular high risk for obesity

Abhijeet (2013) studied the effects of selected exercises to achieve health related physical fitness components among sedentary students. The investigator made an effort to find out the effects of selected exercises to achieve health related physical fitness components among sedentary students. Accordingly two groups of sedentary students were targeted for this study; these subjects were classified into control group and experimental group. In each group forty students were taken. The age was 18 to 28 years of the subjects. The data was collected with the help of 12 minute Run & Walk Test for evaluating Cardio-vascular Endurance, while assessing Muscular Endurance one minute Bent Knee Sit Up test was used. Grip Dynamometer Strength Test and Kraus Weber Strength Test were used for measuring muscular strength. However body composition was measured through Body Mass Index. Meanwhile Sit & Reach Test and Bend & Reach Test were utilized for measuring flexibility. The investigator had been taken Bent knee sit ups, Squat thrust, Strudel thrust, Bench press, Pull ups, Depth jump, Side step jump, Vertical jump, Standing broad jump, Split Squat Jump, Static stretching exercises for training which were applied on five physical fitness components. These exercises were divided into three sections as per their characteristics in the training programme for getting better results. It had been hypothesized that, there would be significant effects of selected exercises to achieve Health-related physical fitness with respect to Flexibility, assess through Bend & Reach Test and Sit & Reach Test among sedentary students. The results revealed that significant effects of selected exercises on Flexibility was found out (F=39.23, P<0.05) through Bend & Reach Test and result also revealed that significant effects of selected exercises on Flexibility was found out (F=47.89, P<0.05) through Sit & Reach Test among sedentary students, which means that there was significant effects of training programme of selected exercises on flexibility. It had been hypothesized
that, there would be significant effects of selected exercises to achieve Health-related physical fitness with respect to Muscular Endurance, assess through Bent Knee Sit Ups among sedentary students. The results revealed that significant effects of selected exercises on Muscular Endurance was found out (F=22.31, P<0.05) among sedentary students. It had been hypothesized that, there would be significant effects of selected exercises to achieve Health - related physical fitness with respect to Cardio-vascular endurance, assess through 12 Minute Run & Walk Test among sedentary students. The results revealed that significant effects of selected exercises on Cardio-vascular Endurance was found out (F=73.12, P <0.05) among sedentary students. It has been hypothesized that, there would be significant effects of selected exercises to achieve Health-related physical fitness with respect to Body Composition, evaluate through BMI among sedentary students. But the results revealed that no significant effects of selected exercises Body Composition was found (F=0.002, P <0.05) among sedentary students. It had been hypothesized that, there would be significant effects of selected exercises to achieve Health-related physical fitness with respect to Muscular Strength, evaluate through Kraus Weber Test and Grip Dynamometer among sedentary students. Therefore the results revealed that significant effects of selected exercises on Muscular Strength was found out (F=150.624, P <0.05) through Kraus Weber Test, result also revealed that significant effects of selected exercises on Muscular Strength was found out (F=8.85, P<0.05) through Grip Dynamometer Test among sedentary students, which means that there was significant effects of training programme of selected exercises on Muscular Strength.

Singh (2012) study is to find out the cardiovascular fitness level between rural and urban collegiate students and to determine the level of fitness level among rural and urban students. Eighty Rural and Eighty Urban collegiate sedentary students from Nanded, participated in the study. The age, height, weight, and cardiovascular fitness, of all subjects were measured in PE departmental laboratory and Field. Cardiovascular fitness was assessed using 12 minute run test. Place markers at set intervals around the track to aid in measuring the completed distance. Participants were ruined for 12 minutes, and the total distance covered is recorded. Walking was allowed. BMI was calculated by Quetelet equation. With regards to BMI in rural and urban collegiate students they have obtained mean value were 20.12 and 23.78 respectively, the result reveals a statistically significant difference of body
mass ($t=3.45<.05$) was found between rural and urban collegiate students; Urban collegiate students was found to got more obese as compare than rural collegiate students. With regards to 12 minutes run and walk in rural and urban collegiate students they have obtained mean value were 1357.5 and 13.40 respectively, the result reveals a statistically significant difference of cardiovascular fitness ($t=49.61,p<.05$) was found between rural and urban collegiate students.

Kawrey (2012) compared of personality traits and anxiety behavior and BMI of student athletes and non student athletes with respect to height weight age neuroticism, psychoticism, extraversion and lie scale and. Total 150 non student athletes and 150 student athletes were selected as a subject for the present study. Their age ranged from 21 to 30 years. Those Students participated in minimum intercollegiate tournament have consider for students athletes and those students not participated any sports activities at minimum intercollegiate tournament as consider for non student athletes. For the present study Eysenck personality inventory (1985) was and sport competition anxiety test (Marten, 1977), were utilized. It includes 90 questions of four personality variables and 15 for Anxiety. Data was collected individually through a Eysenck personality inventory from 150 non student athletes and 150 student athletes by contacting from different college of Aurangabad District. E. P.I. were distributed to junior collegiate and senior collegiate volleyball players of Aurangabad instruction were given to the students before filling these inventory by the researcher. To analyze the data t-ratio were used to comprise the BMI, personality traits with respect to psychoticism, neuroticism, and extraversion and lie scale and anxiety behavior between student athletes and non student athletes. The level of significant was set up at 0.05 level of confidence. With regards to BMI significance difference was found out in ($t=2.78$) of Student athletes and non student athletes With regards to psychoticism no significance difference was found out in ($t=1.27$) of Student athletes and non student athletes. With regards to neuroticism of Student athletes and non student no significance difference was found out in ($t=0.36$) of Student athletes and non student athletes. With regards to extraversion of Student athletes and non student no significance difference was found out in ($t=0.36$) of Student athletes and non student athletes.
athletes and non student athletes no significance difference was found out in \( t = 1.94 \) of Student athletes and non student athletes. With regards to Lie-scale of Student athletes and non student athletes no significance difference was found out in \( t = 0.88 \) of Student athletes and non student athletes. With regards to neuroticism of female Student athletes and female non student athletes insignificance difference was found out in \( t = 1.98 \) of female Student athletes and female non student athletes. With regards to psychoticism of Student athletes and female non student athletes no significance difference was found out in \( t = 1.33 \) of female Student athletes and female non student athletes. With regards to Extraversion of Student athletes and female non student athletes insignificance difference was found out in \( t = 1.76 \) of female Student athletes and female non student athletes. With regards to Lie-scale of female Student athletes and female non student athletes significance difference was found out in \( t = 2.00 \) \( P < 0.5 \) of female Student athletes and female non student athletes, female student athletes having more Liar tendency as compared to non student athletes, which means female non student athletes incur significantly more Liar tendency. With regards to anxiety of Student athletes and non student athletes insignificance difference was found out in \( t = 1.85 \) of Student athletes and non student athletes. With regards to anxiety of female student athletes and female non student athletes no significance, difference was found out in \( t = 1.18 \) \( P < 0.5 \) of female student athletes and female non student athletes, female student athletes having less anxious as compared to non student athletes, which means that female non student athletes was found to have got more anxious. Students Athletes reported more injuries due to Anxiety.

**Tuteja (2013)** conducted the study on Isotonic and Isometric training on swimming performance and effects of blood pressure among school swimmers and effect of Isotonic and isometric training on physiology and Swimming performance. In this study total 30 Swimmers were selected; of out of 10 Swimmers of each group. Three groups were targetted such as isotonic , isometric and swimming practicing group, there was no . The 30 swimmers Nanded, participated in the study and their age ranged between 12- 18 years. Training was given to the isometric and isotonic groups only. The data was collected through respondents in the form of different experimental tests in pre and post stagrs. The demographic information about Gender,
age, daily smoking, drug use, etc. was obtained before seeking responses. The Swimming performance test was measure through 150 miters free style swimming and for short duration swimming and 400 miters free style for long duration swimming both test was involved pre and post test. RHR was taken before & after training. Before recording Resting heart rate the subject was instructed to remain lying on their bed to record the heart rate, Heart rate was recorded by the palpation at redial artery per minute. The score was express in number of heart rate per minute. The Respiratory rate of each subject was recorded before & after training. Before recording Respiratory rate the subject was instructed to remain lying on their bed in supine lying position. The tester then record rate of respiration in units per minute by carefully watching the movements of the subjects abdominal. Total number of respiratory movement per minute finally recorded. Among the three groups, the Practicing group was strictly under without having any special activity. The experimental groups were subjected to the experimental treatment. One experimental group was given Isotonic exercises training and the other group was given Isometric exercise training. The training period for the experimental groups was six weeks in the mornings for about 30 minutes for isotonic and isometric group separately, except on Saturdays and Sundays. significant effects of isotonic and isometric exercise on short distance swimming performance among school swimmers. In order to locate the significant effects of isotonic and isometric exercises, L.S.D. post hoc comparison for means difference of effects of isotonic and isometric exercises on short distance swimming performance among school swimmers among three groups of Swimmers reveals significant effects of isotonic exercise had found in Practicing group and isometric group that means significant effects of isotonic exercise on Swimmers. Meanwhile significant effects was found between Practicing group and isometric groups, that means there was significant effects of isometric exercise on Swimmers finally, insignificant effects was found between isotonic and isometric groups. Thus the hypothesis was accepted. The second hypothesis, that there would be significant effects of isotonic and isometric exercises on long distance swimming performance among school swimmers The results of the study revealed significant effects in Practicing group and isometric group found, that means significant effects of isotonic exercise on Swimmers, insignificant effects was found between Practicing group and isometric groups, that means there was significant effects of isometric exercise on
Swimmers and insignificant effects was found between isotonic and isometric groups. Thus the hypothesis of the study was accepted. The third hypothesis that, significant effects of isotonic and isometric exercises on systolic blood pressure on school swimmers, that insignificant effects of isotonic and isometric exercises on systolic blood pressure on school swimmers was found thus, the hypothesis of the study regarding systolic blood pressure was rejected .The fourth hypothesis that, significant effects of isotonic and isometric exercises on Diastolic blood pressure on school swimmers, the insignificant effects of isotonic and isometric exercises on diastolic blood pressure on school swimmers was found thus, the hypothesis of the study regarding diastolic blood pressure was rejected. The fifth hypothesis of that, significant effects of HR on school swimmers, insignificant effects of exercises on heart rate on school swimmers was found thus, the hypothesis of the study regarding heart rate was rejected. The sixth hypothesis that significant effects of isotonic and isometric exercises on systolic respiratory rate on school swimmers, no significant effects of isotonic and isometric exercises on respiratory rate on school swimmers was found thus, the hypothesis of the study regarding respiratory rate was rejected. Finally tuteja concluded that, There would be significant effects of isotonic and isometric exercises on short distance swimming performance among school swimmers. Significant effects of isotonic and isometric exercise on short distance swimming performance among school swimmers. significant effects of isotonic exercise reveals in Practicing group and isometric group that means there was significant effects of isotonic exercise on Swimmers. Significant effects was found between Practicing group and isometric groups, that means there was significant effects of isometric exercise on Swimmers .Insignificant effects was found between isotonic and isometric groups. There would be significant effects of isotonic and isometric exercises on long distance swimming performance among school swimmers. Significant effects was found between Practicing group and isometric group that means there was significant effects of isotonic exercise on Swimmers. Insufficient effects was found between Practicing group and isometric groups, that means there was significant effects of isometric exercise on Swimmers .The last hypothesis that significant effects of isotonic and isometric exercises on occurrence of injuries among school swimmers, significant effects of isotonic and isometric exercises on occurrence of injuries on experimental groups on school swimmers.
Bhosale (2009) review on anaerobic exercise on the cardio respiratory functions on sedentary students. 20 Nanded, Maharashtra, India had attended to the study. The age, height, weight, resting heart rate, vital capacity, respiratory rate, and breath holding capacity of all subjects were measured in PE department. Exercise that use large muscles groups that can be maintained continuously and are anaerobic in nature. These exercises include weight lifting, pull ups, push ups, sprinting, jumping row and strenuous activity. Heart rate was measured by counting radial pulse for a min. The respiratory rate was taken by keeping palm on the stomach and counting the total number of breath for a period of 30 sec. and doubled later on to get the respiratory rates per min. vital capacity was measured by using dry spirometer in liters. Breath holding capacity after expiration of students was tested by an electronic watch. The subjects were instructed to stand erect with legs bended, after getting signal the students exhale air through his nostrils. The total time of air holding of the students was measured in seconds. Similarly breath holding capacity after inspiration of the student was measured by also measured by electronic watch. The subject was instructed to stand erect with legs bended after getting signal the students inhale air through his nostrils. The total time of air holding capacity after inspiration of the students was measured in seconds. significant effects of anaerobic exercise was found in physiological variable with respect to heart rate of Experimental group. no significant effects of anaerobic exercise was found in physiological variable with respect to systolic Blood pressure of Experimental group. Thus the hypothesis of the study was not accepted.

It had been hypothesized that there would be significant effect of anaerobic exercise on Heart rate among sedentary students no significant effects of anaerobic exercise was found in physiological variable with respect to Systolic Blood pressure of Experimental group. no significant effects of anaerobic exercise was found in physiological variable with respect to Breathing holding capacity (inspiration) of Experimental group. no significant effects of anaerobic exercise was found in physiological variable with respect to Breathing holding capacity (expiration) of Experimental group. Thus the hypothesis was not accepted.

Chavan (2013) conducted the study with the effects of Resistance Training to improve Sports Performance related physical fitness components among
PE students. All PE students are good players in Football, Track and field, basketball and Volleyball. The investigator made an effort to find out the effects of Resistance Training to improve Sports Performance related physical fitness components among PE students. Accordingly two groups of students were targeted. The subjects were classified into control group and experimental group. In each group there was forty students was taken for present study. The age of the subject were 21 to 30 years. These tests were utilized for control group for two times, such as pre and post and same as experimental group therefore these tests were used totally four times. The results of study indicates that in 150 yard Dash Run test mean of pre and post test of speed among control group were 7.38 and 7.55 and the SDs were 0.45 and 0.58 respectively. However Experimental group have obtained the mean values 7.47 and 6.48 of pre-test and post-test respectively and standard deviations were 0.49 and the post test was 0.36 respectively and observed in F-ratio was 74.65 which is required to be 3.98 at 1,77df at 0.05 level of significance. There was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to speed among PE students. significant effect of Resistance training to the improvement of sports performance-related physical fitness components with respect to Athletic power ability among PE. The results of study indicates that Standing Broad Jump test mean were 221.3 and 217.4 respectively and the standard deviations were 13.25 and 13.29 respectively However Experimental group have obtained the mean values 229.82 and 240.95 of pre-test and post-test respectively and standard deviations were 12.40 and the post test was 12.56 respectively and observed in F-ratio was 97.34 which is required to be 3.98 at 1,77df at 0.05 level of significance. The results reveal that there was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to Athletic power ability among PE students. Significant effect of Resistance training to the improvement of sports performance-related physical fitness components with respect to work power ability among PE students. The results of study indicates that in vertical Jump test mean were 41.4 and 40.77 (pre and Post) respectively and the standard deviations were 3.29 and 2.97 respectively However Experimental group have obtained the mean values 42.4 and 47.3 of pre-test and post-test respectively and standard deviations were 3.68 and the post test was 4.41 respectively and observed in F-ratio was 53.76 which is required to be 3.98. There
was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to work power among PE students. It was hypothesized that there would be significant effect of Resistance training to the improvement of sports performance-related physical fitness components with respect to Agility among PE students. The results of study indicates that in SEMO Agility test mean Pre & post- test of Agility among control group were 13.27 and 13.15 respectively and the standard deviations were 0.96 and 0.81 respectively. However, Experimental group have obtained the mean values 13.41 and 11.72 of pre-test and post-test and SDS were 0.88 and the post test was 0.64 respectively and observed in F-ratio was 58.52. There was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to Agility among PE students. PE students and athletic requires agility. Resistance training can help PE as well as players strengthen the skills. It was hypothesized that there would be significant effect of Resistance training to the improvement of sports performance-related physical fitness components with respect to Balance among PE. The results of study indicates that in Brass Stick test mean Pre & post-test of Balance among control group were 37.96 and 35.97 respectively and the standard deviations were 4.51 and 4.52 respectively. However, Experimental group have obtained the mean values 39.53 and 46.19 of pre-test and post-test respectively and standard deviations were 5.17 and the post test was 5.20 respectively and observed in F-ratio was 69.59 which is required to be 3.98. There was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to Balance among PE students. It was hypothesis that there would be significant effect of Resistance training to the improvement of sports performance-related physical fitness components with respect to Hand Reaction Time among PE students. The results of study indicates that in Nelson Hand Reaction Time test mean of Pre and post-test of Hand Reaction Time among control group were 0.24 and 0.25 and the SDs were 0.027 and 0.027 respectively. However, Experimental group have obtained the mean values 0.24 and 0.21 of pre-test and post-test respectively and standard deviations were 0.026 and the post test was 0.026 respectively and observed in F-ratio was 17.39 which is required to be 3.98. There was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to Hand Reaction Time among PE students. Hence the sixth hypothesis
of the present study was confirmed. It was hypothesized that there would be significant effect of Resistance training to the improvement of sports performance-related physical fitness components with respect to Foot Reaction Time among PE students. The results of study indicates that in Nelson Foot Reaction Time test mean of Pre & post-test of Foot Reaction Time among control group were 0.28 and 0.29 and the SDs were 0.021 and 0.027 respectively. However, Experimental group have obtained the mean values 0.28 and 0.25 of pre-test and post-test respectively and standard deviations were 0.024 and the post test was 0.023 respectively and observed in F-ratio was 44.59. There was significant effects of Resistance training was found out on sports performance related physical fitness components with respect to foot Reaction Time among PE students. Therefore, the results of the study supports last hypothesis. After completion of the study, 12% PE students reported common injuries during experimental period of which strain and sprain are common in respondent.

**Firdous (2012) studied on** effects of weight training on chest muscle circumference, upper arm muscle circumference, fore arm muscle circumference, thigh muscle circumference and calf muscle circumference. In this study, fifty male students of SRTMU, Nanded, were selected as subjects and where divided experimental group and control group. The experimental group was treated with weight training and no training was given to CG. The duration of training programme was forty two days. The training was administrated on alternative days i.e. three days per week. significant effect of weight training on chest muscle circumference, upper arm muscle circumference, fore arm muscle circumference and calf muscle circumference and in case of thigh muscle circumference no significant effect was found on experimental group when compared with control group. Therefore, the weight training programme designed for this study might not be effective on thigh muscle circumference. The significant effect on subjects of experimental group might be due to the nature of weight training programme designed in the present study for the duration of six weeks.

**Hasmi (2011) studied on** Bamu and Srtmu Football players. The age ranged of Bamu Football players and Srtmu Football players was 15-30 year. The data was collected with the help of Eysenck personality inventory. This inventory provides
four psychological dimensions viz; Neuroticism, Extraversion, Psychoticism and Lie-scale. The mean (S.Ds.) age of Bamu Football players was 22.33 (5.26). Their weight was 65.88 (14.59) Kg. and their height was 167 (25.90) cm. Meanwhile the mean (S.Ds.) age of Srtmu Football players was 24.07 (7.78), their weight was 68.32 (18.06) kg and their height was 171 (26.04) cm. It was hypothesized that no significant difference of personality characteristics with respect to neuroticism between Bamu Football players and Srtmu Football players. The results of the study, revealed the existence of statistically significant difference of personality characteristics with respect to neuroticism was found (t = 3.19, P < .05) between Bamu Football players and Srtmu Football players. Bamu Football players was found to have got more neurotic tendency as compared to Srtmu Football players. The results of the study, revealed the existence of statistically significant difference of personality characteristics with respect to psychoticism was found (t= 2.99, P < .05) between Bamu Football players and Srtmu Football players. Bamu Football players was found to have got more psychotic than Srtmu Football players. Which means that Srtmu Football players incur significantly less psychotic tendency as compared to their counterparts. This may be due to the age difference between players. significant difference of personality characteristics was found ( t = 2.80, P < .05) between Bamu Football players and Srtmu Football players. Srtmu Football players was found to have got less extrovert than to Bamu Football players. This may be due to maturity difference between Bamu Football players and Srtmu Football players. no statistically significant difference of personality traits with respect to lie-scale. Significant difference of personality characteristics with respect to extraversion was found (t=3.33, P < .05) between Bamu Football players girls and Srtmu Football players women players. Which means that Srtmu Football playerâ€™s women player incurs less significantly extrovert tendency. statistically significant difference of personality characteristics with respect to psychoticism was found (t= 4.01, P < .05) between Bamu Football players girls and Srtmu Football players women players. Srtmu Football players women was found to have got more psychoticism tendency as compared to Bamu Football players girls players. Which means that Bamu Football players girls players having less psychoticism tendency as compared to their counterparts. This may be due to the age difference. . It was hypothesised that no significant difference of personality traits with respect to extraversion of Bamu
Football players girls and Srtmu Football players women players. The results of the study indicated that statistically significant difference of personality characteristics with respect to extraversion was found \((t=3.25, \ P < .045)\) between Bamu Football players girls and Srtmu Football players women players. Srtmu Football players women players was found to have got less extrovert tendency as compared to Bamu Football players girls players. Thus the hypothesis was not accepted.

The significant difference of personality traits with respect to lie-scale was found \((t = 2.78, \ P < .05)\) between Bamu Football players girls and Srtmu Football players women players. Bamu Football players girls players more liar as than to Srtmu Football players women players.

**Singh and Bhosale (2012)** was to study the effect of anaerobic exercise on blood pressure. Height was 169.6 and weight were 60.05kg. The Anaerobic Training was planned for six week and four days a week. Study was conducted at swami Ramanand Teerth Marathwada University Nanded. There was No significant effect on SBP (Systolic blood pressure) \((t=1.10, \ p<.05)\) and DBP (Diastolic Blood pressure) \((t=1.60, \ p<.05)\). It was found that decrease in blood pressure due to above exercise. All the subject was tested for Blood pressure. The data collected was analyzed by t- ratio with the level of significances set at 0.05. With regards to selected physiological variable in Systolic Blood pressure in Experimental group they have obtain the mean value of 125.9 and 120.7 respectively which are given in the result shows that Not significant effects of anaerobic exercise was found in \((t = 1.10)\) physiological variable with respect to systolic Blood pressure of Experimental group. With regards to selected physiological variable in Diastolic Blood pressure of Experimental group, they have obtain the mean value of 74.25 and 70.2 respectively which are given in the Table -2 shows that no significant effects of anaerobic exercise was found in \((t = 1.60)\) physiological variable with respect to Diastolic Blood pressure of Experimental group. It had been hypothesised that there would be Not significant effect of anaerobic exercise on Blood pressure among sedentary students. Not Significant effects of anaerobic exercise were found in physiological variable with respect to Blood pressure of Experimental group. Thus the hypothesis was not accepted.
Sarode (2012) study on Physical fitness and BMI in rural and urban collegiate students they have obtained mean value were 21.12 and 23.78 respectively, the result reveals a statistically significant difference of body mass \((t=2.70<.05)\) was found between rural and urban collegiate students; Urban collegiate students was found to got more body index as compare than rural collegiate students, which means that rural collegiate students incur significantly less obese as compare than their counterparts. With regards to pull ups in rural and urban collegiate students they have obtained mean value were 7.81 and 0.99 respectively, the result reveals a statistically significant difference of body mass \((t=<.05)\) was found between rural and urban collegiate students; Urban collegiate students was found to got more pull ups as compare than rural collegiate students, which means that rural collegiate students incur significantly less upper strength as compare than their counterparts. With regards to sit ups in rural and urban collegiate students they have obtained mean value were 24.16 and 20.31 respectively, the result reveals a statistically significant difference of body mass \((t=<.05)\) was found between rural and urban collegiate students; Urban collegiate students was found to got more sit ups as compare than rural collegiate students, which means that rural collegiate students incur significantly less Muscular strength as compare than their counterparts. With regards to sit&reach in rural and urban collegiate students they have obtained mean value were 30.56 and 33.43 respectively, the result reveals a statistically significant difference of sit&reach \((t=2<.05)\) was found between rural and urban collegiate students; Urban collegiate students was found to got less sit&reach as compare than rural collegiate students, which means that rural collegiate students incur significantly more flexibility ability as compare than their counterparts. With regards to right hand grip in rural and urban collegiate students they have obtained mean value were 34.77 and 30.06 respectively, the result reveals a statistically significant difference of right hand grip \((t=<.05)\) was found between rural and urban collegiate students; rural collegiate students was found to got more right hand grip as compare than urban collegiate students, which means that rural collegiate students incur significantly more right hand grip as compare than their counterparts. With regards to left hand grip in rural and urban collegiate students they have obtained mean value were 32.80 and 32.71 respectively, the result reveals a no statistically significant difference of left hand grip \((t=)\) was found between rural
and urban collegiate students. With regards to 9 minutes run and walk in rural and urban collegiate students they have obtained mean value were 1357.5 and 13.40 respectively, the result reveals a statistically significant difference of \( t=p<.05 \) was found between rural and urban collegiate students. Rural collegiate students was found to got more aerobic fitness as compare than urban collegiate students, which means that rural collegiate students incur significantly more aerobic fitness as compare than their counterparts. Statistically significant difference of body mass was found between rural and urban collegiate students. Urban collegiate students was found to got more body index as compare than rural collegiate students. Statistically significant difference of body mass was found between rural and urban collegiate students. Urban collegiate students was found to got more pull ups as compare than rural collegiate students. Statistically significant difference of body mass was found between rural and urban collegiate students. Urban collegiate students was found to got more sit ups as compare than rural collegiate students. Statistically significant difference of sit&reach was found between rural and urban collegiate students. Urban collegiate students was found to got less sit&reach as compare than rural collegiate students. Statistically significant difference of right hand grip was found between rural and urban collegiate students. Rural collegiate students was found to got more right hand grip as compare than urban collegiate students. No statistically significant difference of left hand grip was found between rural and urban collegiate students. Statistically significant difference of \( t=p<.05 \) was found between rural and urban collegiate students. Rural collegiate students was found to got more aerobic fitness as compare than urban collegiate students. Finally conclude that urban students have lower levels of fitness compared with rural students.

**Sinku (2014)** find out the difference of positive and negative mental between PE and sedentary students. 150 PE and 150 sedentary students from Swami Ramanad Teerth Marathwada University had been selected for the present study. Their age ranged from 18-30. Questionnaires were distributed physical and Sedentary students. Instructions were given to the both group students before filling these questionnaires by the researcher. To analyzed the data, \( t \)-ratios was comprised the status of mental health between physical and sedentary students. For the present study, Mental health was measured by \( GHQ -12 \). The 12-item GHQ-12 comprises six \( \text{positive} \) and six
negative items. While comprised of positive mental health, significant difference of mental health found between physical and sedentary students with regards to been feeling reasonably happy (t=p<.05), however insignificant differences were found in Been able to concentrate, Plying a useful Part, Been able to enjoy and Been able to face up. While considering negative mental health, the result reveals that there was significant differences of mental health found between physical and sedentary students with regards to Lost much sleep (t=p<.05), Under strain (t=p<.05), and Yourself as a Worthless (t=p<.05), However insignificant differences were found in Couldn’t overcome, Unhappy & depressed, and Been losing confidence. The common belief that PE students lead to better physical and mental health then sedentary students. PE students actively engage in various physical and sporting activities during their studies however sedentary students not engage in various physical and sporting activities during their studies. Result reveals that there was significant difference between mental health with regards to been feeling reasonably happy (t=2.82, p<.05) PE students was found been have got more feeling happy as compare than sedentary students. However insignificant differences were found in Been able to concentrate, Plying a useful Part, Been able to enjoy and Been able to face up. Result reveals that there were significant differences of mental health with regards to Lost much sleep (t=2.62, p<.05), Under strain (t=2.11, p<.05), and Yourself as a Worthless (t=2.21, p<.05), which means that there PE was found been feeling reasonably happy. However insignificant differences were found in Couldn’t overcome, Unhappy & depressed, and Been losing confidence. Significant differences was found between positive mental health with regards to been feeling reasonably happy, However insignificant difference were found in Been able to concentrate, Plying a Useful Part, Been able to enjoy and Been able to face up. Significant difference was between mental health with regards to Last much sleep Under strain and Yourself as a Worthless which means that there PE was found been feeling reasonably happy. However insignificant differences were found in Couldn’t overcome, Unhappy and depressed, and Been losing confidence. Finally, the results of the study were expected to be of great use and importance to the students as the same can be utilize in formulating the modalities in putting their knowledge acquired through developed scientific investigations, analysis and interpretation of findings to use of all type of students.
Sinku . (2012) examined the effects of health-related physical fitness programmes that are covered in the academic program of physical education department on the cardio respiratory functions of sedentary students. Twenty sedentary male students studying in different colleges of the Swami Ramanand Teerth Marathwada University Nanded, Maharashtra(India) had attended the study voluntarily, the mean age of these students was 20.3 ± 2.66, height was 172.33 ± 5.99 cm. the weight was 69.29 ± 4.01 Kg. Tests at the beginning of 2009-2010 academic year in this study, resting heart rate vital capacity, breath holding capacity after expiration and inspiration and respiratory rate were taken from the sedentary students. The applied program was planned for twelve weeks, 5 days a week and for 90 minutes a day, as the statistical techniques. Mean scores and standard division were taken and paired t-test was applied. The significant effects on resting heart rate (t=4.44, p<.05), respiratory rate (t=4.15, p<.05) and vital capacity (t= 4.30, p<.05) were found in sedentary students. However, no significant effects on breath holding capacity after expiration (t=.07) & breath holding capacity after inspiration (t=.72) were found. In the study it was found, that there is a significant decrease resting heart rate and respiratory rate however, significant increases in the Vital capacity.
**Colakoglu, F.F. (2008)** determine the effects of a 12-week callisthenic exercise program on some physical and physiological parameters of young, middle-aged and menopausal women., during 12 weeks, 172 subjects' age, height and body weight means were determined. Physical characteristics of Group I were (between 19–30 years) 26.72 ± 3.57 years, 158.18 ± 4.66 cm and 71.45 ± 10.32 kg, for Group II (between 31–44 years) were as 41.43 ± 4.69 years, 156.94 ± 5.27 cm and 73.89 ± 10.66 kg, and Group III (between 45–56 years) were as 50.60 ± 4.05 years, 154.45 ± 4.18 cm and 75.51 ± 11.71 kg, respectively. All subjects attended the study, 50 minutes per session, three sessions per week, aerobic and calisthenic exercise programs. The intensity of the exercise was determined by Karvonen method (60 or 70%). There were significant differences in increase among aerobic power, sit-up, push-up, and handgrip strength values in Groups I, II and III. There was a significant difference among Group I, II and III in decreased blood pressure (p < 0.05). It was determined that physical fitness values had decreased as the age increased. As a result, it can be said that the long-term callisthenic exercises cause the similar positive changes on women at different ages.

**Shephard and Lavallee. (1994)** the study was conducted on primary school students in an experimental group were subjected to an additional hour of physical education each day compared to a control group, who received a single period of 40 minutes non-specialist education. The additional physical education in the experimental group was provided by a specialist educator, and as a consequence the experimental group received 14% less academic instruction than the control group. Academic performance was provided as a mean of annual scores obtained in French, English, Maths, Science, and overall conduct. Results showed that girls gained a larger academic advantage than boys from the additional physical education provided in the experimental group. Children in the experimental group had significantly higher academic performance than controls in grades.
**Sallis et.al. (1999)** the study was conducted for elementary school children, spending more time in physical education did not have harmful effects on academic achievement when measured using a standardised test. The 2-year follow-up of the physical education program showed pupils in the experimental group did significantly better in achievement tests when compared to controls.

**Dwyer et.al. (1983)** the study was conducted on total of 519 ten year old south Australian school children took part in The School Health Academic Performance and Exercise (SHAPE) study, which involved 45-60 minutes of additional physical education each day. The findings from the study indicated health benefits from daily physical activity. There was no evidence of any loss of academic achievement, measured by arithmetic and reading tests, despite less time dedicated to classroom teaching.

**Ahamed et.al. (2007)** In this study 50 minutes of additional physical activity per week (i.e. 10 minutes per school day) was administered to children in grades 4 and 5 at intervention schools. After 16 months the results of a standard academic test did not significantly differ between intervention and control schools, despite the intervention group losing academic lesson time (P<0.05) Ten minutes per day of additional physical activity may not have been long enough to elicit any academic benefits, but it is sufficient to provide health advantages to the children (WHO, 2010). The study is widely applicable as a simple intervention, as it was designed to supplement the existing Canadian curriculum, and was conducted by generalist teachers who received additional training and resources.

**Coe et.al. (2006)** The study was conducted in American middle school children, found that academic achievement was not related to enrolment in physical education, but interestingly it was associated with the total amount of vigorous activity performed by the children. Subsequent analysis of a 55 minute physical education class revealed that only 19 minutes of this time was spent in moderate to vigorous activity, and it was suggested that this was not
sufficient vigorous activity to impact on academic achievement. It could be that a threshold activity level is required to positively influence academic achievement from analysing these longitudinal physical education interventions, it has been suggested that as a result; academic performance matches or exceeds that of controls. Children receiving additional physical education appear to show accelerated psychomotor development, which could provide a mechanism for accelerated learning of academic skills.

Shephard. (1997) conducted study on total of 546 Canadian primary school children participated in a quasieperimental study, where the impact of an additional hour each day of vigorous physical education, taught by a professional instructor was investigated. The control groups were from classes immediately above and below the experimental group, who received 40 minutes per week of physical education from their academic teacher. Despite the experimental group receiving 14% less academic instruction, their academic performance significantly increased relative to controls. In the initial months of the intervention, the experimental group experienced accelerated development of various psychomotor skills such as perception, though control students caught up later into the study.

Gabbard. (1993) the study was conducted on immediate, short term responses to physical activity were monitored in 120 male and female, grade 6 school children. Participants walked for 20-40 minutes depending on the trial allocated, followed immediately by a 90 second maths computer test. This was carried out 3 times a day for 3 weeks. Improved mathematical performance was witnessed immediately following 20-40 minutes of afternoon walking, although no significant difference was noticed when performing the same intervention in the morning. This suggests that physical exertion may help to sustain appropriate cognitive functioning in the afternoon.

Budde et.al. (2008) study showed that attention and concentration are enhanced following acute bouts of either co-ordinative exercises or normal sport lessons provided in physical education class in adolescent children. A
total of 115 pupils aged 13–16 years of an elite performance school were randomly assigned to an experimental and a control group and were tested for attention and concentration. Both groups performed the attention and concentration test after a regular school lesson (pre-test) and then after either 10 minutes of co-ordinative exercise (experimental group), or following a normal sport lesson (control group). Concentration and attention task scores were higher following either coordinative exercise or a normal sport lesson, in comparison to following a regular school lesson. Larger test score improvements were observed in the co-ordinative exercise group in comparison to the normal sport lesson group, though heart rate was similar in both groups. The authors suggested that the co-ordinative component of the exercise may explain the significant performance differences. Co-ordinative exercise may activate parts of the brain responsible for attention and concentration.

Jarrett et.al. (1998) In this intervention study, a break-time period was introduced once a week at an American primary school which was normally opposed to such practice. A total of 44 boys and girls were their own controls on non-break-time days, and were assessed in classroom behaviour areas of working, fidgeting and listlessness. Over half (60%) of the participants (including those with attention deficit disorder) benefitted considerably, working more, fidgeting less, or both, on break-time days. The authors suggested that the break-time period serves a positive purpose in the primary school curriculum, contrary to the practice of minimising recess in many schools across North America and the UK.

Hillman et.al. (2009) examined the impact of 20 minutes of treadmill walking at 60% maximum heart rate, followed by cognitive testing, on 20 preadolescent children. The results showed an improvement in response accuracy and academic achievement on the exercise trial relative to a resting control trial. The findings indicated that single, acute bouts of moderately-intense aerobic exercise (i.e., walking) may improve the cognitive control of
attention in preadolescent children, and further supports the use of moderate acute exercise as a contributing factor for increasing attention and academic performance. However, there was no increase in arithmetic performance following exercise.

**Caterino and Polak. (1999)** experimental study investigated the effects of directed physical education activities and classroom activities on concentration levels of second, third, and fourth grade children. The physical activities group performed 15 minutes of walking and stretching in the gymnasium before completing a concentration test. The classroom activities group went straight from class to take the concentration test. The authors discovered that children in grade 4 experienced an immediate increase in concentration following 15 minutes of directed physical activity, whilst no detrimental effects were observed on the remainder of experimental participants from grades 2 and 3. It was suggested that the absence of improvement in grades 2 and 3 may indicate that development is a factor in concentration ability, and that the type of physical activity may influence the effect on concentration levels.

**Cooper et.al. (2010)** conducted study on total of 45 British adolescent school children performed visual search and attention tests before and after 10 min of jogging/walking exercise at an average heart rate of 172 beats.min-1. At 60 minutes after the exercise intervention the response times were faster after the exercise intervention, but the effect on accuracy was equivocal. The mechanism by which exercise may improve cognitive function is possibly increased blood flow to, and greater arousal of, the brain (Shephard, 1997). The brain may also benefit indirectly from physical activity due to time away from study, providing boredom relief and consequentially higher attention levels when returning to classroom instruction. As a review on exercise and child cognition by Tomporowski et al (2008) highlights, several experiments, provide evidence to suggest that physical activity induces specific, not global, effects on children's cognitive function. Not all areas of cognitive processing
experience improvement with physical activity, but the literature certainly indicates that physical activity can positively impact on both specific cognitive processes (perceptual skills, concentration, response time) and general learning behaviour (fidgeting, disruptive behaviour). There is no evidence to suggest any negative effects on learning behaviour from conducting physical activity beforehand. However, further research is needed to establish the optimal intensity and duration for cognitive stimulation in young people.

Dwyer et.al. (1983) conducted study in South Australia, 500 pupils participated in the SHAPE trial, which added 1.25 hours of endurance fitness training each day to the school programme for 10-year olds. The control group continued the normal curriculum receiving academic instruction while the experimental group participated in training. A two year follow-up indicated beneficial effects on teacher's ratings of classroom behaviour in the experimental group relative to controls. The Qualifications and Curriculum Authority survey into the effects of physical education and school sport (2001) This UK-based study reported (as a result of survey findings) that physical education and school sport had made successful contributions to behavioural improvements and that negative behaviour and exclusions were on the decline. This trend was identified as a direct consequence of more structured and purposeful active break-times and opportunities to practice skills linked to the physical education curriculum.

Mahar et.al. (2006) were conducted on unique physical activity programme was both simple and effective at improving school behaviour, therefore creating both physiological and psychological advantages for the participants. A 12 week classroom-based physical activity intervention with the primary aim of monitoring the resultant on-task behaviour during academic instruction was conducted on 243 children. The intervention group was subjected to energisers, short classroom-based physical activities lasting 10 minutes and consisting of grade appropriate learning resources. This enabled the children to increase daily physical activity while still under academic
instruction. The energisers required no equipment and little preparation. On-task behaviour generally improved following the energisers (improvement in on-task behaviour by 8% 22 compared to pre-energisers, P=0.017), though the most disruptive children showed even greater behavioural improvements (20% increase post energiser activity). The intervention group also took more in-school steps (assessed via pedometer). In this study children remained in the classroom, but performed physical activity combined with academic work, which also increased on-task behaviour (by up to 20%), suggesting it is not the environment, but the physical movement which promotes the on-task behaviour.

**Barros et.al. (2009)** conducted on amount and duration of breaks from academic study varies widely between schools in both the UK and North America. A large cross-sectional study of over 10,000 U.S children aged between 8 and 9 years old examined each pupil's rating of classroom behaviour (as assigned by their teacher) and the amount of recess permitted by the school they attended. Classroom behaviour scores were higher for children with recess in comparison to those with either no breaks or minimal breaks. However, a dose response effect was not observed for those experiencing various recess durations. Socioeconomic status was also associated with behaviour, with lower SES individuals having lower classroom behaviour scores. Those who received no recess were much more likely to be from lower socio-economic backgrounds which limits the significance of the findings of the study.

**Pellegrini et.al. (1995)** conducted on several studies have shown that student's on-task and classroom behaviour was superior following a period of recess (break). Similarly children became more fidgety and inattentive on days when recess was not permitted or was delayed and after the recess period, students were more attentive and less fidgety. Despite such research being conducted on individual schools and limited sample sizes, the coherence of findings suggests that recess may play a part in increasing class behaviour. In Pellegrini & Davis (1993) and Pellegrini et.al. (1995) however, children
involved with the studies were accustomed to having recess and so the anticipation caused by delaying recess may lead to increases in fidgeting and inattentiveness. In contrast, 23 similar positive findings were observed by Jarrett et.al. (1998) in a school which did not include recess during the school day except during the intervention. Thus, being confined to a classroom for continuous instruction appears to lead to an inattentive state and less efficient work.

Melnick et.al. (1992) was conducted on sports participation was associated with a lower drop-out rate from school in a study of 3,686 African-American and Hispanic students, although no relationship between academic attainment and sports absenteeism from school, but only in females.

Welk. (2009) this study was conducted a total of 2.4 million Texas students in grades 3-12 took part in a series of Fitnessgram tests during 2007-2008. One of the outcomes from the data analysis was that, higher physical fitness achievement was associated with better school attendance rate remained true after controlling for potential confounding variables including socio-economic status, ethnicity and school size.

McKenzie et.al. (2004) This study was conducted two-year intervention study involving a physical education curriculum change showed a small increase in moderate and vigorous physical activity over control subjects, but no effects on enjoyment of PE or attendance in classes according to follow-up student surveys. However, the authors suggested that in the particular school used, the baseline levels for enjoyment of PE and attendance were particularly high, leaving little room for improvement.

Houlihan et.al. (2009) The study was conducted on School Sport Partnership (SSP) programme initiative in England was central to the Labour Governments Physical Education, School Sport and Club Links national strategy, which set out to address participation, inclusion, and coherence between sporting opportunities. Joining this partnership meant additional funding was provided each year so the school could increase sporting
opportunities for all. The vast majority of English schools participated in the programme and the impact of the scheme was assessed by the Loughborough partnership (2009).

Jeanes et.al. (2009) study was conducted on school-based programme supported by the Cricket Foundation aimed to provide greater access to cricket at an all-inclusive level. An external, well qualified coach would come into the school every week to teach cricket to the children. Beyond the obvious impact on PE provision in schools, responses from a pupil survey indicated that significantly more pupils looked forward to school and enjoyed attending when 'Chance to Shine was taking place than when it was not (53% and 36% looking forward to school respectively).

Eley et.al. (2001) was conducted a nation-wide government initiative to encourage citizenship in young people by providing volunteering opportunities in the community. A sub-sample of the initiative focused on young sport leaders (n= 306) across England who were assessed on their motives and attitudes to volunteer work, and their perceptions of leadership skills over 9 months. Leadership skills and volunteer motivations increased while the importance of, and attraction to, volunteering also changed over time (i.e. good citizenship). The study highlighted the advantage of using sport and volunteering for encouraging pro-social behaviour and citizenship, resulting in a positive impact on the volunteer.

Kay, T., & Bradbury, S. (2009) A determination was made of whether any change occurred in the self-concept of children in the open space environment as compared to the change of self-concept of children in a self-contained environment. A total of 216 children, part from an open space environment school and the others from self-contained classrooms at grade levels with one teacher per grade level, were administered the Self-Social Symbols Tasks and the Children's Self-Social Constructs Tests. From the data collected, it was concluded that: 1) children in open space have greater identification with the group than the children in self-contained classrooms; 2)
children in open space have an increase in self-esteem while children in self-contained classrooms demonstrated a loss; 3) children in open space do not view themselves differently in the relationship of their size to that of an adult; and 4) children in open space do not identify with any one particular teacher.

**Shu-Chen Cheng. (2005)** conducted the study on 150 fourth to sixth graders of whom 50 were asthmatic and 100 were healthy, were purposively selected from a pediatric allergy outpatient clinic in a medical center in northern Taiwan. The research tools included a structured questionnaire, the Ŧ Self Concept Scale and the Ŧ Parenting Style Scale. Data were analyzed by descriptive and inferential statistics using SPSS for Windows/PC10.0 software and StatXact-5 statistical software. Significant difference between the self concept of asthmatic and healthy schoolchildren. Asthmatic children’s overall self concept (p<0.001), self concept family subscale (p<0.05), and self concept physical subscale (p<0.001) were lower than those of healthy children. Asthmatic children’s limits in physical education class were significantly correlated with overall self concept, whereas the overall self concept was highest for children with full class attendance (p<0.05) and no shortness of breath after exercise (p<0.01). After modifying for the group effect, the parenting style and overall self concept were positively correlated (p<0.001). Conclusions : These research results can serve as guidelines for medical care professionals, parents and teachers, in caring for and teaching asthmatic and healthy school children.

**Meyer, Charles. (2010)** was to investigated Turkish and American undergraduate students' academic motivation and academic self-concept scores regarding the years that they spent in university. The analysis was based on 566 (284 Turkish, 282 American) undergraduate students where, Academic Motivation Scale and Academic Self- Concept Scale were used as measuring instruments. The results showed that there was a statistical significant effect of nationality and number of years spent in university on undergraduate students' intrinsic motivation, extrinsic motivation, and self-concept scores. Turkish
students had higher intrinsic scores whereas American students had higher extrinsic scores and more positive academic-self concept compared to Turkish partners. Regarding grade level, senior students from both cultures had higher intrinsic motivation and academic self-concept scores compared to other grade levels. In terms of extrinsic motivation, there is a steady decline in American students' scores as grade level increases. On the other hand, Turkish undergraduates' extrinsic scores decrease in the second year but increase in the third and fourth year of university education. Results were discussed by taking into consideration the social and cultural differences between two nations.

Keywords: comparative study, academic motivation, academic self-concept.

Murphy. (2009) was conducted involving a group of 290 medical and dental students to directly compare perceived stress levels encountered during their education. A modified questionnaire based on Garbee et.al.'s Dental Environmental Stress survey was provided to the students by either email or paper. The purpose of the investigation was to determine if the sources of stress reported by medical and dental students, both male and female, were due to common factors. A multivariate statistical analysis was also conducted to measure stress differences by year in school. Through factor analysis, the survey question responses were grouped into five causal categories: academic performance, faculty relations, patient and clinic responsibilities, personal life issues, and professional identity. The overall findings show that dental students had greater levels of stress than medical students in three of the five categories. The only category in which medical students demonstrated greater stress levels than dental students was in professional identity. Measures of comparative levels of stress between male and female students for either profession did not demonstrate any significant differences. Stress levels related to clinical work varied significantly between the type of professional student and his or her year in school.

Patil et.al. (2012) evaluated the comparative rural fitness between rural farmers and their urban sedentary counterpart in Gulbarga district. The study
included 30 apparently healthy male rural farmers and 30 urban sedentary subjects in the age group of 20 to 30 years belonging to Gulbarga district. Anthropometric measurements were recorded, Body Mass Index (BMI) was calculated, pre and post exercise Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Pulse Pressure (PP) and Mean Arterial Pressure (MAP), Heart Rate (HR), peak exercise HR, post exercise HR were recorded and percent Recovery Heart Rate (%RHR) in beats per minute (BPM) of both groups was calculated. Results: The BMI was significantly lower (p<0.05) in rural farmer group compared to urban sedentary group. We found a significant increase of pre SBP (p<0.05), pre MAP (p<0.05), post SBP (p<0.001), post DBP (p<0.05), post PP (p<0.05), and post MAP (p<0.001) in urban sedentary group compared to rural farmer group. Peak HR (p<0.001), 1 min Post HR (p<0.001) was significantly decreased in rural farmer group. But % RHR (p<0.001) and PFI Score (p<0.001) were found to be significantly increased in rural farmer group compared to urban sedentary group. We found a negative correlation between BMI and % recovery heart rate, BMI and PFI Score in rural farmer group compared to urban sedentary group.

Guedes et.al. (2012) identified the proportion of children and adolescents of the school population from Montes Claros, Minas Gerais, Brazil, who meet the health-related criteria determined by physical fitness components. The sample was composed of 2,849 subjects (1,457 girls and 1,392 boys), with age range between 6 and 18 years. The physical fitness components were assessed by a test battery of five items: back-saver sit-and-reach; curl-up; trunk-lift; push-up and endurance run (PACER), following cut off-points for gender and age suggested by the Fitnessgram. It was possible to observe with the obtained results that the proportion of schoolchildren that reached the minimum motor requirements established was not higher than 8%, and the global amount able to meet the health-related criteria was lower from 10 years of age in both genders. The data also show that great part of the studied youngsters demonstrate physical fitness components that could compromise a better health status, indicating the urgent need of implementing intervention programs.
addressed to the improvement of the practice of physical exercise in the school population.

**Sinku and Chavan. (2011)** were investigated to identify the physical fitness components of rural and urban students. 40 students, 20 rural and 20 urban from various colleges of Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra India were selected as a subjects for the study. Execution criteria were the presence of chronic medical condition such as asthma, heart disease or any other condition that would put the subject at risk when performing the rural fitness components. The data was collected by use of measurements of height & weight as well as by application of tests like, running, jumping, steeping, setups etc. The data was analysed with the help of statistical procedure in which arithmetic mean, standard deviation and t - test were employed. The mean ages of rural students were 21.03 (+ 3.11) years, heights were 171.33 (+ 5.22) cm. and the weights were 68.48 (+3.91) kg. On other hand the mean (+ S.D.) age of the urban students were 21.99 (+3.72) years, height 171.66(+ 8.29) cm. and weight 67.92 (+ 3.76). Significant difference in the agility (t=3.11, p<.05) was found between rural and urban students, urban students was found to be greater agility as compared to rural students while comparing speed ability ( t= 3.26, p<.05) significant difference was found between rural & urban students. Urban students incur significantly less speed ability as compare to rural students. Meanwhile, significant difference was found in endurance ability (t=5.96, p<.05) between rural and urban students. Rural students were found to have got more cardio vascular efficiency as compare to urban students. While comparing explosive strength between rural and urban students, significance difference was found (t=6.53, p<0.5). Rural students were Strongest as compared to their counterpart. Whilst no significant difference in the muscular strength was found between two groups students.

**Jourkesh et.al. (2011)** examined and compared the physical fitness level among normal weight and obese urban university students. The second aim
was to investigate the influence of exercise training on some physical fitness factors between these students. Thirty sedentary urban medical students from Medical Sciences University of Tehran assigned on two separate groups of normal weight (n=15, BMI=21.58±1.13) or obese (n=15, BMI=28.22 ±5.84). Anthropometric measurements included were: height, weight, age and Body Mass Index (BMI). Rural fitness tests (One mile run for determination of cardiovascular endurance, Bench and leg press for determination of upper and lower limb muscular strength, Sit-up and push-up for determination of abdomen and shoulder muscular endurance and sit and reach test for determination of flexibility. All physical fitness tests were assessed before and after exercise training program. Resting and training heart rate and blood pressure were assessed in pre and post-test. Significant differences were found between the means for the obese and normal weight groups for body physical fitness tests (p < .05). There were not significant differences between the means for the obese and normal weight groups for resting and training heart rate and blood pressure (p < .05). In this study, the obese participants had more fat mass compared to the normal weight participants. High BMI had an adverse effect on common everyday functional tasks in urban students. Compared to those that are normal weight, individuals with obesity had the greatest impairments in physical function and tended to less accurately depict rural function abilities.

Sunil. (2011) compared physical fitness components namely speed, strength, endurance, agility and flexibility between urban students belonging to rural and urban set-ups. The study was carried out on 150 urban students, 50 rural and 50 urban of Delhi University, Delhi. The data was collected by use of measurements of height and weight as well as by application of tests like jumping, stepping, running, flexibility test etc. The data was analysed and compared with the help of statistical procedures in which arithmetic mean, standard deviation (S.D.), standard error of mean (SEM), t-test were employed. Rural urban students were found to be superior in strength, endurance, speed and agility. Urban students on the other hand, were found to be heavier and superior in tasks like flexibility.
**Amusa and Goon. (2011)** presented the data on the health-related physical fitness of the Tshannda rural school children in grades 1 to 7 and to evaluate age and gender differences in physical fitness among the Tshannda children, of which information is not yet available. The stature, body mass and skin folds of the children was measured and the Euro fit test battery was used to assess the children's physical and performance fitness. Percentage body fats, fat mass and fat-free mass were calculated. There was progressive increase and improvement in the performance values from grade level one to seven. In the rural performance tests requiring moving the body, power and strength, the boys generally performed higher than the girls. Girls were superior to boys in the tests of flexibility. Body fat was higher in girls than in boys at all grades and increases with advancement in grades. The physical performance measures of our samples increase in grade levels and with the boys having higher values than girls as well as performing better in activities requiring physical exertion and expenditure of energy. In contrasts, the girls showed superiority in flexibility measures and accumulate more body fat than the boys. Physical fitness of these rural school children seems to be low, thus confirming the worldwide decline in fitness levels of children.

**Shriver et.al. (2011)** evaluated the level and relationship between rural activity and fitness in a sample of rural third graders. The second purpose of the study was to determine potential differences in rural activity and fitness level by weight status in this sample, 12 schools participating in a multidisciplinary research project were randomly selected for the study. Body mass index-for-age percentile, the modified Self-administered Rural Activity Checklist, and the FITNESSGRAM battery tests were utilized to determine children's weight status, rural activity, and fitness level, respectively. **RESULTS:** Thirty-eight percent of the 237 participating children (9.2 ± 0.4 years) were overweight or obese. Nearly 15% were extremely obese. Children spent 91.8 ± 83.8 and 32.2 ± 47.7 minutes in moderate- and vigorous-intensity activities. Obese children spent less time in moderate-intensity activity (p < .01) and combined moderate- and vigorous-intensity activity more than other
children (p < .05). Forty-three percent of all children failed to meet the fitness standard for muscular strength and 36% failed to meet it for flexibility. Rural children in this sample had higher rates of obesity compared to the national average; they had poor fitness and 30% failed to meet the minimum physical activity recommendations on the previous day. Future interventions should focus on increasing physical activity, especially of moderate-intensity, and improving physical fitness in order to reduce obesity and decrease the risk of future chronic diseases in this high-risk population.

Pelegrini et.al. (2011) examined the physical fitness of Brazilian schoolchildren, according to a health-referenced criteria assessment. This was a cross-sectional, school-based, epidemiological study of 7,507 schoolchildren (4,114 boys and 3,393 girls) aged 7 to 10 years. The following variables were measured: body weight, height, flexibility (sit-and-reach), muscle strength/resistance (1 minute modified abdominal) and cardiorespiratory fitness (9-minute walk/run). The criteria and classifications used for the motor tests were recommended by the Physical Best. The motor tests demonstrated low physical fitness, representing health risk in terms of flexibility (boys: 58.3%; girls: 51.2%, p<0.001), muscle strength/resistance (boys: 75.3%; girls: 73.8%, p<0.001) and cardiorespiratory fitness (boys: 80.8%; girls: 77.6%, p<0.001). The overall classification derived from all the three motor tests showed that very high proportion of the schoolchildren (~96%) did not meet the pre-established cut-offs for a satisfactory level of physical fitness. Effective intervention programs promoting changes in physical fitness standards are needed in order to contribute to the development of healthier levels of motor performance, especially based on public policy initiatives that provide opportunities for physical activity and sports in neighbourhoods, parks and condominiums.

Cheng et.al. (2011) explored whether or not differences in health-related physical fitness exist among people with different leisure lifestyles. The Physical Fitness Scales for Taiwan Citizens (Cheng & Liu, 2001) was utilized
to measure the health-related physical fitness of 241 college students. Factor analysis resulted in 4 dimensions; namely, dawn activity loving, sports loving, healthy diet, and vacation loving. Next, using cluster analysis, we identified 4 groups of college students, and they were dawn activity lovers, sports lovers, inactive healthy dieters, and vacation lovers. Finally, we explored the relationships among the 4 groups and their health-related physical fitness using one-way analysis of variance. The results indicate that college students who routinely engage in exercise tend to have physical fitness superior to those who do not exercise on a regular basis.

Guedes et al. (2011) investigated the association between socio-demographic and behavioural factors and health standards based on physical fitness component scores in a sample of Brazilian schoolchildren. Methods: A sample of 1457 girls and 1392 boys aged 6-18 years performed a test battery of five items: (a) sit-and-reach, (b) curl-up, (c) trunk-lift, (d) push-up, and (e) PACER. The cut-off scores for gender and age suggested by the Fitnessgram were adopted. Results: The findings showed that the sociodemographic and behavioural factors significantly associated with the ability of schoolchildren of meeting the health standards varied according to the fitness test. In the five tests used girls presented lower chance of meeting the health standards. Age and socioeconomic class were negatively associated with the performance in all physical tests. Schoolchildren ≤ 9 years or from families of lowest socioeconomic class presented approximately the double chance of meeting the health standards than those ≥ 15 years and from more privileged families, specifically in the push-up (OR=2.40; 95% CI 2.01-2.82) and PACER (OR=2.18; 95% CI 1.84-2.54).

Winnick and Short. (2005) brought about the development of the Brockport Physical Fitness Test (BPFT) - a criterion-referenced health-related test of physical fitness appropriate for use with youngsters with disabilities. The test recommends test items and health-related criterion-referenced standards for youngsters with an intellectual disability, spinal cord injuries,
cerebral palsy, blindness, congenital anomalies and amputations and recommends a process to develop tests appropriate for youngsters with other disabilities and health-related needs.

M. Herman et.al. (2011) examined sex differences in the association between youth body mass index (BMI) and adult HRQL. Subjects included 139 male and 142 female participants aged 7-18 in the 1981 Canada Fitness Survey, followed up in 2002-04. The associations of youth BMI to adult HRQL (SF-36) were examined with bivariate correlations, differences in means and multivariate linear regression analyses. Bivariate analyses revealed positive associations between youth overweight and mental aspects of adult HRQL in females, and weak negative associations with physical aspects, but no significant associations in males. All overweight male and female youth scored the maximum (100) on Role Emotional (RE). In females, compared to healthy weight youth, overweight youth scored 16.0, 13.4, 12.7, and 10.9 points higher on general health (GH), vitality (VT), mental health (MH), and the mental component score (MCS) in adulthood, respectively; a 1 unit increase in youth BMI led to 1.7, 1.5, and 1.4 point increases in adult VT, MH and MCS scores, respectively. Associations were attenuated with the removal of adult BMI from the models, but remained strong for MH and MCS.

Jourkesh et.al. (2011) compared physical fitness level among the students of ILU, Shabestar Branch. This research delivers the importance of physical fitness to health for all individuals have been well documented. Physical fitness is a required element for all the activities in our society. Health related physical fitness of an individual is mainly dependent on lifestyle related factors such as daily physical activity levels. It was believed that the low physical fitness level of an individual is associated with higher mortality rate. Physical fitness is also considered as the degree of ability to execute a physical task under various ambient conditions. The purpose of this study is to experiment, measure and evaluate the level of physical fitness among college students of Islamic Azad University (IAU), shabestar branch based on gender.
There were 450 students who have been involved in this physical fitness test study which were 250 male students (mean ± SD; Age: 22.5 ± 8.25 years, Height: 174.23 ± 5.2 cm, Weight: 68.45 ± 9.29 kg) and the other 200 are female students (mean ± SD; Age: 22.75 ± 6.2 years, Height: 159.75 ± 5.2 cm, Weight: 56.71 ± 8.84 kg). There were 6 activities in this test which were 12 minute run, sit-up, and vertical jump for explosive strength, 10 meter agility shuttle, flexibility and push up. All these tests were evaluated the level of fitness from aspect agility, speed, endurance of cardiovascular, power of leg and flexibility. Physical fitness performance was better in male students, except for sit and reach test, in which female students performed better.

Eather et.al. (2011) reported the rationale and methods for a school-based intervention designed to improve physical fitness and physical activity levels of Grades 5 and 6 primary school children. Methods/Design: Fit-4-Fun is an 8-week multi-component school-based health-related fitness education intervention and will be evaluated using a group randomized controlled trial. Primary schools from the Hunter Region in NSW, Australia, will be invited to participate in the program in 2011 with a target sample size of 128 primary schools children (age 10-13). The Fit-4-Fun program is theoretically grounded and will be implemented applying the Health Promoting Schools framework. Students will participate in weekly curriculum-based health and physical education lessons, daily break-time physical activities during recess and lunch, and will complete an 8-week (3 × per week) home activity program with their parents and/or family members. A battery of six health-related fitness assessments, four days of pedometer-assessed physical activity and a questionnaire, will be administered at baseline, immediate post-intervention (2-months) and at 6-months (from baseline) to determine intervention effects. Details of the methodological aspects of recruitment, inclusion criteria, randomization, intervention program, assessments, process evaluation and statistical analyses are described. Discussion: The Fit-4-Fun program is an innovative school-based intervention targeting fitness improvements in primary school children. The program will involve a range of evidence-based
behaviour change strategies to promote and support physical activity of adequate intensity, duration and type, needed to improve health-related fitness.

**Saygin and Ozturk. (2011)** revealed the effect of twelve week aerobic exercise programme on health related physical fitness components & blood lipids in obese girls. The aim of this study was to investigate the effects of 12 week aerobic exercise program on health related fitness components and blood lipids in obese girls. In this study, a total of 40 girls were recruited as exercise group \((n = 20)\) and control group \((n = 19)\). Participants joined sessions for 60 min per day, 3 days per week for 12-week. There were significant differences in weight, body mass index (BMI), flexibility, sit-ups, hand grip for both hands, VO2max, skin fold measurements (thigh, triceps, biceps, abdomen, suprailliac, sub scapula, chest, body fat percent, heart rate, high density lipoproteins (HDL), low density lipoproteins (LDL), total cholesterol, and triglyceride between pre-test and post test scores in the exercise group \((p<0.05)\). It was concluded that regular aerobic exercise may affect health related fitness components and blood lipids positively in girls. Furthermore, it may result in decreasing obesity in girls.

**Santos and Mota (2011)** conducted the study on Alpha health-related physical fitness test for children and adolescents, a new health-related fitness test battery for youth based upon the work developed by the ALPHA (Assessing Levels of Physical Activity) study. The ALPHA was a study funded by the European Union, aimed to provide a set of instruments for assessing levels of physical activity, its underlying factors (e.g. build environment, transport, and workplace), as well as, fitness in a comparable way within the European Union. The work presented in this issue by Ruiz and colleagues relates to the working package 6 of the ALPHA project "Assessing Health related Physical Fitness" aimed to provide a set of valid, reliable, feasible and safe field-based fitness tests for assessment of health-related physical fitness in children and adolescents to be use in public health monitoring in a comparable way within the European Union. At a population level, the regular screening
of physical activity and physical fitness (including body composition) levels should be considered a public health priority, as the lack of physical activity and/or physical fitness are implicated in the aetiology and prevalence of several non-communicable diseases, such as cardiovascular disease, diabetes and cancer and their risk factors (high blood pressure, raised blood sugar and overweight), affecting the general health population worldwide. Moreover, from a public health preventive point of view, schools should play a central role in the provision and promotion of physical activity and physical fitness in young people, along with other health behaviours, as children and adolescents spend a large amount of time in the school environment. While objective measures of fitness in the laboratory are very accurate and precise, they are also more expensive, require sophisticated equipment and qualified technicians and are time-consuming; therefore, their use in epidemiological studies and/or in the school setting are limited. Until now, several field based fitness test batteries were available to measure physical fitness in youth; however, most of them were developed for children and adolescents from the USA. Before the ALPHA study, the only set field-based fitness tests developed for European children and adolescents was the Euro fit battery. Taking in consideration the aims of the ALPHA study, the work performed by Ruiz and colleagues focused their attention on field-based test batteries and followed an excellent methodology by starting their work by reviewing the evidence on (i) the association between physical fitness and health in young people mainly focused on findings from cross-sectional studies; (ii) the predictive validity of health-related fitness; (iii) the criterion validity of field-based fitness tests and (iv) the reliability of field-based fitness tests in young people. In the second phase of their research, the authors’ team also carried out 11 methodological studies to determine criterion validity, and the reliability of several field-based fitness tests for young people. The third phase of their work included a study in the school setting to examine the reliability, feasibility and safety of the evidence-based selected tests. After these research steps the team lead by Ruiz concluded that cardiorespiratory fitness, muscular strength and body
composition could be considered as markers of health already at childhood and adolescence, as well as health indicators of future cardiovascular health. The 20m Shuttle Run Test can be considered both valid and reliable to assess cardiorespiratory fitness; the handgrip strength and the standing broad jump tests are valid and reliable to assess musculoskeletal fitness; and body mass index, skinfold thickness and waist circumference are valid and reliable measures to estimate body fat. The authors also refer that they did not find evidence for other tests assessing motor fitness or flexibility due to the lack of studies. Even though, the authors decided to include in the ALPHA health-related fitness test battery the 4 x 10 m motor fitness test, once this test has been associated with bone mass; however there is no evidence to conclude about its predictive and criterion validity. The authors suggest that these set of tests are feasible and safe to be used in the school setting and at population level. The excellent work performed by Ruiz and colleagues within the ALPHA study has pushed forward the scientific knowledge by improving our understanding about the health-related implications of a poor fitness in young people; and about the reliability, validity, feasibility and safety of several field-based physical fitness tests for children and adolescents. Their contribution for the scientific field of health-related physical fitness in young people was of great value and should be highlighted. With the work presented in this issue the authors have fully addressed their aims by providing a set of valid, reliable, feasible a safe field-based fitness tests for the assessment of health-related physical fitness in children and adolescents to be used in public health monitoring in a comparable way within the European Union.

Ujevic et.al. (2011) determined the levels of several health-related physical fitness components among Croatian elementary school girls from fifth to eighth grade. 868 eighth grade girls, students of elementary schools in Croatia. A total of 3,616 school girls were chosen to participate in the present study, as a representative sample of all parts of Croatia. The schools were selected from various geographical areas depending on their level of urbanization. All participants were healthy and participated regularly in two
obligatory PE classes per week. The data were collected from February until the end of April 2009. Prior to the participation in the study, a written informed consent was obtained from every participant’s parent and a permission to conduct the study from the school principals. This paper presents the results of a larger study with the aim of validating tests and measurements for assessing kin-anthropometric characteristics of school children in Croatia. Methods for evaluating health-related physical fitness may vary according to the structure of the study. The AAHPERD (AAHPERD, 1984) test battery designed for the assessment of health-related physical fitness in children was used as guidance in determining our test battery with slight modifications in consolidation with the Euro fit test battery (Adam et al., 1988). Body height, body weight and body mass index (BMI) were used as anthropometric measures. Five components of physical fitness were tested (four motor and one cardiovascular health-related fitness test). These included 20-meter dash (as a measure of movement speed), standing long jump (as a measure of explosive power), sit and reach (as a measure of lower back/upper thigh flexibility), dynamic sit-ups completed in 60 seconds (as a measure of abdominal strength and endurance) and distance run (as a measure of cardiorespiratory endurance). Standing height was measured to the nearest 0.5 cm with the Martin-type anthrop meter for the standing posture. Weight was measured to the nearest 0.1 kg using portable digital scales (Omron BF500 Body composition monitor). The measurements were made while the children were wearing light clothes and no shoes. BMI was calculated as weight in kilograms divided by the square of height in meters (BMI = kg/m²). The 20-meter dash was performed from the standing start position. The test measured the time elapsed to the nearest 0.1 second from the starting signal to crossing the finish line. Three trials were administrated alternating with the resting pause. The mean value was calculated and included in the analysis. This test measured the explosive power of the lower extremities, which indicates the ability of maximum movement speed. The standing long jump (SLJ), as a measurement of explosive power, was measured to the nearest cm as the distance from the standing start to the
point of landing heels. Three trials were administered and the mean value was included in the analysis. The sit and reach (SAR) measured the distance of the performed stretch to the nearest cm. Before the test, the shoes were removed and the subjects were instructed to slowly reach forward with their knees fully extended as far as possible with palms facing downward. This test represents flexibility in the lower back and upper thighs. Three trials were administrated and the mean value was taken in the analysis. The maximum number of sit-ups achieved in 60 seconds was recorded. The subjects were instructed to keep their arms across the chest while curling up to a sitting position until their elbows touched their thighs. This test gave us insight into abdominal strength and endurance. One trial was given. A distance run (600 meters) was measured as the time elapsed to the nearest second from the starting signal to crossing the finish line. This test presents an example of cardiorespiratory endurance. The time necessary to cover the proposed distance was recorded in minutes and seconds. One trial was administrated. A data analysis was conducted using the Statistical Package for Social Sciences (v18.0, SPSS Inc., Chicago, IL). The descriptive statistics were computed for all the experimental data and separately for each grade (mean, standard deviation, range, skewness and kurtosis). In addition, the Kolmogorov-Smirnov test was used for testing the normality of distribution before further analysis. The differences between the children’s physical fitness profiles from grade to grade were determined using analysis of variance ANOVA with Bonferroni correction. The statistical significance was estimated at the level of $p \leq 0.000625$. Overall, one way ANOVA showed that all of the health-related physical fitness variables showed statistical significance and higher results in older girls. Pair wise comparison analysis in body height, as well as in body weight, between all grades showed statistical differences ($p<0.000$). In BMI there was statistical significance between sixth and seventh grade ($p=0.04$), but no statistical significance between fifth and sixth grade ($p=0.211$) nor seventh and eighth grade ($p=0.252$). Ability of maximum movement speed, represented by the 20 meter dash, showed statistical difference between fifth and sixth ($p=0.000$), and sixth
and seventh grade \( (p=0.04) \) but no difference was found between seventh and eighth grade \( (p=1.000) \). In standing long jump differences were found between fifth and sixth, and sixth and seventh grade, respectively \( (p=0.000, p=0.006) \), but no difference between seventh and eighth grade \( (p=0.454) \). Sit and reach test showed no statistical significance only between sixth and seventh grade \( (p=1.000) \) as opposed to difference in fifth and sixth \( (p=0.000) \), and seventh and eighth grade \( (p=0.000) \). Statistical significance was obtained between all grades in maximum number of sit-ups \( (p<0.03) \). Distance run test showed significant differences between fifth and sixth grade \( (p=0.01) \) and seventh and eighth grade \( (p=0.000) \) but there was no difference between sixth and seventh grade \( (p=0.456) \). The results obtained in this study show that the performance on all of the physical fitness variables is generally higher in older girls despite recent study evidences of populations’ sedentary behaviour. In this study, school girls were grouped by grades, irrespective of their chronological age and biological development, so some misclassification for children and adolescents in relation to their biological development may occur. Therefore, it is of interest to examine the associations between health-related physical fitness components and biological age in young girls.

**Shang et.al. (2010)** investigated the association of weight status with physical fitness among Chinese children. A total of 6929 children aged 6–12 years were selected from 15 primary schools of 5 provincial capital cities in eastern China. The height and fasting body weight were measured. The age-, sex-specific criteria was used to define underweight, overweight and obesity. Physical fitness parameters including standing broad jump, 50m sprint, and 50m*8 shuttle run were tested. The prevalence of underweight, overweight, and obesity was 3.1%, 14.9%, and 7.8%, respectively. Boys performed better than girls, and the older children performed better than their younger counterparts for all fitness tests. No significant difference in all three physical fitness tests were found between children with underweight and with normal weight, and they both performed better than their counterparts with overweight and obese in all three physical fitness tests. The likelihood of achieving good
performance was much lower among overweight and obese children in comparison with their counterparts with normal weight (OR=0.13–0.54).

Hodgkin et.al. (2010) raised concerns about childhood obesity and its long-term impact on the health of children. The objective of this study was to investigate rural–urban differences in body composition, energy intake, and rural activity and screen time in New Zealand children. This study reports on data collected in a large national cross-sectional population survey of 5-15 year-old New Zealanders (the 2002 National Children’s Nutrition Survey, CNS02). Schools were randomly selected to participate, as were pupils from the selected schools. Measurements of body composition were taken at school. Energy intake, rural activity and screen time information were taken from interviews and questionnaires undertaken by the child and parent/guardian. Means and standard deviations were calculated in the Statistical Analysis System (SAS Inst; Cary, NC, USA). Differences between groups were analysed using Proc. Mixed after adjusting for socio-economic status and ethnicity. Data indicating differences between groups were presented as least square means ± 95% confidence limits (CL); unless otherwise stated, and the _ was set at $p < 0.05$. The result of this study is Rural children had a significantly lower BMI, smaller waist circumferences and thinner skinfold measurements than urban children. The differences in skinfold thicknesses remained after controlling for ethnicity and socioeconomic status. Furthermore, urban boys were 1.3 times more likely to be overweight or obese than rural boys (95% confidence limits 1.1-1.6, $p <0.01$) and urban girls were 1.4 times more likely to be overweight or obese than rural girls (95% CL 1.2-1.7, $p <0.01$). There was no significant difference in the energy intake per day of rural and urban children. Similarly, there was no significant difference in the frequency of bouts of rural activity undertaken by rural and urban children.

Shahana et.al. (2010) studied the effect of aerobic exercise programme on health related physical fitness components of middle aged women. The purpose of the study was to determine the effect of a 12-week aerobic exercise
programme on health-related physical fitness components, which are cardiorespiratory endurance, flexibility, abdominal strength endurance and body fat in middle-aged women. In this research total of 60 middle-aged women from Karyavattom Panchayath of Trivandrum district in Kerala state between the age group of 35 and 45 years were selected as subjects for the study. The subjects were tested to collect the data on selected variables. The cardiorespiratory endurance, flexibility, abdominal strength endurance and body fat percentage were selected variables. Further, 30 subjects were randomly assigned as experimental group and 30 as control group. The experimental group underwent aerobic exercise training thrice a week for 12 weeks. The control group did not attend any training programme. The post-tests were conducted on both groups to collect the data on the variables of the study. The data pertaining to health-related physical fitness components were analysed by paired-$t$ test to determine the difference between initial and final mean for experimental and control groups. Significant difference seen at the 0.05 level with 29 degree of freedom is 2.045 and at 0.01 level with 29 degree of freedom is 2.756 in experimental group following 12 weeks of aerobic training programme for cardiorespiratory endurance, flexibility, muscular strength endurance and skin fold thickness (body fat %). In the case of control group no significant changes were seen in any of the selected variables.

Hakkinen et.al. (2010) investigated the impact of measured cardiovascular and musculoskeletal physical fitness level on HRQoL in Finnish young men. Methods: In a cross-sectional study, we collected data regarding the physical fitness index, including aerobic endurance and muscle fitness, leisure-time physical activity (LTPA), body composition, health, and HRQoL (RAND 36) for 727 men [mean (SD) age 25 (5) years]. Associations between HRQoL and the explanatory parameters were analyzed using the logistic regression analysis model. Results: Of the 727 participants who took part in the study, 45% were in the poor category of the physical fitness, while 37% and 18% were in the satisfactory and good fitness categories, respectively. A higher frequency of LTPA was associated with higher fitness
Better HRQoL in terms of general health, physical functioning, mental health, and vitality were associated with better physical fitness. When the HRQoL of the study participants were compared with that of the age- and gender-weighted Finnish general population, both the good and satisfactory fitness groups had higher HRQoL in all areas other than bodily pain. In a regression analysis, higher LTPA was associated with three dimensions of HRQoL, higher physical fitness with two, and lower number of morbidities with all dimensions, while the effect of age was contradictory.

McMillan and Erdmann. (2010) tracked health-related physical fitness measurements in children, including sum of triceps and medial calf skinfolds, timed 1-mile run/walk, 1-min bent-knee sit-up, pull-up, and sit-and-reach values. Results are from 409 boys and 409 girls tested in kindergarten and fifth grade, also retaining their first, second, third and fourth grade data. In separate gender analyses, Spearman’s rho correlations were significant (p<0.001) for all grade level pair combinations for each variable. Five-year tracking of adiposity and all health-related physical fitness measurements for boys and girls was generally moderate from early childhood to the upper elementary ages.

Monroe et.al. (2010) examined the relation of college students' self-perceived and measured physical fitness. Students (30 men, 30 women; M age = 20.1 yr., SD = 1.4) completed the Physical Self-description Questionnaire and four fitness tests: air displacement plethysmography, submaximal treadmill test, curl-up test, and sit-and-reach test. Significant correlations were obtained for self-perceived physical fitness with measured body composition, cardiorespiratory endurance, muscular endurance, and flexibility (r = .33 - .62). Significant correlations were also found between self-perceived overall fitness and actual body composition, cardiorespiratory endurance, and muscular endurance (|r| = .26 - .55). These findings suggest that college students can gauge their own fitness in terms of four distinct health-related components with some accuracy.
Urdiales et al. (2010) were attempted to reveals Secular Trends In Health-Related Physical Fitness in Spanish Adolescents. They analysed the secular trends in health-related physical fitness in Spanish adolescents between 2001–2002 and 2006–2007. Two representative population studies were conducted 5 years apart in adolescents (12.5–17.5 years) from Zaragoza (Spain) that participated in the AVENA study in 2001–2002 and in the HELENA-CSS study in 2006–2007. Both studies used the same tests to assess physical fitness: the handgrip strength, bent arm hang, standing broad jump, 4×10m shuttle run and 20m shuttle run tests. Performance in 4×10m shuttle run and 20m shuttle run tests were higher in 2006–2007 (Cohen’s d ranging from 0.2 to 0.4, p < 0.05), whereas performance in handgrip strength and standing broad jump tests were lower in 2006–2007 (Cohen’s d ranging from 0.3 to 1.1, p < 0.001). Adjustment for age, pubertal status, and fat mass, fat free mass and parental education did not alter the results. The odds ratio (OR) of meeting the FITNESSGRAM standards for healthy cardiorespiratory fitness was higher in 2006–2007 in both boys (OR, 95% CI: 2.123, 1.157–3.908) and girls (OR, 95% CI: 2.420, 1.377–4.255). The results indicate that levels of both speed/agility and cardiorespiratory fitness were higher in 2006–2007 than in 2001–2002, whereas muscular strength components were lower in 2006–2007.

Banitalebi et al. (2010) revealed the effects of exercise training on health-related physical fitness factors and blood lipids profile of former addicted persons. In this research Dysfunctional eating patterns and excessive weight gains have been observed during recovery from drug and alcohol addictions. The purpose of this study was to determine the effect of exercise training on health-related physical fitness factors and blood lipids profile of former addicted persons. Thirty seven males who were 23-49 years old, and had one-year quitting history were selected and randomized (exercise group, n= 18 and control, n= 19). Thirty eight individuals completed the entire study; 16 persons were in exercise group and 15 persons were in control group. Exercise training was consisted primarily of some game-based aerobic exercise. Exercise training duration progressed from 20 minutes at the baseline
to 45 minutes at the end of weeks 12th, and intensity of exercise progressed from 50% of heart rate reserve of baseline to 70% at 12 weeks. Weight, BMI and WHR were measured. Muscle endurance, flexibility and VO₂ peak were measured using by Pull Up, Sit and Reach Test, & One Mile Rockport Walk Test, respectively. Body composition was assessed using the sum of three skin-fold measurement specific for males (chest, abdomen, and tight). Total Cholesterol (TC), High-Density Lipoprotein Cholesterol (HDL-C), Low-Density Lipoprotein Cholesterol (LDL-C) and Triglyceride (TG) were measured enzymatically using diagnostic pars kits. All variables were measured at baseline. Data analysed: By using ANCOVA analysis. There were no significant differences in weight (p=0.208), MBI (p=0.2631), CT (p=0.428), HDL (0.833), LDL (0.396), VLDL (p=0.169), TG (p=0.283), VO₂ peak (p=0.884), flexibility (p=0.923) and pull-up (p=0.44) after 12 weeks exercise training between two groups, but there was significant difference in WHR (p=0.044). It appears that, exercise training can prevent weight gain after quitting drugs and substances.

Aguero et.al. (2010) studied that, Physical fitness is related to health at all ages. Information about physical fitness in the Down Syndrome (DS) population, however, is scarce, especially when consider children and adolescents. A review of the current data available on this topic would be both timely and important as it would serve as a starting point to stimulate new research perspectives. The data reviewed from the literature showed a general trend toward lower values of physical fitness parameters and worse body composition variables in children and adolescents with DS compared with the population without Intellectual Disability (ID) or even with the population with ID without DS. Notably, children and adolescents with DS have been described as less active or overprotected; however, these factors may not be the cause of their poor physical fitness. Many of the training programs carried out in children and adolescents with DS did not yield the desired responses, and the reasons are still unknown. The purpose of this review is to summarize the current available literature on health-related physical fitness in children and
adolescents with DS, and the effect of training on these variables. From the literature available, it is clear that more data on this population are necessary.

**Ortega et al. (2010)** established the relationship between the compliance with the governmental physical activity guidelines (at least a minimum of one hour of moderate to vigorous physical activity, MVPA, five times a week), health-related physical fitness and different health related lifestyle variables in a representative sample of Spanish children. Subjects were a representative group of scholars from five schools randomly selected in Extremadura, a mainly rural region with a very low population density. Statistical analysis comprises a t-test to calculate physical fitness differences between groups, according to the compliance with the mentioned physical activity guidelines. A multinomial logistic regression coefficient is established to determine the differences between the better physical fitness status group percentile 75) and the poorer physical fitness status group percentile 25) for each fitness test and gender, body mass index, physical activity, Mediterranean diet index and population size. Main findings show that the compliance with physical activity guidelines result in a better handgrip strength in left hand (p < 0.05), leg strength (p < 0.000), speed-agility run (p < 0.000) and 20 m endurance shuttle run (p < 0.000). Being a girl, being overweight and living in an urban setting are associated with a lower physical fitness percentile 25), whereas there is no relationship between diet quality and subjects’ performance in all physical fitness test evaluated.

**Mak et al. (2010)** investigated the relation between health-related physical fitness and weight status in Hong Kong adolescents. 3,204 students aged 12-18 years participated in the Hong Kong Student Obesity Surveillance (HKSOS) project in 2006-2007. Anthropometric measures (height, weight) and health-related fitness (push-up, sit-up, sit-and-reach, 9-minute run) were assessed. Body mass index (BMI) was computed to classify participants into normal weight, underweight (Grade I, II/III), overweight, and obese groups. The associations of health-related physical fitness with BMI and weight status
were examined by partial correlation coefficients and analysis of covariance, respectively. Results: More boys than girls were overweight or obese (18.0% vs 8.7%), but more girls than boys were underweight (22.3% vs 16.7%). Boys performed significantly (P < 0.001) better in sit-up (38.8 vs 31.6 times/min) and 9-minute run (1632.1 vs 1353.2 m), but poorer in sit-and-reach (27.4 vs 32.2 cm) than girls. All four physical fitness tests were significantly positively correlated with each other in both sexes, and BMI was only weakly correlated with sit up and sit-and-reach tests in boys. Decreasing performance (P for trend < 0.05) was observed from normal weight to overweight and obese for push-up, sit-up, and 9-minute run in both sexes. From normal weight to Grade I and Grade II/III underweight, decreasing performance (P for trend < 0.05) for sit-up and sit-and-reach in both sexes and for push-up in boys was observed.

Wilkin et.al. (2010) assessed the functional fitness of a convenient sample of older adults (>70 years), to examine correlations between functional fitness and several other health-related variables and to compare with criterion performance data as established by Rikli and Jones (2001). One hundred and seven community-dwelling older adults with an average age of 78.36 ± 5.60 years performed the Senior Fitness Test (SFT) and responded to several health-related questionnaires. The SFT scores were similar to the scores in the low-active group data published by Rikli and Jones (1999b). There was a strong correlation between the 30-second arm curl and the 2-minute step-in-place (r = .54, p < .01). More than one-half of the participants performed in the normal range or above normal range, according to the criterion performance data. This demonstrates a high level of functional fitness.

Ringold et.al. (2009) compared child self-report and parent/proxy report of Health-Related Quality of Life (HRQOL), disability, and fatigue in children with active poly articular Juvenile Idiopathic Arthritis (JIA) to that of children with inactive poly articular JIA and to previous data from healthy controls. Cross-sectional survey of children with poly articular JIA diagnosed and treated in between 2000 to 2006 & their parent/proxy. The Childhood Health
Assessment Questionnaire, Pediatric Quality of Life Inventory (PedsQL) Generic Core Scales, PedsQL Rheumatology Module, and PedsQL Multidimensional Fatigue Scale were administered. Disease activity data were collected from the physician clinic notes. Comparisons were performed with t tests. Correlations between patient and parent/proxy reports were measured with Pearson correlation coefficients. The result of this study was, sixty children and/or their parents/proxies participated (79% response rate). Disease activity status was available for 52, and 32 met criteria for inactive disease (62%). Participants reported lower scores on the PedsQL Generic Core Scales (range 2.54-9.13 points lower) and the PedsQL Rheumatology Module (range 2.46-6.96 points lower) than those with inactive disease. Participants also reported lower scores on the PedsQL Multidimensional Fatigue Scale than did healthy controls, regardless of disease activity status (range 0.06-9.2 points lower).

Chen et al. (2009) explored the effect of yoga exercise on the health-related physical fitness of school-age children with asthma. The study employed a quasi-experimental research design in which 31 voluntary children (exercise group 16; control group 15) aged 7 to 12 years were purposively sampled from one public elementary school in Taipei County. The yoga exercise program was practiced by the exercise group three times per week for a consecutive 7 week period. Each 60-minute yoga session included 10 minutes of warm-up and breathing exercises, 40 minutes of yoga postures, and 10 minutes of cool down exercises. Fitness scores were assessed at pre-exercise (baseline) and at the seventh and ninth week after intervention completion. A total of 30 subjects (exercise group 16; control group 14) completed follow-up. Results included: 1. Compared with children in the general population, the study subjects (n = 30) all fell below the 50th percentile in all five physical fitness items of interest. There was no significant difference in scores between the two groups at baseline (i.e., pre-exercise) for all five fitness items. 2. Research found a positive association between exercise habit after school and muscular strength and endurance among asthmatic children. 3.
Compared to the control group, the exercise group showed favourable outcomes in terms of flexibility and muscular endurance. Such favourable outcomes remained evident even after adjusting for age, duration of disease and steroid use, values for which were unequally distributed between the two groups at baseline. There was a tendency for all item-specific fitness scores to increase over time in the exercise group. The GEE analysis showed that yoga exercise indeed improved BMI, flexibility, and muscular endurance. After 2 weeks of self-practice at home, yoga exercise continued to improve BMI, flexibility, muscular strength, and cardiopulmonary fitness.

Yoon et al. (2009) developed a novel exercise "Square-Stepping Exercise" (SSE) to prevent dementia and falls for older adults, and have reported that the regular SSE improved lower-extremity functional fitness, lack of which constitutes a risk factor for falls. However, little is known of the association between regular SSE and physical fitness in middle-aged or younger populations. The objective of this study was to investigate whether regular SSE could affect health-related physical fitness in middle-aged Japanese women. Subjects were 31 women, aged 55-64 year (average, 59.6 ± 5.0 year), who enrolled in a 60-min SSE class for health promotion once a week for 3 months (10 sessions in total). Each session consisted of 15-min warm-up, 30-min SSE, 15-min cool-down. The SSE was performed on a thin mat partitioned into 40 squares (25 cm each) arranged in 4 rows. We prepared over 100 stepping patterns in total, which were categorized by level of complexity. Subjects were required to memorize step patterns demonstrated by an instructor before each stepping and they enjoyed the challenge of more complicated patterns. Test items of health-related physical fitness and physical function consisted of grip strength, chair sit-to-stand, one-leg balance, simple and choice reaction times, functional reach, sit and reach, timed up-and-go, tandem walk, standing up from a lying position, and step test in 10 s. The items were measured before and after the intervention period. Results: All items displayed significant improvements after the class with the exception of sit and reach. In addition, significant decrease were observed in waist circumference
(pre 85.0 ± 9.6 cm, post 83.0 ± 10.0 cm, p < .001), systolic blood pressure (pre 129 ± 22 mmHg, post 122 ± 15 mmHg, p = .029), and diastolic blood pressure (pre 79 ± 11 mmHg, post 76 ± 9 mmHg, p = .036). The average of the number of steps, exercise-induced energy expenditure, heart rate (HR), and %HR reserve during the class were 2534 ± 635 step/session, 65.5 ± 15.4 kcal/session, 120.5 ± 15.4 BMP, and 51.3 ± 17.9%, respectively. Change in waist circumference was significantly correlated with the total of steps in 10 sessions (r = -.427, p = .018) and average number of steps per a class (r = -.548, p = .002). Change in weight was significantly correlated with the total of exercise-induced energy expenditure (r=-.378, p = .036).

**Chan et.al. (2009)** examined the daily intake of bone health-related nutrients and to explore the association between diet compositions and estimated Net Endogenous Acid Production (estimated NEAP) in Hong Kong Chinese adolescents. In total, 171 boys and 180 girls aged 10-12 years of Chinese origin from nine primary schools from the Hong Kong Adolescent Bone Health Cohort Study. The study design used food frequency questionnaire. Mean daily intakes of foods and selected nutrients were estimated. Mean percentage of nutrient intake contributed by different food groups was presented. Frassetto’s method was used to calculate the estimated NEAP from the diet's protein to potassium ratio. There was no significant difference in the energy-adjusted intakes of most nutrients between boys and girls, except for intakes of vitamins C and D. Mean protein, sodium and potassium intakes were higher than the Chinese Dietary Reference Intake (DRI), whereas mean intakes of magnesium, calcium and vitamin D were lower than the DRI. Boys had significantly higher estimated NEAP than girls (P=0.0051). Estimated NEAP was significantly positively correlated with meat intake and negatively associated with the consumption of fruits, vegetables, legumes, beverages and dairy products. The results highlight the importance of considering whole diet quality when interpreting the effects of single nutrient or diet's net acid load on bone. The effect on high protein intake and low fruit
and vegetable intake on the long-term bone health of Hong Kong Chinese adolescents warrants attention.

Keating et al. (2009) searched for to review and analyse research on student Health-Related Fitness (HRF) knowledge mastery in K–16 programs by examining studies published in the literature. Two major results emerging from the work are misconceptions about fitness and the lack of an adequate amount of HRF knowledge among students at all educational levels (i.e., elementary, secondary, and college). These results were essentially the same as those found more than 20 years ago, indicating a persistent deficiency in fitness education. In addition, little is understood as to how HRF knowledge contributes to the establishment of lifetime physical activity patterns. Student HRF knowledge determinants as well as effective instructional strategies also need thorough study. Based on these findings, implications for improving student HRF knowledge through physical education are discussed, and recommendations for future research are included.

Hands et al. (2008) attempted to determine the relationship among physical activity, motor competence and health-related fitness in 14-year-old adolescents. In this study, motor competence (measured by the McCarron Assessment of Neuromuscular Development), pedometer-determined physical activity and physical fitness (aerobic fitness, muscle strength, muscle endurance, flexibility and body composition) were examined in a cohort of 1585 adolescents (771 girls, 814 boys) of mean age 14.06 years. In this research significant gender differences were observed for all measures except motor competence. Apart from hip and shoulder flexibility, males outperformed females. For both males and females, motor competence was associated with all fitness measures, physical activity was associated only with aerobic fitness and aerobic fitness was associated with physical activity, motor competence, BMI and chest pass. Among males, aerobic fitness was also associated with all other fitness tests. The correlations were, in general,
moderate to weak. The results challenge the current focus on physical activity rather than physical fitness as the preferred intervention.

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**Ortega and Artero. (2008)** tried to check Reliability Of Health-Related Physical Fitness Tests in European Adolescents. The main objectives of the study was to examine the reliability of a set of health-related physical fitness tests used in the European Union-funded Healthy Lifestyle in Europe by Nutrition in Adolescence (HELENA) Study on lifestyle and nutrition among adolescents. The design of the study was a set of physical fitness tests was performed twice in a study sample, 2 weeks apart, by the same researchers. For this research Participants were total number of 123 adolescents (69 males and 54 females, aged 13.6±0.8 years) from 10 European cities participated. In this research flexibility, muscular fitness, speed/agility and aerobic capacity were tested using the back-saver sit and reach, handgrip, standing broad jump, Bosco jumps (squat jump, counter movement jump and Abalakov jump), bent arm hang, 4_10m shuttle run, and 20-m shuttle run tests. The ANOVA analysis showed that neither systematic bias nor sex differences were found for any of
the studied tests, except for the back-saver sit and reach test, in which a borderline significant sex difference was observed (P=0.044). The Bland–Altman plots graphically showed the reliability patterns, in terms of systematic errors (bias) and random error (95% limits of agreement), of the physical fitness tests studied. The observed systematic error for all the fitness assessment tests was nearly 0.

Buffart et.al. (2008) tried to evaluate components of health-related physical fitness in adolescents and young adults with Myelo Meningo Cele (MMC) and to study relations between aerobic capacity & other health-related physical fitness components. This cross-sectional study included 50 adolescents and young adults with MMC, aged 16-30 years (25 males). Aerobic capacity was quantified by measuring peak oxygen uptake (peakVO2) during a maximal exercise test on a cycle or arm ergometer depending on the main mode of ambulation. Muscle strength of upper and lower extremity muscles was assessed using a hand-held dynamometer. Regarding flexibility, we assessed mobility of hip, knee and ankle joints. Body composition was assessed by measuring thickness of four skin-folds. Relations were studied using linear regression analyses. Average peakVO2 was 1.480.52 l/min, 61% of the participants had subnormal muscle strength, 61% had mobility restrictions in at least one joint and average sum of four skin-folds was 74.838.8 mm. PeakVO2 was significantly related to gender, ambulatory status and muscle strength, explaining 55% of its variance. Adolescents and young adults with MMC have poor health-related physical fitness. Gender and ambulatory status are important determinants of peakVO2. In addition, we found a small, but significant relationship between peakVO2 and muscle strength.

Lars Sorensen et. al. (2008) examined the relationship between perceived work ability and Health-Related Quality of Life (HRQoL), and to investigate their associations with age, physical activity and physical fitness in middle-aged men working in blue-collar occupations. The study population consisted of 196 middle-aged (aged 40-60 years) men (construction and
industrial work) attending occupationally orientated early medical rehabilitation. They were mostly healthy having only symptoms of musculoskeletal or psychological strain. Perceived work ability was assessed with the Work Ability Index (WAI) and HRQoL with the Rand, 36-item health survey (Rand-36). Information on physical activity was obtained with a structured questionnaire. Cardiorespiratory fitness was estimated with a submaximal exercise test on a cycle-ergometer. The WAI was significantly (p<0.001) associated with the total score of Rand-36, and with all its domains. Age, physical activity and cardiorespiratory fitness were neither associated with the WAI, nor did physical activity predict any of the dimensions of Rand-36. Cardiorespiratory fitness was associated with the physical functioning dimension of the Rand-36 whilst age was positively associated with the dimensions of the energy, emotional wellbeing and social functioning of the Rand-36. The present study on middle-aged men showed a close relationship between perceived work ability and the HRQoL. It is suggested that the promotion of work ability may have beneficial effects on quality of life.

Lei Zhang et. al. (2008) investigated the relationship between Body Mass Index (BMI) and Health-Related Quality of Life (HRQOL) indicated by baseline health status in elementary school children. Data were obtained via parents whose children enrolled in an elementary school, kindergarten to fourth grade, in southern Mississippi in spring 2004. Parents completed the SF-10 for Children, a brief 10-item questionnaire designed to measure children's HRQOL on a voluntary basis. A total of 279 parents completed the questionnaires for their children. On average, physical and psychosocial summary scores, major indicators for HRQOL, were significantly higher among the elementary school children in our study relative to those from U.S. children overall (p < 0.0001 and p = 0.0007, respectively). Males tended to have better physical functioning than their female classmates, whereas females had better psychosocial health. Overall, except for third graders, the physical summary scores increased as grade level increased. The means for psychosocial score fluctuated without a clear pattern over the five grade levels. High level of BMI was significantly
associated with children's physical summary scores below 50, a norm used for U.S. children \((p = 0.003)\). Gender and grade were not significant predictors of children's physical and psychosocial scores. Discussion: This study can be used as baseline information to track changes over time, in BMI and health status among the elementary school children. In addition, this study can be used to investigate relationships between BMI, health status, intellectual ability, and performance in school.

Marita Sodergren et.al. (2008) pointed at (1) to identify the most inactive individuals in the population by assessing two dimensions of physical activity, (2) to investigate the correlation between exercise and total physical activity and (3) to investigate the association between exercise, total physical activity and good self-rated health. A simple random sample of the Swedish population aged 25–64 years was interviewed about their living conditions, health and lifestyle in a survey performed by Statistics Sweden. In total 1876 women and 1880 men completed the survey during 1999 (response rate 76.6%) when two different questions about physical activity assessed exercise and total physical activity in all domains (e.g. transportation, exercise, and at work). Logistic regression models were used to estimate odd ratios. The most inactive individuals (no exercise and total physical activity \(\leq 2\) hours per week) constituted 4.3% of the sample. The correlation between exercise and total physical activity was low (gamma = 0.4, \(p = 0.02\)). There were significant associations between higher levels of exercise, total physical activity and good self-rated health after adjustment for age, gender, country of birth, education, employment, marital status, housing tenure, smoking and BMI. Both exercise and total physical activity was independently associated with good self-rated health. It seems to be advantageous to use more than one question in population based surveys in order to evaluate several dimensions of physical activity and identify the most inactive individuals.

Husu et.al. (2008) investigated whether PA modifies the predictive value of Health-Related Fitness (HRF) tests on difficulty in walking 2 km (WD). PA
was assessed by self-reported questionnaires in 1990 and 1996. Subjects age 55 to 69 years and free of self-reported WD participated in assessment of HRF in 1996. Occurrence of WD was assessed by questionnaire in 2002 (n = 537). There were no statistically significant interactions between PA and HRF tests; thus, PA and HRF were both independent predictors of WD. Regardless of the PA level, the subjects in the poorest performing third in each HRF test had higher risk of WD than the subjects in the best performing third.

**Castelli and Williams. (2007)** examined what teachers know about health-related fitness (HRF) and how confident they are in their knowledge. Seventy-three middle school physical education teachers completed a 3-part cognitive HRF test and a self-efficacy questionnaire that required responses to statements about how confident they were in passing a HRF knowledge test. Results indicated that teachers were very confident in their knowledge of HRF; however, their actual HRF test scores did not meet the standard of achievement expected of a ninth-grade student as assessed by the South Carolina Physical Education Assessment Program. Further investigation of the influence of teacher characteristics related to HRF knowledge revealed that age and years of teaching experience significantly related to self-efficacy but not to HRF knowledge. This study implies that targeted teacher development is a necessary part of attaining and maintaining HRF knowledge required to teach to state and national standards.

**Ortega et.al. (2007)** attempted to summarize the latest developments with regard to physical fitness and several health outcomes in young people. The literature reviewed suggests that (1) cardiorespiratory fitness levels are associated with total and abdominal adiposity; (2) both cardiorespiratory and muscular fitness are shown to be associated with established and emerging cardiovascular disease risk factors; (3) improvements in muscular fitness and speed/agility, rather than cardiorespiratory fitness, seem to have a positive effect on skeletal health; (4) both cardiorespiratory and muscular fitness enhancements are recommended in paediatric cancer patients/survivors in
order to attenuate fatigue and improve their quality of life; and (5) improvements in cardiorespiratory fitness have positive effects on depression, anxiety, mood status and self-esteem, and seem also to be associated with a higher academic performance.

**Tran et al. (2007)** studied to determine the effects of hatha yoga practice on the health-related aspects of physical fitness, including muscular strength and endurance, flexibility, cardiorespiratory fitness, body composition, and pulmonary function. Subjects were required to attend a minimum of two yoga classes per week for a total of 8 weeks. Each yoga session consisted of 10 minutes of pranayamas (breath-control exercises), 15 minutes of dynamic warm-up exercises, 50 minutes of asanas (yoga postures), and 10 minutes of supine relaxation in savasana (corpse pose). The subjects were evaluated before and after the 8-week training program. Isokinetic muscular strength for elbow extension, elbow flexion, and knee extension increased by 31%, 19%, and 28% (p<0.05), respectively, whereas isometric muscular endurance for knee flexion increased 57% (p<0.01). Ankle flexibility, shoulder elevation, trunk extension, and trunk flexion increased by 13% (p<0.01), 155% (p<0.001), 188% (p<0.001), and 14% (p<0.05), respectively. Absolute and relative maximal oxygen uptake increased by 7% and 6%, respectively (p<0.01). These findings indicate that regular hatha yoga practice can elicit improvements in the health-related aspects of physical fitness.

**Verstraete et al. (2007)** targeted to evaluate the effectiveness of a 2-year health-related physical education intervention in a pre-test – post-test design. Sixteen elementary schools (764 pupils, mean age: 11.2 ± 0.7) participated in the study. Schools were randomly assigned to the intervention condition (n = 8) and the control condition (n = 8). Making use of direct observation data gathered according to SOFIT (System for Observing Fitness Instruction Time), the moderate-to-vigorous physical activity engagement during physical education classes was significantly higher in the intervention condition than in the control condition. Children's moderate-to-vigorous physical activity
engagement during physical education lessons increased with 14% in the intervention condition (from 42 to 56%). No significant effects were found on the accelerometer data. The health-related physical education intervention was found to be promising in promoting physical activity during physical education classes.

Warburton *et al.* (2006) assessed the current literature and to provide further insight into the role physical inactivity plays in the development of chronic disease and premature death. The researchers confirm that there is irrefutable evidence of the effectiveness of regular physical activity in the primary and secondary prevention of several chronic diseases (e.g., cardiovascular disease, diabetes, cancer, hypertension, obesity, depression and osteoporosis) and premature death. They also reveal that the current Health Canada physical activity guidelines are sufficient to elicit health benefits, especially in previously sedentary people. There appears to be a linear relation between physical activity and health status, such that a further increase in physical activity and fitness will lead to additional improvements in health status. Physical inactivity is a modifiable risk factor for cardiovascular disease and a widening variety of other chronic diseases, including diabetes mellitus, cancer (colon and breast), obesity, hypertension, bone and joint diseases (osteoporosis and osteoarthritis), and depression. The prevalence of physical inactivity (among 51% of adult Canadians) is higher than that of all other modifiable risk factors. In this article researchers review the current evidence relating to physical activity in the primary and secondary prevention of premature death from any cause, cardiovascular disease, diabetes, some cancers and osteoporosis. Investigators also discuss the evidence relating to physical fitness and musculoskeletal fitness and briefly describe the independent effects of frequency and intensity of physical activity. Activity guidelines promoted by Health Canada appear to be sufficient to reduce health risk. People who engage in exercise at levels above those recommended in the guidelines are likely to gain further health benefits. Health promotion programs
should target people of all ages, since the risk of chronic disease starts in childhood and increases with age.

**Thomas Adams et.al. (2006)** determined the immediate and long-term effectiveness of a university level Conceptually Based Health-Related (CBHR) fitness course on Health-Related Fitness (HRF) knowledge. Two hundred and seventy-seven students served as subjects. Subjects were grouped according to the following criteria. Group 1 represented students that had never taken and/or were not currently enrolled in the required CBHR course. Group 2 consisted of students currently completing the course. Groups 3 through 6 were grouped according to the number of weeks or years that had passed since they completed the required course. Group 3 represented students currently enrolled in school between 1 and 52 weeks post course completion. Similarly, Groups 4 and 5 represented students currently enrolled either 53-104 or 105-156 weeks post course completion, respectively. Group 6 represented students currently enrolled and who completed the concepts course 157 or more weeks prior to their participation in the study. An 80-item, multiple-choice test was used to determine HRF knowledge. One way ANOVA was used to determine significant differences \( F (5, 276) = 49.77, p = .000 \) between groups in HRF knowledge. A least significant difference post hoc analysis test determined mean differences occurred between Group 1 and all other groups and Group 2 and all other groups. No mean differences between Groups 3 through 6 were identified. Results of this study suggest students develop an above average level of HRF knowledge immediately following completion of a university level CBHR fitness course. Additionally, it was concluded students retain and present, for a minimum of four years, significantly higher levels of HRF knowledge than students that have never taken or completed a university level CBHR fitness course.

**Bergman et.al. (2005)** aimed to track the changes in growth and Health-Related Physical Fitness (HRPF) of students during a year period and also to compare them with HRPF criteria. The sample consisted of 61 students of both
sexes (31 boys and 30 girls) measured in August 2001 and in August 2002 as well. Growth was evaluated by stature and body weight and HRPF by some tests of the battery proposed by PROESP-BR, having as reference the HRPF health zone of the Physical Best (AAHPERD, 1988) and Fitnessgram (COOPER INSTITUTE OF AEROBICS RESEARCH, 1987). Data were analysed by descriptive statistics and Student’s t-test for paired samples. The results showed that students had high indexes for stature and body weight. Excepted for body composition, the students had low HRPF, presenting high prevalence of below health zone for the physical fitness components.

**Sunil Dutt. (2005)** investigated 797 male children and youth belonging to Punjab and falling in the age range of 8 to 18 years in concern with health related physical fitness. Four components of health related physical fitness namely cardiovascular endurance, muscular strength/endurance, flexibility and body composition were assessed using standard techniques. The results in general indicate a trend of improvement in cardio respiratory fitness of the boys belonging to the present study with increase in age. However when comparison is made with Prudential fitness gram standards Results indicate poor level of Vo2 max in boys of the present study, the results of muscular strength and endurance, an important health related component of fitness indicate variations in its development with respect to different body regions in boys of the present study from age 8 to 18 years. The muscles related to the upper body region like triceps, deltid, pectorals major etc. are observed to develop relatively better in their strength endurance ability than the muscles belonging to abdominal, hip and leg regions. It is believed that disproportionate development of muscular strength endurance in boys of the present study may be due to their habitual life style and a craze for some selected muscular strengthening exercises, like use of dumbbells, lifting weights etc. in order to develop their body for an attractive physical appearance. Average percent body fat of these boys at all age level is observed to fall in the health fitness zone. However the percent body fat of boys of the
present study after the age of 14 years and onwards exhibit a sharp rise, which continues up to 17 years of age.

Janet E. Fulton et.al. (2004) studied youth-oriented physical activity and physical fitness recommendations for both the public health community and the clinical community, and assesses how overweight youth are specifically targeted by each of these two groups. This review determined the extent to which the recommendations assessed four components of physical activity (i.e. frequency, intensity, duration and type) and four components of physical fitness (i.e. cardiorespiratory capacity, strength, flexibility and body composition). After identifying all current physical activity and physical fitness recommendations for youth, researchers evaluated whether public health (n = 13) and clinical recommendations (n = 12) addressed physical activity and physical fitness for overweight youth. Findings revealed inconsistent, yet explicit, recommendations for the public health community where most organisations (12 of 13, 92%) included ≥8 physical activity components. In addition, organisations encouraged volumes of daily moderate- to vigorous-intensity physical activity for youth ranging from 30–60 or more minutes. Recommendations for the clinical community generally did not provide explicit physical activity and fitness recommendations to advise physicians on the assessment and counselling of patients and their families. Overweight youth were addressed within some recommendations (6 of 12, 50%) for the clinical community, but within few recommendations (2 of 13, 15%) for the public health community. To best inform public health and clinical communities, organisations developing future recommendations should include information fully documenting the decision-making processes used to develop the recommendations.

Derri et.al. (2004) investigated the effect of an eight-week health-related fitness and nutrition education program on fitness components and dietary habits in upper elementary school students. Forty children from the fifth and-sixth grade, 10 to 12 years of age (M = 11.2, SD = 1.1), participated in the
study. The experimental group consisted of 20 children who participated in the program three days per week for one hour outside the time allotted for school physical education. The control group participated in the typical school physical education program. Health-related fitness components (cardiorespiratory endurance, abdominal strength and endurance, flexibility, and body composition) were assessed with the Prudential Fitnessgram test battery (Cooper Institute, 1992). Also, children's dietary habits were assessed based on the Health Behavior Questionnaire (HBQ) of Parcel et al. (1995) that recorded their dietary habits, after being modified to fit in the Greek diet (Bebetsos 1999). The multivariate analysis of variance for repeated measures (2x2) indicated that the group X measure interaction was significant. Children in the experimental group had better scores on cardiorespiratory endurance, on abdominal strength and endurance, and on dietary habits than those in the control group. These findings indicate that certain health-related fitness components and dietary habits as well can be improved with a three hour a week program consisting physical fitness and nutrition education activities.

Joel David Barnes. (2003) projected compared health-related physical fitness and activity between two groups of children: Old Order Mennonite children in south western Ontario (n = 124; aged 9.1 to 13.8 years), who live an agrarian lifestyle which does not include motorized transportation, computer use, or television viewing and rural children in central Saskatchewan (n = 165; aged 8.8 to 13.2 years), who live a contemporary Canadian lifestyle. The Canadian Physical Activity, Fitness, and Lifestyle Appraisal (CPAFLA) were used to measure health-related physical fitness. The CPAFLA is a battery of tests measuring anthropometry (standing height, body mass, skinfolds, and waist girth), cardiorespiratory endurance (step test), and musculoskeletal fitness (handgrip strength, push-ups, partial curl-ups, and trunk forward flexion). Physical activity was measured on seven consecutive days using the Model AM7164 activity monitor. The Physical Activity Questionnaire for Older Children (PAQ-C) was also employed. The PAQ-C is a guided, self-administered seven-day recall questionnaire, which assesses general levels of
physical activity in schoolchildren of grades four to eight during the school year. With biological age as a covariate, univariate and multivariate analyses of covariance were used to compare health-related physical fitness and activity between groups respectively. Old Order Mennonite children evinced greater mean handgrip strength ($p < 0.0001$) and rural Saskatchewan children demonstrated greater mean trunk forward flexion ($p < 0.001$). However, there were no significant differences between groups in the other health-related physical fitness variables. Old Order Mennonite children had significantly greater mean activity counts min$^{-1}$ ($p < 0.001$), mean activity counts day$^{-1}$ ($p < 0.0001$), and mean minutes of moderate physical activity day$^{-1}$ ($p < 0.0001$). Collectively, these results suggest that Old Order Mennonite children have greater static strength and are more physically active than rural Saskatchewan children. Assuming that Old Order Mennonite children represent Canadian children from previous generations, these results may lend support to secular deterioration in some aspects of health-related physical fitness and activity among Canadian children.

Tomson et.al. (2003) confirmed a negative relationship between adult depression and physical activity, there is little evidence for children. This study examined the relationship of being classified as physically active or inactive by a parent or a teacher to depressive symptoms in children 8 to 12 years of age ($N = 933$). It also assessed the relationship of playing sports outside of school, and of meeting health related fitness standards, to symptoms of depression. Relative risk of depressive symptoms for inactive classification was 2.8 to 3.4 times higher than it was for active, 1.3 to 2.4 times higher for children not playing sports outside of school, and 1.5 to 4.0 times higher for those not meeting health related fitness goals.

Takken et.al. (2003) intended to obtain insight into the interaction between daily physical activity and components of health related physical fitness in children with juvenile idiopathic arthritis. Forty five patients (10 male/35 female; mean (SD) age 8.9 (2.2) years) participated in this study.
Body mass, height, skinfold thickness, number of swollen joints, and joint range of motion were determined. The maximal oxygen consumption (VO(2peak)) was assessed during a graded maximal bicycle exercise test. Daily physical activity levels were measured with a Caltrac activity monitor and a parental physical activity rating (PAL) on a five point Likert scale. Partial correlation coefficients (to control for age) between physical activity and indices of health related physical fitness showed significant relationships between Caltrac motion counts and absolute VO(2peak) (r=0.31) and relative VO(2peak) (r=0.34), but not with the indices of body composition. There was also a significant correlation between PAL and relative VO(2peak) (r=0.33).

**Huang and Malina. (2002)** evaluated relationship between physical activity and health-related physical fitness in 282 Taiwanese adolescents 12-14 years of age. The subjects were randomly selected from the 7th, 8th and 9th grades in two junior high schools in Taiwan. Physical activity was estimated as total daily energy expenditure and energy expenditure in moderate-to-vigorous physical activity from 24-hour activity records for three days, two week days and one weekend day. Health-related fitness was assessed as the one-mile run (cardiorespiratory endurance), timed sit-ups (abdominal strength and endurance), sit-and-reach (lower back flexibility), and subcutaneous fatness (sum of the triceps, subscapular, suprailiac, and medial calf skinfolds). Physical activity is significantly and positively correlated with one-mile run performance and the sit-and-reach, but not with sit-ups and subcutaneous fatness. Overall, the strength of the relationships between estimated energy expenditure and specific fitness items in the total sample vary from low to moderate, with only 1% to 12% of the variance in fitness variables being explained by estimated energy expenditure. Comparisons of active versus inactive and fit versus unfit adolescents provide additional insights. The more active (highest quartile) are also more fit in cardiorespiratory endurance and in the sit-and-reach than the less active (lowest quartile), and the more fit in the one-mile run (better time, lowest quartile) and the sit-and-reach (highest quartile) are more active than the less fit in each item, respectively.
Boreham and Riddoch. (2001) attempted to reveal the facts in between physical activity, fitness and health of children. Children have become less physically active in recent decades, with children today expending approximately 600 kcal ´day-1 less than their counterparts 50 years ago. Although the health consequences of reduced energy expenditure in adults are well documented, there is little direct evidence linking sedentariness with health in children. However, three main benefits arising from adequate childhood physical activity have been postulated. The first is direct improvements in childhood health status; evidence is accumulating that more active children generally display healthier cardiovascular progress, are leaner and develop higher peak bone masses than their less active counterparts. Secondly, there is a biological carryover effect into adulthood, whereby improved adult health status results from childhood physical activity. In particular, childhood obesity may be a precursor for a range of adverse health effects in adulthood, while higher bone masses in young people reduce the risk of osteoporosis in old age. Finally, there may be a behavioural carryover into adulthood, whereby active children are more likely to become more active (healthy) adults. However, supporting evidence for this assertion is weak. Given this background, recent health guidelines suggesting that children should accumulate 60 min of moderate-intensity physical activity every day ± supplemented by regular activities that promote strength, flexibility and bone strength ± appear to be justified. Future developments should include the implementation of large-scale, longitudinal studies spanning childhood and young adulthood, the further refinement of tools for measuring physical activity accurately in young people, and research into the relative strength of association between fitness ± as well as activity ± and health in children. *Keywords*: exercise, obesity, osteoporosis, risk factors, young people.

Suni et.al. (1999) evaluate the validity of a Health-Related Fitness (HRFI) test battery with respect to Physical Activity (PA), we studied how PA patterns of adults are related to different components of HRFI with special interest in musculoskeletal and motor fitness. Subjects (n = 498) were middle-
aged (37-57 years) men and women, evenly selected from five age cohorts of a representative population sample. PA was assessed with a questionnaire and classified into three PA groups. Fitness assessment included 9 simple field tests. The odds ratio of low fitness (least fit 40 of the measured dimension of HRFI for three PA groups with reference to inactive group were analysed. All PA groups were strongly related to Walk Test results in both genders, and to BMI in women. Muscular type exercise was associated with modified push-ups strength and static back extension endurance in both genders, and with one-leg standing balance in women. One-leg squat for leg strength, jump-and-reach for leg power, trunk side-bending flexibility and hamstring muscle extensibility tests were not associated with PA. Five of the nine fitness tests demonstrated plausible associations with PA patterns among adults suggesting activity-related validity. An exercise intervention study is needed to evaluate the sensitivity of the tests to fitness changes.

Sallis et al. (1999) assessed the effects of a two year health-related school physical education program on standardized academic achievement scores in 759 children who completed Metropolitan Achievement Tests before and after the program. Schools were randomly assigned to condition: (a) Specialists taught the Sports, Play, and Active Recreation for Kids curriculum; (b) classroom teachers were trained to implement the curriculum, and (c) controls continued their usual programs. The Trained Teacher condition was superior to Control on Language, Reading, and Basic Battery. The Specialist condition was superior to Control on Reading, but inferior on Language. Despite devoting twice as many minutes per week to physical education as Controls, the health-related physical education program did not intervene with academic achievement. Health-related physical education may have favourable effects on students’ academic achievement.

Pate et al. (1999) examined the tracking of selected measures of physical activity, inactivity, and fitness in a cohort of rural youth. Students (N = 181, 54.7% female, 63.5% African American) completed test batteries during their
fifth- (age = 10.7 ± 0.7 years), sixth-, and seventh-grade years. The Previous Day Physical Activity Recall (PDPAR) was used to assess 30-min blocks of Vigorous Physical Activity (VPA), Moderate-to-Vigorous Physical Activity (MVPA), TV watching and other sedentary activities, and estimated Energy Expenditure (EE). Fitness measures included the PWC 170 cycle ergometer test, strength tests, triceps skinfold thickness, and BMI. Intra-Class Correlation Coefficients (ICCs) for VPA, MVPA, and after-school EE ranged from 0.63 to 0.78. ICCs ranged from 0.49 to 0.71 for measures of inactivity and from 0.78 to 0.82 for the fitness measures. These results indicate that measures of physical activity, inactivity, and physical fitness tend to track during the transition from elementary to middle school.

Charias et al. (1998) conducted meta-analysis to determine the effects of exercise on health-related physical fitness of individuals with an intellectual disability. The data came from 21 individual studies yielding 100 Effect Sizes (ESs). Large effects were demonstrated for muscular and cardiovascular endurance, moderate for muscular strength, and small for flexibility. No significant effects were found for body composition. Document source and program length influenced muscular and cardiovascular endurance outcomes, as published studies and longer programs produced larger ESs. In addition, program type influenced muscular strength (resistance programs produced larger ESs than combined programs), and program frequency influenced flexibility (higher frequency programs had larger ESs than lower frequency programs). It was concluded that additional research is needed to investigate means to improve body composition, flexibility, and muscular strength. Future studies should upgrade their standards for reporting appropriate statistical information and information related to sample and exercise prescription components.

Bailey and Biddle. (1998) described one particular community project which used HRF tests as part of exercise promotion. The purpose of such a project was to give people some indication of their present cardio-respiratory
fitness, muscular strength, and flexibility with a view to highlighting the components of HRF and areas of concern for future action. Other measures, such as self-reported activity patterns, smoking, alcohol, and diet were also taken. During the six months of the Festival in 1986, over 250,000 people visited the Health Fair (HF), and 15,000 volunteered to take the fitness tests; 13,373 were actually completed. As part of the evaluation of the HRF tests at the HF, a sample of 3,000 (500 per month) was used. A follow-up survey on 350 was mailed 12 months after the end of the Festival and 173 people replied. The follow-up survey showed that just under 50 per cent of males followed their 8-week exercise programme (given to them after their HRF tests) for the recommended time period. However, this figure dropped to 21.4 per cent for females. Of those who started exercise after their HRF tests, 12.5 per cent (females) and 18.4 per cent (males) gave up within two months, otherwise most were still involved (87.5 per cent females, 71.4 per cent males) after 12 months. Subjective feelings reported in the follow-up survey were generally positive with the majority 'feeling fitter' and reporting being mentally alert, having more energy and feelings of well-being. There was some indication that other health behaviours changed alongside exercise.

Suni et.al. (1998) the main objective of this research was to evaluate the health-related content validity of nine fitness tests by studying how low, mid, and high levels of fitness are associated with perceived health and musculoskeletal functioning. The Design of this study was Cross-sectional methodological study. Middle-aged (37 to 57 years) men (n = 245) and women (n = 253), evenly selected from five age cohorts of a random population sample. The main outcome of this study was the odds ratios (ORs) of selected health outcomes for low (least fit 20%), mid (next 40%), and high (most fit 40%) fitness categories in the different tests adjusted for several possible confounders. Cardiorespiratory fitness, as measured by 2-km walk test, was strongly and consistently associated with perceived health and mobility (stair climbing) in both genders (range of ORs, 2.4 to 17.6), and a somewhat weaker relationship was found with leg power and with leg strength (ORs, 2.5 to 7.2).
Low fitness in back muscular endurance and upper-body strength were associated with mobility disability (ORs, 2.8 to 8.5) and with back dysfunction and pain (ORs, 2.9 to 6.1). High fitness in back endurance in men and in balance in women were related to positive back health (ORs, 2.5 to 3.7). Body mass index was associated with musculoskeletal disability in women (ORs, 2.4 to 5.3). Balance, leg strength, and leg flexibility in men; and leg power, trunk and leg flexibility in women were not associated with health outcomes. Among a middle-aged population, the majority of the evaluated fitness tests demonstrated health-related validity by strong associations with perceived health and musculoskeletal functioning, and by weaker associations with back symptoms.

Lamb et al. (1998) focused on the concept of positive health and, in particular, recognizes the importance of physical fitness. It is argued that measures of physical fitness are indicators of positive health and such measures are identified under their discrete headings of agility, flexibility, power, speed and reaction time, strength, cardiovascular capacity, body composition and posture. The theme of health-related fitness is explored, with recognition of its increasing importance for health promotion in schools, the community and commerce. Evidence is presented that highlights the general acceptance of the importance of certain fitness components in the assessment of the positive health of populations. In addition, an alternative method of assessing fitness is discussed, arising from the authors' recognition of its potential as an inexpensive, easily administered indicator of one aspect of positive health. The case for using subjective indicators of positive health is also presented—the argument being that subjective health could be a possible mediator in the attainment of positive health.

Miller and Housner. (1998) assessed the health-related physical fitness knowledge of pre-service and in-service physical educators and graduate students in physical education and exercise physiology. A 40 item multiple choice examinations was designed and validated in order to assess knowledge
in five domains of health-related fitness: (a) body composition, (b) flexibility, (c) muscular strength, (d) muscular endurance, and (e) cardiovascular conditioning. Results indicated that exercise physiology graduate students surpassed all other groups of participants. They achieved a mean total score of 83.18%, while other participants scored lower with mean total scores ranging between 54.27% and 71.75%. A trend analysis conducted for pre-service teachers indicated, however, that knowledge progressively increased with experience in the teacher education program. Explanations for the poor performance of physical education teachers and suggestions for future research are discussed.

Sallis et.al. (1997) this study evaluated a health-related physical education program for fourth- and fifth-grade students designed to increase physical activity during physical education classes and outside of school. METHODS: Seven schools were assigned to three conditions in a quasi-experimental design. Health-related physical education was taught by physical education specialists or trained classroom teachers. Students from these classes were compared with those in control classes. Analyses were conducted on 955 students with complete data. RESULTS: Students spent more minutes per week being physically active in specialist-led (40 min) and teacher-led (33 min) physical education classes than in control classes (18 min; P < .001). After 2 years, girls in the specialist-led condition were superior to girls in the control condition on abdominal strength and endurance (P < .001) and cardiorespiratory endurance (P < .001). There were no effects on physical activity outside of school.

Jalava and Epilepsia. (1997) tried to show any possible associations between childhood-onset epilepsy and physical activity, health-related fitness, and health experience. A population-based cohort of 176 patients with epilepsy since childhood was monitored for a mean of 35 years. Patients with recurrent, unprovoked epileptic seizures with no associated initial neurologic impairment or disability, termed those with "epilepsy only" (n = 100), were compared with
matched controls for self-reported physical activity, health experience, laboratory tests, body mass index, and muscle power tests. On the basis of muscle tests, physical fitness proved to be significantly poorer in patients with "epilepsy only" than in matched controls. During the preceding year, 22% of patients and 24% of controls had reduced their physical activities because of some illness; only 2% reduced their physical activities because of epilepsy. No significant difference was found in blood status, except for a lower serum creatine level in the patients. Current antiepileptic drug (AED) therapy appeared significantly associated with lower haemoglobin and creatine levels and higher high-density lipoprotein values. The patients perceived their health status to be comparable with that of controls, irrespective of physical inactivity, continued seizures, or AED monotherapy. However, patients receiving AED polytherapy perceived their health as rather poor or very poor significantly more often than did controls.

Ajwang et.al. (1997) attempted to reveals the Effect of physical education programmes on health related fitness components (cardiorespiratory endurance, low back flexibility and body composition) of physically challenged pupils. The main objectives of the study to evaluate the effect of Physical education (PE) programmes in the improvement of health related fitness variables. Methodology and Results: Health-related fitness levels of persons with physical disabilities who participated in an eight week physical education programme were measured using the project UNIQUE physical fitness test battery of Win nick and Short (1985). The study group comprised of 17 boys and 14 girls from classes five, six and seven. Pre-test and post-test design was used in this study. A pre-test was carried out two weeks after school opening, from a five week vacation from December to January of 2009 and a post-test eight weeks later at the end of the treatment period. The data collected was descriptively analysed and one-way ANOVA was computed to determine the significance of difference between pre and post-test means of the dependent variables under investigation, by gender and across the ages. The following hypothesis was tested in this study: - HO1 Ŧ there was no
significant difference between the pre-test and post-test data results with regard to the following variables of the physically challenged: cardio-respiratory endurance, low back flexibility and percent body fat. HO2 Ń there was no significant difference according to the gender on health-related fitness levels of the physically challenged pupils of Joy land Special School in relation to gender at pre-test and post-test. The null hypotheses were rejected at P<0.05 level of significance. The findings showed that the pupils had a lower fitness level at pre-test compared to after PE program. This study further established that in cardio respiratory endurance boys performed better than girls, while in low back flexibility both boys and girls demonstrated an improvement across all age groups. The overall findings of the study established that there were significant improvements on cardio respiratory endurance and low back flexibility. However, improvements on body composition were not statistically significant at p< 0.05 level.

Strand and Reeder. (1996) endeavoured to reveal the facts about Increasing Physical Activity through Fitness Integration. The amount of time school-children spend in physical activity during physical education classes concerns many teachers and researchers. A number of writers have suggested that because school physical education is the only class that can address the health-related physical activity needs of naturally all children, it should be the "primary" target for increasing participation in physical activity (Bar-Or, 1987; McGinnis, Kanner, ScDeGraw, 1991; Sallis& McKenzie, 1991) Simons-Morton et al., 1988). The potential impact of school physical education programs on health promotion and physical fitness is widely recognized. In controlled studies, it has been found that the quantity and quality of school physical education programs have a significant positive impact on the health-related fitness of children and youth f Cooper et al., 1975; Duncan, Boyce, Itami, &Puffenbarger, 1983). Leading researchers are beginning to question the American College of Sports Medicine (ACSM, 1990) long-standing recommendation of at least 20 minutes of exercise at 60 percent of maximum heart rate for at least three days per week, suggesting instead that any daily
exercise at a moderate intensity level might be sufficient (Blair, 1993; Corbin, Pangrazi, & Welk, 1994; Simons-Morton et al., 1990). This change in exercise standards is fortunate for public school physical educators, who often have difficulty devoting 20 minutes strictly to cardio-vascular fitness development while still focusing on skill development in classes that are less than an hour in length. Sidentop (1992) encouraged physical educators to "experiment with different formats for organizing and presenting physical education" (p. 69), and "restructure, take risks, and produce results" (p. 70). The challenge for physical educators who continue to emphasize skill development in traditional activity units is to enhance fitness opportunities without necessarily detracting from skill development. For fitness development to become a vital component of a physical education program, daily lessons must include activities designed specifically to increase the amount of time students are engaged in moderate-to-vigorous physical activity. With this objective in mind, we have conducted descriptive and experimental studies designed to compare the effects of instructional strategies and formats on variables such as heart rate intensity, skill development, and student attitudes toward activity (Anderson, 1994; Quinn & Strand, 1995; Strand, 1995; Strand & Reeder, 1993a; Strand & Reeder, 1993b). From these studies we have determined the following: 1) Even in the best of instance, it appears that a majority of secondary students fail to meet ACSM exercise standards. 2) Middle school students are more engaged than high school students at both moderate and vigorous intensity levels. 3) Through the implementation of various teaching strategies, the amount of time within a predetermined training zone can be increased. 4) Time within a predetermined training zone can be maintained without sacrificing skill development if a class is structured properly. 5) In some cases, the cardiovascular workouts students receive from game play are as effective as those they receive from specifically designed fitness activities. 6) From our findings it appears that instructional strategies and instructional formats do affect student outcomes in terms of the amount of time above a predetermined heart rate training zone, the percentage of students who meet suggested
exercise guidelines, student skill achievement, and student attitudes toward physical activity. As a result, we have fashioned what we call the fitness integration method of teaching (Strand, Reeder, Scantling, & Johnson, 1996). With fitness integration, seven planned phases are included in activity unit lesson plans: pre-class activity, fitness lecture, skill development, integration game activity, traditional game play, fitness activity, and closure activity. The amount of time a teacher allots for each lesson phase during a particular class period will depend on factors such as length of class, grade level, and lesson objectives. The phases do not necessarily have to occur every day, nor do they have to occur in the order in which they are listed. Many teachers begin their classes with a fitness activity, while others end with a fitness lecture. Whatever sequence they choose, it is important that teachers actually plan each of the phases rather than have them to chance. A description of each lesson phase, accompanied by teaching strategies to help make traditional physical education classes more fitness-oriented, follows. The teaching strategies reveal how teachers can include daily fitness without making drastic program changes.

Pre-class Activity: The pre-class activity, what we call the Early Bird Special (EBS) (Strand, Quinn, Reeder, & Henke, 1994) is a planned activity for students who arrive early to class.

Suni et.al. (1996) tried to reveals the reliability of balance, flexibility, and muscular strength. These items were examined by a health-related fitness (HRF) test battery for adults. This study was a Methodological study. In study A, volunteers (n=42) from two worksites participated. In study B, a population sample (n=510) of 37-to 57-year-old men and women was selected. Intra-class correlation coefficient of repeated measures was used to assess inter-ratter reliability. The degree of measurement error was expressed as the standard error of measurement. The mean difference with 95% confidence intervals between the testing days or test trials was used to assess test-retest or trial-to-trial reproducibility. The coefficient of variation (CV=SD/mean x 100%) from day to day was also calculated. The following tests appeared to provide acceptable reliability as methods for field assessment of HRF: standing on one
leg with eyes open for balance, side-bending of the trunk for spinal flexibility, modified push-ups for upper body muscular function, and jump and reach and one leg squat for leg muscular function. This reliability assessment provided useful information on the characteristics of potential test items in a HRF test battery for adults and on the limitations of its practical use. Testers must be properly trained to ensure reliable assessment of HRF of adults.

Curtner Smith et al. (1995) observed secondary school physical education lessons on a variety of activities and determined (a) the percentage of lesson time pupils were engaged in moderate to vigorous physical activity (MVPA), (b) the percentage of lesson time allocated by teachers for pupils to engage in fitness activity or acquire health-related fitness knowledge, and (c) the percentage of time teachers used behaviour likely to encourage pupils to participate in health promoting physical activity. Subjects were 20 physical education teachers working in one town in south-west England. Two lessons of each teacher's choice in which they taught any activity to Years 7, 8, or 9 were videotaped. Lessons were coded with SOFIT, an observational instrument developed to quantify factors thought to promote health-related fitness in physical education. Data generated by SOFIT were entered into a SAS programme to produce descriptive statistics. Results indicated that pupils spent little time in MVPA likely to promote health benefits that teachers allocated no time for pupils to engage in fitness activities or receive fitness knowledge, and that teachers spent no time directly promoting or demonstrating fitness.

Anita et al. (1993) evaluated health-related quality of life in relation to endurance exercise over the prior year for 194 previously sedentary, healthy men and women aged 50–65 using a post-test-only design. Three exercise regimens were studied that varied in format (class-based vs. home-based) and intensity (higher vs. lower). In all regimens, subjects who participated more had better physical health 12 months after program initiation (p values < .05); no differences were observed in general psychological well-being. Extent of
participation, rather than format or intensity of exercise, was associated with better physical health in this population.

**Bazzano et.al. (1992)** examined the relationships among the AAHPERD Best Health Related Physical Fitness Test (HRPFT) items to resting blood pressure in 80 boys and 84 girls from the Lanciano, Italy, school system. Systolic Blood Pressure (SBP) was significantly associated with age for both sexes. Diastolic Blood Pressure (DBP) for boys was found to be associated with fatness when age was held constant. To examine the relationship between blood pressure and the HRPFT, data were sorted into two groups of students passing or failing to meet the Criterion-Referenced Standard (CRS) by 1-mile run performance and sum of skinfolds. SBP did not differ significantly between groups for either sex. Boys who failed to meet the CRS for 1-mile run performance showed a higher DBP of 4 mmHg when compared to boys who achieved the CRS. The group passing the aerobic fitness and body composition tests tended to perform better on all test items. With the possible exception of DBP for boys, it is concluded that performance on the Physical Best HRPFT is not associated with resting blood pressure in children and adolescents.

**Thomas et.al. (1991)** collected data for the analysis was the health related fitness scores, anthropometric measures, and physical activity information from the National Children and Youth Fitness Study. The subjects were 6,800 boys and 6,523 girls, ages 6 through 18. Multiple regressions produced linear composites that were used as covariates to evaluate physical and environmental characteristics that relate to gender differences. The distance runs, chin-ups, and sit-ups displayed similar patterns in gender differences across age. Before puberty the important covariates are mainly physical, namely skinfolds. Following puberty the major factors that reduce gender differences are skinfolds and the amount of exercise done outside of school time.

**Caspersen et.al. (1985)** proposes definitions to distinguish them. Physical activity is defined as any bodily movement produced by skeletal
muscles those results in energy expenditure. The energy expenditure can be measured in kilocalories. Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities. Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness. Physical fitness is a set of attributes that are either health- or skill-related. The degree to which people have these attributes can be measured with specific tests. These definitions are offered as an interpretational framework for comparing studies that relate physical activity, exercise, and physical fitness to health.

**Haskell et.al. (1985)** on the way to improve health and fitness effectively through physical activity or exercise, we need to understand how this comes about. For many of these changes, the stimulus has been grossly defined in terms of type, intensity, duration, and frequency of exercise, but for others a dose-response relationship has not been determined. Physical activity that appears to provide the most diverse health benefits consists of dynamic, rhythmical contractions of large muscles that transport the body over distance or against gravity at a moderate intensity relative to capacity for extended periods of time during which 200 to 400 kilocalories (or 4 kilocalories per kilogram of body weight) are expended. For optimal health benefits, such activity should be performed daily or at least every other day and should be supplemented with some heavy resistance and flexibility exercises. The greatest benefits are achieved when the least active individuals become moderately active; much less benefit is apparent when the already active individual becomes extremely active. Overexertion or inappropriate exercise can produce significant health risks. Research is needed to characterize better the health-promoting features of physical activity and exercise.