REVIEW OF RELATED LITERATURE

Sincere efforts have been made by the researcher to locate literature related to this study. The relevant studies found from various sources, which the researcher has come across are cited below.

There are number of study have been conducted on Aerobic training and find positive effect of Aerobic training practices on physiological parameters.

Dilek Sevimli et al. (2009) conducted a study on “The Effect of Aerobic Exercise on Cardiopulmonary System in Children” AIM: The purpose of this study is to investigate the changes in cardiopulmonary system stimulated by aerobic exercise in different age group of children and to find out in which age group aerobic exercise is more effective.

METHOD: Totally, 76 children participated in this study. Ages of the participants ranged between 11–17, and mean age were 14.08±0.65. Participants were divided into three groups according to their age range. There were 23 in the first and second and 30 participants in the third group, (15–17), (13–14) and 30 (11–12) respectively. Each of the groups then was divided into two parts one of which was experimental and the other was control group. During 8 weeks, a training programme based on doing aerobic exercise lasting one hour 3 days a week was performed in the experimental groups. Before and after training, EKG, spirometer, blood pressure, heart rate, PWC 170 test of the participants, which was the data collection method, were recorded. The results obtained were compared through t test method of SPSS.

RESULTS: The results revealed a decrease in the systolic blood pressure and in the heart rate of those who did exercise as opposed to those who did not do exercise in Group I. In addition, R wave height in V6 of exercise group showed a statistically significant increase. As for second group, it was determined that the R/S, at V1 derivation obtained from the participants who did exercise showed a statistically decrease as compared to those of the participants who did not do exercise. In the third group, no changes were observed in the systolic blood pressure the heart rate, R wave height in V6 and R/S although the measures of PWC 170 test, VC and FVC obtained from all training groups made a significant increase when compared to those of control groups.

CONCLUSION: The results of this study revealed that of the three groups the 15–17 age groups was affected mostly by the aerobic exercise on kardiyopulmoner sytem. The results suggest that the exercises performed with this group affected the participants positively, which should be taken into consideration for further research.

Milena Mikalacki et al. (2012) conducted a study on “The differences in aerobic capacity of physically active females in relation to their age” The aim of this research was to establish whether there are statistically significant differences among three groups of individuals that exercise actively, concerning the indicators of aerobic capacities, and in relation to their age. The sample of individuals consisted of 72 women in total (aged 20-49) who exercised actively in the World Class fitness club, Novi Sad. The individuals were grouped into three sub-samples according to their age. The first sub-sample consisted of individuals aged 20-29 (N=22), the second sub-sample of individuals aged 30-39 (N=28) and the third one of individuals
aged 40-49 (N=22). The application of a multivariate and univariate analysis, as well as the t-test for independent samples, established statistically significant differences of the indicators of aerobic capacities on the quantitative level among all three groups of females and in favor of the younger women. The application of a univariate and multivariate analysis of variance, followed by the t-test for independent samples, which showed that there are statistically significant differences between aerobic capacity indicators at the quantitative level among the three groups of women and that they are in favor of the younger women. Those differences can be noted in the variables of peak heart rate, heart rate at peak oxygen uptake, relative oxygen uptake, duration, and speed test runs at peak oxygen uptake. Based on these results it can be concluded that there are significant differences in the aerobic capacity of women belonging to different age groups on the quantitative level. The women belonging to the group aged 20-29 showed better aerobic performance than the other two analyzed groups, aged 30-39 and 40-49.

N Bijeh et. Al (2012) conducted a study on “The Effect of Aerobic Exercise on Serum C-Reactive Protein and Leptin Levels in Untrained Middle-Aged Women.” The aim of this study was to determine the effect of aerobic exercise on serum inflammatory markers in untrained middle-aged women.

Methods: Nineteen healthy female middle-aged were selected by convenience sampling method and were randomly divided into two experimental (n=11) and control (n=8) groups. The exercise protocol included aerobic exercise training lasted for 6 months and 3 sessions per week and every session lasted for 60 minutes and with intensity of 55-65 percent of maximum heart rate reserve (MHR). Blood samples were taken to measure serum leptin and C-Reactive Protein (CRP) before and after aerobic training period. General linear-Repeated measures (GL-RM) was used to comparing of within, Interactive and between means groups. The level of significance was set at P< 0.05.

Results: The level of serum leptin in middle-aged women did not change significant. However, the levels of CRP during this period did not change significantly.

Conclusion: Six months of aerobic exercise does not induce significant change in serum levels of CRP, while leptin levels reduced in middle-aged women. Regular physical activity probably causes decrease in serum leptin level if body mass index and body fat mass reduce simultaneously.

Sanja Mandarić et. Al (2011) “Effects of a high-low aerobic program on the morphological features, functional and motor abilities of female elementary school eighth graders.” The research was carried out on a sample of 31 female students, eighth graders from elementary school “Vožd Karađorđe” in Leskovac, who were divided into two groups: an experimental (N=16) and control (N=15) group. The principal aim of the research was to establish the effect of programmed instruction of high-low aerobics on the morphological features, functional and motor abilities of female elementary school 8 graders. The effects of a high-low aerobic program were monitored in the area of morphological features (eight variables), in the area of functional abilities (one variable) and in the area of motor abilities (12 variables). The experimental factor was represented by specially programmed high-low aerobic instruction, which lasted for eight weeks, and was realized during the course of regular PE classes. The control group attended the program prescribed by the National Curriculum of the Ministry of Education of the Republic of Serbia. The research
results indicated that the high-low aerobic program led to an improvement in the morphological features, functional and motor abilities of the female students from the experimental group when compared to female students of the control group. The results obtained by the research indicated the positive aspects of high-low aerobics for the preservation of children’s regular growth and development and its practical implementation in PE classes.

Kristjan Thor Magnusson et al (2012), “Limited effects of a 2-year school-based physical activity intervention on body composition and cardiorespiratory fitness in 7-year-old children” This study was to assess the effects of a 2-year cluster-randomized physical activity and dietary intervention program among 7-year-old (at baseline) elementary school participants body composition and objectively measured cardiorespiratory fitness. Three pairs of schools were selected and matched, then randomly selected as either an intervention (n = 151) or control school (n = 170). None of the effect sizes of body composition were statistically significant. Children in the intervention group increased their fitness by an average of 0.37 z score units more than the controls (95% CI: 0.27 to 1.01, P = 0.18), representing an improvement of 0.286 W/kg. Boys had higher fitness (mean difference 0.35 z scores, 95% CI: 0.13–0.58, P = 0.001) than girls, independent of study group, fitness z score at baseline and body mass index. Post hoc analysis showed that the intervention school with the highest fitness z score change was significantly different from two of the lowest control schools (mean difference 0.83 z scores, 95% CI: 0.44–1.21, P < 0.0001 and mean difference 0.70 z scores, 95% CI: 0.29–1.10, P = 0.01), but it was also significantly different from the lowest intervention school (mean difference 50.59 z scores, 95% CI: 0.19–0.99, P = 0.05). The results of this intervention are inconclusive as regards to the effects on fitness, but the intervention did not have any statistically significant effect on body composition.

Joav Merrick et al. (2013), “Effects of Aerobic Exercise on Body Composition and Muscle Strength in Over-Weight to Obese Old Women with Intellectual Disability: A Pilot Study” - To examine the effect of treadmill walking on over-weight to obese females with unspecified mild ID (intellectual disability).

Method: Randomized assignment to an aerobic exercise group (G1, n = 6) and control group (G2, n = 3). The G1 performed mild to moderate intensity walking for 25–45 minutes per exercise session, 3–5 times per week up to a weekly walking of 150 minutes, for 32 consecutive weeks. The G2 maintained routine daily activities. Results: The mean age of the study subjects was 57.2 ± 7.5 years, BMI was significantly decreased at the conclusion of the intervention (P = 0.005). In the G1, the subcutaneous fat area was also significantly decreased (P = 0.005) but not in G2. No change was there in the visceral fat area of both groups. The quadriceps muscle maximal isometric muscle strength of the G1 and G2 did not change.

Conclusion: Long term mild to moderate intensity of aerobic physical exercise for overweight to obese women with ID is a feasible and effective plan in reducing subcutaneous fat mass, while muscle strength remains unchanged.

Daniels. Rooks et al (2002), “The Effects of Progressive Strength Training and Aerobic Exercise on Muscle Strength and Cardiovascular Fitness in Women With Fibromyalgia” - To determine the safety, feasibility and consequences of a program of progressive strength training and cardiovascular exercise in women with fibromyalgia syndrome (FMS). Methods. Fifteen women with confirmed FMS were monitored for injury and exercise compliance, and assessed
formuscle strength (1-repetition maximum technique), cardiovascular endurance (6-minute walk test), and functional status (Fibromyalgia Impact Questionnaire [FIQ]) before and after a 20-week exercise intervention.

Results. Zero injuries and an 81% compliance rate occurred during training. Improvement was seen in muscle strength of the lower (191 ± 75 to 265 ± 67 pounds; P < 0.001) and upper (61 ± 18 to 76 ± 18 pounds; P < 0.001) body, 6-minute walk distance (530 ± 80 to 629 ± 74 meters; P < 0.001), and in FIQ score (44 ± 9 to 32 ± 14; P < 0.01).

Conclusion. A program of progressive strength training and cardiovascular exercise can be safe, well tolerated, and effective at improving muscle strength, cardiovascular endurance and functional status in women with FMS without exacerbating symptoms. This program may also contribute to a reduction in the severity of several symptoms.

Geogory conducted research on untrained college males who were randomly assigned to one of two experimental groups and a control group. He took four, seven and seven subjects in the control, interval running and continuous running groups respectively. Training consisted of jogging or running on a quarter mile track for a distance of two miles, five days a week and for the period of six weeks. The intensity of run was controlled by keeping the pulse count at 162 beats and 174 beats per minute, for continuous and interval groups respectively. It was concluded that continuous and interval training methods were equally effective in developing aerobic capacity when the same total work is performed.

Dupper Michel Alfred studied the effect of an aerobic program on the physiological, cognitive and behavioral functioning of institutionalized retarded children. The subjects, aged twelve to eighteen were randomly divided into experimental (Group I) treatment and control (Group II) groups. Group 1 participated in a 30-minute aerobic exercise program three times per week for ten weeks. Group II spent the same amount of time participating in physical education motor skills class. All subjects were evaluated at a beginning and end of the ten week period with the Durnin and Rahaman skin fold estimate of body fat, the skubic-Hodgkins slip test, 600 yard run/walk, goal attainment scale, and vinel and adaptive behaviours scales socialization. A post test revealed a significant improvement among the experimental treatment group within the areas and body fat composition and cardiovascular efficiency. Cognitive and behavioral functioning did not improve significantly as a result of the treatment.

Davies selected 118 university students to study the effects of three work intensity training programs on cardio-respiratory fitness. The subjects were assigned to one of the three experimental procedures or the control group. The methods of training experimental procedures or the control group. The methods of training employed were the crest load training procedure, continuous running and high intensity running. The subjects followed a prescribed workout procedure for thirty minutes each session three times a week for six weeks. It was concluded that three training groups showed significantly greater improvement in cardio-respiratory fitness than did the control group. However, no significant difference was demonstrated among three training
procedures. It was also concluded that reduction in resting pulse rate indicated the continuous running to be superior to the crest load training procedure.

Jessica L. Goulder, found the Effects of Endurance Training and Short-term High Intensity Sprint Training on Performance and Endurance Related Variables in Well-trained Endurance Cyclists. Recent research has suggested supramaximal training can be an effective means of improving endurance performance; however ultrahigh intensity training (UHIT) has not been examined as a replacement of training volume in a well-trained endurance population. Overuse-related injuries, recurring illness, feelings of staleness, and overtraining that are often associated with high volume training may be avoided with low volume, UHIT training. Purpose: The purpose of this study was to compare the effects of two weeks of low volume UHIT with two weeks of traditional HV endurance training on lactate threshold (LT), VO2max, steady state efficiency, substrate utilization rates, and 25K time trial performance in well-trained endurance athletes. Method: Twenty (VO2max ≥ 55 ml/kg/min or 4.5 L/min and minimum training volume of 150 km/week) male cyclists were match-paired into two groups. Four two-day testing sessions were performed at 0, 2, 4, and 6 wks. Day one of testing measured VO2max and lactate threshold. Day two involved a 10-min steady state ride followed by a 25K time trial. All participants were tested, and then continued two weeks of their endurance training. Following a retest, the controls (CON) continued with their endurance training while the other half (INT) replaced their endurance training with UHIT, consisting of a 10-min warm-up followed by 8-10 x 30 sec sprints at a workload of 0.075 kg/kg body weight and 4.5 min recovery. Participants completed 6 training sessions over two weeks with two optional low intensity endurance days. Following the second phase all participants re-tested then either continued with (CON) or returned to (INT) their individual endurance-training regimen. A final testing session was conducted two wks later. Results: There were no significant differences between the two groups in VO2max or LT (% of VO2max). In addition, cycling efficiency, steady state VO2 and heart rate, and 25K time trial performance were not different. Discussion: A short-term reduction in training volume replaced by relatively short sessions of supramaximal training can affectively maintain endurance cycling performance for well-trained cyclists. This type of training may be useful as a means of decreasing the occurrence of negative consequences of long-term, high volume training.

Jacqueline Williams, conducted the study to see the effects of a Ten-week Aerobic Exercise Training Program on Cardiovascular Variables: Assessed to Predict Change of Blood Pressure in Prehypertensive African American Women One out of four Americans has Hypertension (HTN). Furthermore, HTN is more prevalent in African American women than any segment of the population. Research has shown that blood pressure as low as 115/75 has a positive relationship with an increase risk of cardiovascular disease and doubles the risk with every rise of 20/10mmHg. Thus, health associations have determined a new category of blood
pressure called prehypertension. Aerobic exercise training decreases blood pressure significantly. There are few studies on African American women and how exercise affects blood pressure. The exercise related variables that are of interest include cardiac output (CO), heart rate (HR), total peripheral resistance (TPR), stroke volume (SV), peak volume of oxygen consumption (VO2peak) and blood pressure. Therefore, the purpose of this study is to determine if the changes of the cardiovascular variables that may occur during a ten week exercise training program can predict a decrease of blood pressure in prehypertensive African American women. A total of 12 sedentary women that met the inclusionary criteria were taken through three pre-training visits. These visits include orientation, pre-VO2peak test, and pre-CO2 rebreathing test. Orientations consisted of paperwork explaining confidentiality through HIPPA regulation and inform consent. The VO2peak test was performed on a cycle ergometer using a 2 minute protocol while monitoring with a standard 12-lead ECG system. The third visit consisted of a standard procedure of indirect non-invasive CO2 rebreathing test to determine CO, SV, and TPR. The CO2 rebreathing test was performed on a cycle ergometer while monitoring with the ECG system. Following testing subjects (n=12) trained for ten weeks three times a week thirty minutes a session at 70% of their VO2peak with increases of intensity every 2 ½ weeks. Once training was completed, the subjects repeated the VO2peak test and CO2 rebreathing test to obtain post values. Using the SPSS statistical analysis software and a paired sample t-test, I observed that there were not any significant changes from pre-and post-training for HR, SBP, DBP, and MAP. However, there were significant changes (p<.05) from pre-to post-training in VO2peak, SV, CO, and TPR. VO2peak increased from 19.05 +/- 3.92 ml/kg/min to 23.02 +/- 3.92 ml/kg/min. SV increased from 34.17 +/- 11.82 mL to 43.83 +/- 14.03 mL. CO increased from 3.12 +/- 0.99 L/min to 3.99 +/- 1.35 L/min. TPR decreased from 35.56 +/- 17.67 mmHg*L/min to 27.00 +/- 14.9567 mmHg*L/min. Six subjects decreased either SBP or DBP to normotensive values. Ten-weeks of aerobic exercise training are effective and can elicit changes in the cardiovascular variables of prehypertensive African American women. Uncontrolled factors with the subjects. Normal human physiology can cause unwanted changes in the hemodynamics. Therefore, my results may not have demonstrated true training effects and could not be used to make observation of prediction. A revised study will be significant to observe the underlying cardiovascular variables associated with prehypertensive African American women and use exercise as an intervention to decrease the risk of developing full-blown hypertension.

Satoshi Kido, conducted the study to see the combined training with breathing resistance and sustained physical exertion was carried out to evaluate its physiological effects and its effect on improve endurance capacity. The subjects were nine healthy adults (mean age 20.4, SD ± 1.7 years). The combined training group (n = 5) carried out 6 weeks of combined training using a cycle ergometer, with exercise load tests and respiratory function tests performed before and after the training. The results of the training were compared to a control group (n = 4) that only performed the cycling exercise without the combined training with breathing resistance. In the combined training group, ventilatory threshold, maximal load of the cycle ergometer in exercise
load tests, and maximal voluntary ventilation increased after training. These increases after training were all significant, but none of these variables changed significantly in the control group. The results imply that in comparison to conventional training methods, combined training with breathing resistance and sustained physical exertion is beneficial for increasing endurance capacity and respiratory muscle function. This result provides important information regarding the effects of the new training method for improving endurance capacity.

Meneval studied eighty males subject to determine the effects of a three day per week, eight week variables resistance weight training program in VO2 max, body composition, performance and two mile run, resting heart rate, time to 170 heart rate, blood pressure and systolic tension time index. Subjects were randomly assigned to high intensity circuit weight training equipment for a period of eight week. It concluded that the nautilus segments of high intensity or low intensity does not affect the performance of two mile run.

Gillespi studied the effects of three selected weight training programs on strength and muscular endurance. Sixty two healthy male volunteers were randomly assigned to one of the three groups who trained thrice a week for 9 weeks. ANOVA was the statistics used in this study. It was concluded that significant gains in strength and muscular endurance were the result of high resistance low repetition, low resistance high repetition or combination of both.

Foley conducted a study on the effect of circuit training programme on predicted oxygen uptake of pre pubescent children. A continuous sub max bicycle ergometer test for prediction of maximal oxygen uptake was used to determine the effect of 8 weeks of training on 15 volunteers students’ age 10-11 years. Subjects for the study were randomly selected from an elementary school V grade class. The experimental group trained three times per week for 8 weeks in a circuit training programme at a target rate of 70% of age predicted VO2 max for 30 minutes per section acting as a control group, 12 students participated in organised game and sport activities for equivalent periods of time. A pre test and post test design utilizing ANCOVA revealed no significant difference at the 0.05 level between groups. It was concluded that although improvement is evident in the experimental group. It was equated whether the results were attributed to the training programme.