CHAPTER - II

REVIEW OF RELATED LITERATURE

The review of literature is instrumental in the selection of the topic, formulation of hypothesis and deductive reasoning leading to the problem. It helps to get a clear idea and supports the finding with regard to the problem under study.

The researcher came across several books, periodicals and journals and published thesis, while searching for relevant facts and finding that were related to this present study, such as those were given below or the better understanding and to justify the study.

The related literatures were broadly classified into the following six categories:

1. Studies on Obesity Management
2. Studies on Aerobic Training
3. Studies on Fitness variables
4. Studies on Physiological variables
5. Studies on Biochemical variables
6. Studies on Psychological variables
2.1 STUDIES ON OBESITY MANAGEMENT

Kim Y, et.al. Documented that the majority of adults in the United States do not meet the recommended levels of healthy lifestyle related behaviours. The Nutrition and Physical Activity (NuPA) study was designed to promote fruit and vegetable consumption, physical activity, and weight management for a working population. **METHOD:** Data were collected nationwide, USA, from 2005 to 2007 and analysed in 2008. A total of 2470 employed participants were randomized into the self-help (SH: n=1191) or self-help plus telephone counselling (SH+C: n=1279) group. The SH+C group received nine structured telephone counselling sessions in addition to the print materials. **RESULTS:** A series of hierarchical regression analyses for each of the health behavior outcomes in the present-at-follow-up subsample (n=1098-1148) revealed that the SH+C was effective in increasing fruit and vegetable consumption. Among the overweight and obese participants, weight loss was significant in both the SH and SH+C groups. **CONCLUSION:** Using a theory-based behavioural change counselling technique and targeting multiple health behaviours

among employed individuals, our findings demonstrate that the addition of telephone counselling to mailed self-help materials is effective in promoting healthy diet and weight management.

Wax JR. explored recent developments in obesity-related topics of interest and importance to obstetricians. Specifically addressed are the impact of gestational weight gain on perinatal risk, the increased risk of congenital anomalies in offspring, developmental origins of health and disease in offspring, and reproductive issues following bariatric surgery. **RECENT FINDINGS:** Limiting maternal weight gain in obese women to less than 15 lb may favourably attenuate perinatal risk (macrosomia, caesarean delivery, and preeclampsia) but increase risk for small-for-gestational-age newborns. Obese women are at significantly increased risk for offspring to develop open neural tube defects and congenital heart disease as well as other anomalies. Impaired sonographic visualization in this population may impede prenatal diagnosis of these serious birth defects. Intrauterine nutritional overabundance may cue adaptive fatal responses predisposing to childhood and adult obesity as well as the metabolic syndrome.

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Bariatric surgery, the only effective treatment for morbid obesity, causes lifelong physiologic and anatomic changes associated with significant reproductive implications. Procedures can predispose to caloric and micronutrient deficiencies, improved fertility and fecundity, and late surgical complications. Pregnancy outcomes are typically similar to those of women without previous bariatric surgery and better than those of untreated morbidly obese women.

**SUMMARY:** Obesity and its surgical treatment are associated with lifelong health implications for the mother as well as her offspring. An appreciation of these obesity-related reproductive issues is critical for optimal care of this growing segment of the female population.

**Florindo A.A.**

estimated the prevalence of and identify factors associated with physical activity in leisure, transportation, occupational, and household settings. **METHODS:** This was a cross-sectional study aimed at investigating living and health conditions among the population of São Paulo, Brazil. Data on 1318 adults aged 18 to 65 years were used. To assess physical activity, the long version of the International Physical Activity Questionnaire

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3 Alex Antonio Florindo, "Epidemiology of leisure, transportation, occupational and household physical activity: prevalence and associated factors" *Journal of Physical Activity and Health*, vol.6 (May, 2009), 625-632.
was applied. Multivariate analysis was conducted using a heretical model. **RESULTS:** The greatest prevalence of insufficient activity related to transportation (91.7%), followed by leisure (77.5%), occupational (68.9%), and household settings (56.7%). The variables associated with insufficient levels of physical activity in leisure were female sex, older age, low education level, non-white skin colour, smoking, and self-reported poor health; in occupational settings were female sex, white skin colour, high education level, self-reported poor health, non-smoking, and obesity; in transportation settings were female sex; and in household settings, with male sex, separated, or widowed status and high education level. **CONCLUSION:** Physical activity in transportation and leisure settings should be encouraged. This study will serve as a reference point in monitoring different types of physical activities and implementing public physical activity policies in developing countries.

**Pi-Sunyer X.** reported that obesity is at epidemic proportions in the United States and in other developed and developing countries. The prevalence of obesity is increasing not only in adults, but especially among children and adolescents. In the United States in 2003 to 2004, 17.1% of children and adolescents were overweight, and 32.2% of adults were obese. Obesity is a significant

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risk factor for and contributor to increased morbidity and mortality, most importantly from cardiovascular disease (CVD) and diabetes, but also from cancer and chronic diseases, including osteoarthritis, liver and kidney disease, sleep apnea, and depression. The prevalence of obesity has increased steadily over the past 5 decades, and obesity may have a significant impact on quality adjusted life years. Obesity is also strongly associated with an increased risk of all-cause mortality as well as cardiovascular and cancer mortality. Despite the substantial effects of obesity, weight loss can result in a significant reduction in risk for the majority of these comorbid conditions. Those comorbidities most closely linked to obesity must be identified to increase awareness of potential adverse outcomes. This will allow health care professionals to identify and implement appropriate interventions to reduce patient risk and mortality. A systematic search strategy was used to identify published literature between 1995 and 2008 that reported data from prospective longitudinal studies of obesity and comorbid medical conditions. This article will review evidence for significant associations of obesity with comorbidities to provide information useful for optimal patient management.
Pestana IA\textsuperscript{5}, documented that the condition of "buried" penis may arise from several factors. Although the paediatric form is a rare congenital disorder, it may become an acquired condition in adulthood, most commonly from obesity, radical circumcision, or pen scrotal lymphedema. As obesity has become a national epidemic, the incidence of this phenomenon will inevitably increase. The purpose of this article is to present current strategies in the management of this physically and psychologically debilitating condition. METHODS: A literature review of the surgical management of buried penis was obtained mainly in the plastic surgery and urology literature (PubMed), from 1977 to 2007. RESULTS: Several risk factors were identified in adult patients with buried penis, including morbid obesity and diabetes mellitus. Multiple techniques for release and reconstruction are described, including primary closure, Z-plasty, and skin resurfacing, all of which may or may not include a lumpectomy. Recent publications focus on resurfacing with split-thickness skin grafts and negative-pressure dressings. These techniques have been successful in terms of graft survival and long-term cosmetic result. CONCLUSIONS: Buried penis is an unusual, difficult-to-treat condition that presents a unique challenge to the plastic surgeon and the urologist.

Predisposing factors such as morbid obesity and diabetes mellitus are becoming increasingly prevalent, which suggests a potential increase in the incidence of this condition. Although no specific approach may be applicable to all patients, a combination of various techniques may be applied. In complicated and severe cases, a split-thickness skin graft to the penile shaft, reduction scrotaplasty, suction-assisted lipectomy, and/or surgical lipectomy, such as pannicolectomy, may be indicated. Therapy adapted to the individual patient can result in high rates of successful reconstruction with acceptable cosmetic results.

2.2 STUDIES ON AEROBIC TRAINING

Cadmus L, et.al.⁶ Evaluated the effectiveness of a community based aquatic exercise program for improved quality of life among persons with osteoarthritis. **METHOD:** Two hundred forty-nine adults with osteoarthritis were enrolled in a 20-wk randomized controlled trial of a pre-existing community based aquatic exercise program versus control. Intervention group participants (n = 125) were asked to attend at least two aquatic exercise sessions per week. Control group participants (n = 124) were asked to maintain their usual activity levels. Demographics were collected at baseline,

and patient-reported outcomes were collected at baseline and after 10 and 20 wk. Depressive symptoms, self-efficacy for pain and symptom control, physical impairment, and activity limitation were tested as potential mediators of the relationship between aquatic exercise and perceived quality of life (PQOL). Body mass index (BMI), ethnicity, self-rated health, and comorbidity were tested as possible moderators. **RESULTS:** Aquatic exercise had a positive impact on PQOL scores (P < 0.01). This effect was moderated by BMI (P < 0.05) such that benefits were observed among obese participants (BMI ≥ 30), but not among normal weight or overweight participants. None of the tested variables were found to mediate the relationship between aquatic exercise and PQOL scores. **CONCLUSIONS:** Given the availability of existing community aquatics programs, aquatic exercise offers a therapeutic and pragmatic option to promote quality of life among individuals who are living with both obesity and osteoarthritis. Future investigation is needed to replicate these findings and develop strategies to increase long-term participation in aquatics programs.

**Jones LW**, evaluated cardio respiratory fitness, skeletal muscle function, and body composition of patients with newly

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diagnosed and untreated, postsurgical primary malignant glioma.

METHODS: By using across-sectional design, patients with clinically stable (10 +/- 7 days post-surgery) high-grade glioma (HGG; n = 25) or low-grade glioma (LGG; n = 10) were studied. Participants performed a cardiopulmonary exercise test (CPET) with expired gas analysis to assess cardio respiratory fitness (peak oxygen consumption, VO (2peak)). Other physiological outcomes included skeletal muscle cross-sectional area (CSA; magnetic resonance imaging), isokinetic muscle strength (isokinetic dynamometer), and body composition (air displacement plethysmography). Quality of life was assessed with the Functional Assessment of Cancer Therapy-Brain scale. RESULTS: CPET was a feasible and safe procedure to assess VO(2peak), with no serious adverse events. VO(2peak) indexed to total body weight and lean body mass (LBM) for both groups was 13.0 mL . Weight. Min (-1) and 19 mL.LBM .min (-1), the equivalent to 59% and 38% below age- and sex-predicted normative values, respectively. Skeletal muscle strength and mid-thigh CSA were lower in HGG relative to LGG patients (83 vs 125 Nm, P = .025; 94 vs 119 cm (2), P = .171, respectively). Skeletal muscle isokinetic strength, CSA, and body composition outcomes predicted VO (2peak) (r = -0.59 to 0.68, P < .05). CONCLUSIONS: Postsurgical glioma patients have markedly reduced cardio respiratory fitness, isokinetic strength, and CSA.
Prospective studies are now required to determine whether such abnormalities influence treatment toxicity and clinical outcome as well as to test the effect of appropriately selected interventions to prevent and/or mitigate dysfunction.

Molenaar EA, compared the effects of nutritional counselling with nutritional plus exercise counselling on body weight and waist circumference in overweight adults in a multidisciplinary primary care setting. METHODS: One hundred and thirty-four overweight adults (body mass index 28-35) were randomly assigned to individual counselling sessions by a dietician (D) or counselling sessions by a dietician plus physiotherapist (D + E) during 6 months with one follow-up session at 12 months. Outcomes were assessed at baseline, 6 and 12 months. Difference in changes of outcome measures between groups were analysed using generalized estimating equations. RESULTS: Weight reduced from baseline to 6 months in D [-2.2 ( -3.1 to -1.4) kg] and D + E [- 3.0 ( - 4.0 to -2.0) kg] and was sustained at 12 months [-2.0(-3.1 to -1.4) kg and -3.1 (- 4.5 to -1.6) kg, respectively]. The reduction in weight did not significantly differ between D and D + E (P = 0.48). In both groups, waist circumference decreased from baseline to 6 months [-2.1 (-3.3to -0.8) cm for D; -3.7 (-5.1 to -2.3) cm for D + E] and was

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8Esther A. Molenaar ,“Effect of nutritional counselling and nutritional plus exercise counselling in overweight adults : a randomized trial in multidisciplinary primary care practice”, Family Practice, (December, 2010), P.21-22
sustained at 12 months [-2.1 (-3.5 to -0.7) cm and -4.2 (-6.0 to - 2.5) cm, respectively]. Participants in D + E tended to decrease their waist circumference more than those in D (P = 0.14).

**Discussion:** Nutritional counselling by a dietician resulted in modest reductions in weight and waist circumference in overweight adults, which were sustained up to 12 months. Adding exercise counselling by a physiotherapist did not significantly enhance the effect on body weight. Exercise counselling may, however, further improve waist circumference.

Goulopoulou S.\(^9\) examined the effect of aerobic exercise training on vagal and sympathetic influences on the modulations of heart rate and systolic blood pressure in response to an oral glucose load in obese individuals with and without type 2 diabetes mellitus (T2D). Beat-to-beat arterial pressure and continuous electrocardiogram were measured after a 12-hour overnight fast and in response to glucose ingestion (75 g dextrose) in obese subjects with (T2D group, n = 23) and without (OB group, n = 36) T2D before and after 16 weeks of aerobic exercise training at moderate intensity. Autonomic modulation was assessed using spectral analysis of systolic blood pressure variability (BPV), heart rate variability

(HRV), and analysis of bar reflex sensitivity (BRS). Glucose ingestion significantly increased low-frequency (LF (SBP)), low frequency HRV (LF (RRI)), and the ratio of low- to high-frequency components of HRV (LF (RRI)/HF (RRI)), and decreased the high-frequency power (HF (RRI)) (P < .05). Exercise training increased LF(RRI) and LF(RRI)/ HF(RRI) responses, and reduced HF(RRI) and LF(SBP) to glucose ingestion in both groups (P < .05), but increased fasted BRS in the OB group only (P <.05); glucose intake had no effect on BRS (P > .05). In conclusion, a 16-week exercise training program improved cardiac autonomic modulation in response to an oral glucose load in obese adults, independently of diabetes status, and in the absence of remarkable changes in body weight, body composition, fitness level, and glycaemic control. Copyright © 2010 Elsevier Inc. All rights reserved.

Kemp JP.\textsuperscript{10} reported that exercise-induced broncho constriction (EIB) is very common in both patients with asthma and those who are otherwise thought to be normal. The intensity of exercise as well as the type of exercise is important in producing symptoms. This may make some types of exercise such as swimming more suitable and extended running more difficult for

patients with this condition. A better understanding of EIB will allow the physician to direct the patient towards a type of exercise and medications that can result in a more active lifestyle without the same concern for resulting symptoms. This is especially important for schoolchildren who are usually enrolled in physical education classes and elite athletes who may desire to participate in competitive sports. Fortunately several medications (short- and long-acting beta (2)-agonists, cromolyn, nedocromil, inhaled corticosteroids, and more recently leukotriene modifiers) have been shown to be effective in preventing or attenuating the effects of exercise in many patients. In addition, inhaled beta (2)-agonists have been shown to quickly reverse the airway obstruction that develops in patients and continue to be the reliever medications of choice. Inhaled corticosteroids are increasingly being recommended as regular therapy now that the role of inflammation and airway injury has been identified in EIB. With the discovery that there is a release of mediators such as histamine and leukotrienes from cells in the airway following exercise with resulting airway obstruction in susceptible individuals, interest has turned to attenuating their effects with mediator antagonists especially those that block the effects of leukotrienes. Studies with an oral leukotriene antagonist, montelukast, have shown beneficial effects in adults and children aged as young as 6 years with EIB. These effects can be
demonstrated as soon as two hours and as long as 24 hours after administration without a demonstrated loss of a protective effect after months of treatment. The studies leading up to and resulting in an approval of montelukast for EIB for patients aged 15 years and older are reviewed in this paper.

Dobrosielski DA11, reported that Nitric oxide (NO) may play a critical role in facilitating the delivery of blood to active skeletal muscle, ultimately impacting functional health in older adults. Plasma nitrite is a useful marker of vascular NO bioavailability. The aim of the current investigation was to examine the effect of a widely used physical function test on plasma nitrite concentrations in older adults. **Methods:** Venous blood was drawn before, immediately following, and 10 minutes following the completion of a 400-m walk test. Blood samples were added to heparin and frozen for subsequent analysis of nitrite levels using chemiluminescence. **Results:** Twenty-six (79 +/- 4 years) women participated in this study. Plasma nitrite levels decreased approximately 22% from baseline following a 400-m walk. Percent change in plasma nitrite was related to walking speed (r=-.550, p=0.004). **Conclusions:** These data suggest an alteration in plasma nitrite concentration following a functional test which may impact functional health.

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2.3 STUDIES ON FITNESS VARIABLES

Viski, et.al. analyzed the impact of special programmed physical education including dance, aerobics and rhythmic gymnastics on the development of motor and functional abilities and morphological characteristics of female fourth-grade high-schoolers in Zagreb. A total sample of 220 high schoolers aged 16-18 years were divided into two groups: experimental group of 115 students attending the program composed of dance structures and aerobics, and control group of 105 students attending classic program of physical education. A set of 3 morphological variables, 6 motor variables and one functional variable were applied in both groups on three occasions during an academic year (initial, transient and final measurements). Two-factor analysis of variance (MANOVA repeated measure design) showed the experimental program to significantly influence the development of coordination/agility and specific rhythm coordination, functional aerobic ability, repetitive and explosive strength and flexibility, along with significant reduction of overweight and adipose tissue. Study results clearly indicate that the existing programs of physical education should be revised and replaced by more appropriate ones.

Lee, Yi and Kim. Studied the comparison of the effects of an exercise program in non-obese and obese women. The purpose of this study was to compare the effects of an exercise program on physical fitness, obesity indices, and blood lipids in cases of non-obese and obese women. Data was collected from May, 2006 to November, 2006 in a public health center. All Subjects (37 women) participated in an exercise program that consisted of Latin dance, muscular strength training, and dumbbell exercises. Thirty-seven women were divided into two groups (16 non-obese women and 21 obese women) by %body fat. After 8 weeks, the effects of treatment were compared between pre-test and post-test in each group. Physical fitness (abdominal muscle strength, muscle endurance, flexibility, agility, balance) was significantly different between the pre-test and post-test in the non-obese and obese group. Obesity indices (body weight, BMI) was significantly different in obese women after the 8-week exercise program. There was no decrease of blood lipids in either group. These findings indicate that an exercise program could be an effective nursing intervention to increase physical fitness in non-obese and obese women and to decrease obesity indices (body weight, BMI) in obese women.

Tsourlou, et.al. Examined the effectiveness of a 24-week aquatic training (AT) program, which included both aerobic and resistance components, on muscle strength (isometric and dynamic), flexibility, and functional mobility in healthy women over 60 years of age. Twenty-two subjects were assigned randomly to either an AT (n = 12) or a control (C, n = 10) group. Volunteers participated in a supervised shallow-water exercise program for 60 minutes a day, 3 days a week; the exercise program consisted of a 10-minute warm-up and stretching, 25 minutes of endurance-type exercise (dancing) at 80% of heart rate (HR)(max), 20 minutes of upper- and lower- body resistance exercises with specialized water-resistance equipment, and a 5-minute cool down. Maximal isometric torque of knee extensors (KEXT) and knee flexors (KFLEX) were evaluated by a Cybex Norm dynamometer, grip strength (HGR) was evaluated using a Jamar hydraulic dynamometer, and dynamic strength was evaluated via the 3 repetition maximum (3RM) test for chest press, knee extension, lag pull down, and leg press. Jumping performance was evaluated using the squat jump (SJ), functional mobility with the timed up-and-go (TUG) test, and trunk flexion with the sit-and-reach test. Body composition was measured using the bioelectrical impedance method. The AT induced significant

improvements in KEXT (10.5%) and KFLEX (13.4%) peak torque, HGR strength (13%), 3RM (25.7-29.4%), SJ (24.6%), sit-and-reach (11.6%), and TUG (19.8%) performance. The AT group demonstrated a significant increase in lean body mass (3.4%). No significant changes in these variables were observed in the C group. The results indicate that AT, with both aerobic and resistance components, is an alternative training method for improving neuromuscular and functional fitness performance in healthy elderly women.

Mahrova, Bunc and Fischerova\textsuperscript{15} conducted the Motor skills testing in patients with chronic renal failure. The aim of our study was to choose an acceptable motor test battery, which should target such components of motor performance, who’s certain rate is necessary for self-sufficiency keeping and perform activities of daily living. He observed mixed group of 23 patients. For evaluation of the functional condition we used the "Senior Fitness Test Manual"\textsuperscript{(8)}, which measures these physical attributes: muscle strength, physical endurance, flexibility, agility and balance. The input results we compared with population standard specification used in the test

battery. Results of the tests showed that the group of patients in comparison with the population standard specification have reached subnormal and risk performances, especially in tests requiring for its implementation muscular strength of lower extremities and physical efficiency. Normal and above normal performances we observed in patients that were physically active before and during regular dialysis treatment. After the evaluation of result, we considered the selected battery of motor tests as an acceptable choice for motor skills testing in renal dialyzed patients all age categories.

Gappmaier, et. al,\textsuperscript{16} examined the aerobic exercise in water versus walking on land. Effects on indices of fat reduction and weight loss of obese women. To test this hypothesis 38 middle-aged obese women (25-47\% body fat) participated in a 13 week exercise-diet program to compare the effects of aerobic exercise in water versus walking on land on indices of fat reduction and weight loss changes. Subjects were randomly assigned to 1 of 3 exercise groups: 1) walking on land (WL), 2) swimming (SW) at 27 degrees C water temperature and 3) walking in 29 degrees C water (WW) at the shallow end of a declining pool with the water at navel height. Subjects in the SW group alternated breast-, side-, and backstroke swimming without face immersion. Exercise parameters

were kept constant for all three groups. Subjects participated in supervised exercise sessions for 40 min, 4 times a week at 70% of age-predicted maximum heart rate. Subjects were tested before and after the 13-week experimental period. Significant reductions in body weight, (5.9 kg), percent body fat, (3.7%), and skin fold and girth measurements, occurred in all groups. There were no significant differences between groups. The results of this study indicate that there are no differences in the effect of aerobic activities in the water versus weight-bearing aerobic exercise on land on body composition components as long as similar intensity, duration and frequency are used.

Burgess, Grogan and Burwitz\textsuperscript{17} investigated the effects of 6-week aerobic dance on these variables with 50 British schoolgirls aged 13-14 years. A cross-over design was used with two equivalent groups taught normal physical education and aerobic dance in a different order. The Body Attitude Questionnaire (BAQ) and Children and Youth Physical Self-Perception Profile (CY-PSPP) were administered as pre, mid and post-test to each participant in each group before the first intervention, at the changeover and after 12 weeks. The results of this study revealed that participation in 6 weeks of aerobic dance significantly reduced

\textsuperscript{17}Gillian Burgess, Sarah Grogan, Lee Burwitz, “Effects of a 6 week aerobic dance intervention on body image and physical self-perceptions in adolescent girls”, \textit{Body Image}, Vol-3, Issue-1, (March, 2006), P: 57-66
body image dissatisfaction (Attractiveness, Feeling Fat, Salience and Strength and Fitness) and enhanced physical self-perceptions (Body Attractiveness and Physical Self-Worth), although these improvements were not sustained.

2.4 STUDIES ON PHYSIOLOGICAL VARIABLES

Zaros PR, et.al.\textsuperscript{18} Investigated the effects of 6 months of dynamic exercise training (ET) on blood pressure and plasma nitrate/nitrite concentration (NOx-) in hypertensive postmenopausal women. Eleven volunteers were submitted to the ET consisting in 3 days a week, each session of 60 minutes during 6 months at moderate intensity (50% of heart rate reserve). Anthropometric parameters, blood pressure, NOx- concentration were measured at initial time and after ET. A significant reduction in both systolic and diastolic blood pressure values was seen after ET which was accompanied by markedly increase of NOx- levels (basal: 10 +/- 0.9; ET: 16 +/- 2 micro M). Total cholesterol was significantly reduced (basal: 220 +/- 38 and ET: 178 +/- 22 mg/dl), whereas triglycerides levels were not modified after ET (basal: 141 +/- 89 and ET: 147 +/- 8 mg/dl). The study shows that changing in lifestyle promotes reduction of arterial pressure which was accompanied by increase in nitrite/nitrate concentration. Therefore, 6-months of

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\textsuperscript{18}P. R. Zaros, et. al., “Effect of 6 months of physical exercise on the nitrate/nitrite levels in hyper sensitive postmenopausal women”, \textit{Bio Med Central Women’s Health}, (19, June 2009), P: 17
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exercise training are an important approach in management arterial hypertension and play a protective effect in postmenopausal women.  

**Giuseppe Cicero .AF, et.al.** Evaluated the short-term cardio metabolic effect of a sequential physical activity programme on pharmacologically untreated hypertensive overweight women and on age matched men. The study enrolled 80 overweight patients with newly diagnosed hypertension, not treated with antihypertensive nor anti hyper lipidaemia drugs or under stabilized treatment. After 3 months of AHA Step 2 diet, they followed a sequential training programme including 56 days of added 3 metabolic equivalents (METs)/week and 56 days of 6 METs/week. Dietary habits, anthropometric measurements, blood pressure measurement, insulin-resistance profile and plasma lipids were monitored. All experienced a significant decrease in body mass index, waist circumference and blood pressure after both training, but only women experienced an improvement in diastolic blood pressure at the end of the intensive training phase. However, when considering the single pre specified subgroups, only women experienced a significant increase in high density lipoprotein cholesterol (HDL-C). Older women without metabolic syndrome (MS) and older men with MS experienced a decrease of HDL-

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**Arrigo Francesco Cicera Giuseppe et. al., “Gender Specific haemodynamic and metabolic effects of a sequential training programme on overweight obese hypertensives”, Blood Presser, Vol-18, Issue-3,(Aug., 2009),P: 1-6**
C following moderate intensity exercise and an increase after intensive exercise. While all patient subgroups experienced a significant reduction in homeostasis model assessment (HOMA) index only after the intensive exercise phase when compared with the baseline, women differently experienced a significant improvement in HOMA index just after the moderate exercise phase and a further improvement after the intensive one. On the basis of the data, it seems that the metabolic and haemodynamic answer of women to physical activity is particularly effective and different compared with men.

Volpe SL, et.al. investigated the effect of diet alone (D), exercise alone (E), and a combination of diet and exercise (DE) on body weight, body composition, energy intake, blood pressure, serum lipid and leptin levels, and fitness levels in mildly obese sedentary women and men. The three interventions were compared in a randomized longitudinal study design. The exercise programs were supervised for six months, after which participants in E and DE were provided with exercise equipment to take home. 90 adult overweight women and men (age: 44.2 +/- 7.2 years; BMI = 30.5 +/- 2.7 kg/m²). Body weight, body composition, waist and hip circumferences, blood pressure, serum lipid levels, and fitness levels

were evaluated at 0, 3, 6, 9, and 12 months. Serum leptin concentrations were measured at 0 and 6 months only. At 6 and 9 months in women, and 9 months in men, DE demonstrated a significant loss of body weight compared to both D and E (p < 0.05). Serum leptin levels significantly decreased from baseline to 6 months in women in D (p = 0.05) and DE (p = 0.0003) and men in E (p = 0.038). At one year, no significant differences existed among groups in any of the measures. A combination of diet and exercise resulted in a significant decrease in body weight in women and men; but this decrease was not maintained at one year follow-up. Serum leptin concentrations showed significant within-group decreases, but were not different among groups. A supervised diet and exercise program is effective for weight loss; however, once intensive participant-investigator and participant-participant contact is discontinued, weight regain ensures.

Savvas et. al.\textsuperscript{21} Investigated the adaptations of a water-based training program as well as the detraining and retraining effects on physiological parameters in patients with coronary artery disease (CAD). Methods: Twenty-one patients were separated in an exercise group (n = 11) and a control group (n = 10). The exercise group followed three periods: training, detraining and retraining.

Each period lasted 4 months. During the training and the retraining periods, the patients performed four sessions of water exercise (not swimming) per week. Results: The water-based program was well-accepted and no adverse effects were observed. The exercise group improved ($p < 0.05$) their stress-test time (+11.8%), VO2 peak (+8.4%) and total body strength (+12.2%) after the training period; detraining tended to reverse these positive adaptations. Resumption of training increased the beneficial effects obtained after the initial training period (exercise stress: +4.5%; VO2 peak: +6.6%; total strength: +7.0%). The patients in the control group did not show any significant alterations throughout the study. Conclusion: Water-based exercise is safe and induces positive physiological and muscular adaptations in low-risk patients with CAD.

**Starker, et.al.** investigated the Motor Fitness Results of the German Health Interview and Examination Survey for Children and Adolescents (KIGGS). Motor fitness was investigated in children and adolescents aged 4–17 using specific short tests. These tested the motor abilities: co-ordination, strength, cardio respiratory fitness and flexibility. Among the 4-10 year olds, the focus of the investigation was on recording coordination, strength and flexibility; in the age group of the 11-17 year olds it was on recording cardio

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22A. Starker, et al., “Motor Fitness Results of the German Health Interview and Examination Survey for children and adolescents (KiGGS)-Europe PMC, Vol-50, Issue-34, (May-June, 2007), P: 775-783
respiratory fitness. The current investigation describes motor fitness based on the tested abilities according to age, sex and socio-demographic aspects. In all the test tasks, as expected, there are better results from older children and adolescents than from younger ones. Among the 4-10 year olds, girls display a slightly higher motor fitness in five out of the six tasks. In cardio respiratory fitness, the cycle ergometer test for the 11-17 year olds shows better results for boys. The results indicate that there is a correlation between migrant status, social status and motor fitness. The shown differences point out that possible intervention programmes should be specifically attuned to age and sex as well as to the concerns of children and families with a migrant background and those of low social status. These collected data on motor fitness produced a database, representative of Germany. This will enable statements on state and development of motor fitness in children and adolescents in the future.

Senthil kumar conducted a study on effect of varied aerobic training program on obese women working in IT companies for the purpose of the study aerobic refers to a variety of exercise that stimulate heart and lung activity for a time period sufficiently long

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to produce beneficial changes in the body (Cooper, 1970). Aerobic is a system of exercises designed to promote the supply and use of oxygen in the body. In this study, the investigator is interested to carry out the experiment on two randomized groups of obese women working in IT companies and their effects on cardio respiratory functions. For this study, the obese women were grouped into three namely, control, floor aerobic and step aerobic group. The collected data on the cardio respiratory parameters prior to and after 12 weeks of varied aerobics training were statistically analyzed using Analysis of covariance (ANCOVA) as recommended by Clarke and Clarke (1972) Best and Khan (1986). And result on vital capacity showed significant improvement due to varied aerobic exercises, whereas no significant improvement in resting heart rate.

A. K. Vaidya, et.al. 24 Studied the burden of obesity and its association with physical activity was carried out in a rapidly urbanizing town. A cross sectional study to investigate the prevalence of obesity and its association with physical activity was carried out in one thousand adult males of Dharan municipality. Tools of data collection included interview and physical measurements such as blood pressure, height and weight measurements, and waist and hip circumferences. Odds ratios (ORs)

and their 95% confidence intervals for obesity were computed across various demographic and other variables without adjusting and then adjusting for physical activity. The prevalence of overweight and obesity in the population was 32.9% and 7.2% respectively. The study showed that physical inactivity is more importantly associated with obesity in the older population. The trend of young being more obese is reversed after adjusting for physical activity so that those in the older age were more obese than the younger ones. Similarly, those in to the business, vocational and clerical works, those who were more literate and those in the higher socio-economic status were significantly associated with obesity even after correcting for physical activity. The prevalence of overweight and obesity is high in the males of Dharan. The value and effect of physical activity seem to vary across different age-groups and socio-economic status and occupations. The young, the technical persons or businessmen and the more prosperous ones probably need to bring down their calorie intake along with emphasis on physical activity in order to bring down their weight and cardiovascular risk.
2.5 STUDIES ON BIOCHEMICAL VARIABLES

Taralov et al.\textsuperscript{25}, found that the physical activity had a beneficial effect on the serum lipid profile in adolescent and mature human. For this study 876 highly trained athletes (559 boys and 317 girls) with their mean age, weight and duration of training, 14.01 years, 56.24 kg, and 3.52 years respectively were used. The control group consisted of 357 untrained subjects (171 boys and 186 girls) with mean age and weight 14.58 years and 57.75 kg, respectively. The athletes were divided into seven subgroups according to the sport practiced with 105 athletes, 107 swimmers, 233 rowers and 225 wrestlers, boxers and judos, 47 weight lifters, 92 from members of various team sports and 67 from other sports. Venous blood samples were drawn from the cubital vein and the concentrations of serum total cholesterol, HDL-cholesterol and triglycerides were measured. The results of the study indicated that a) trained pubescents had lower serum total cholesterol than untrained boys and girls of the same age; b) trained pubescent boys had lower serum total cholesterol than trained pubescent girls; c) the level of serum triglycerides was not relevant to the type of physical exercise in pubescence; d) long-term sport practicing was not able to decrease serum HDL - cholesterol levels in both sexes; e) sport

affected serum total cholesterol to a greater degree than sex in pubescence.

Kristiansen et al.\textsuperscript{26} subjected eight untrained subjects to endurance training with one thigh for three weeks using a knee-extensor ergometer. They were then subjected to two-legged glycogen depleting exercise and were given carbohydrate free meal thereafter to keep muscle glycogen concentration low. The next morning, dynamic knee extensions with both the thighs simultaneously at 60, 80 and until exhaustion at 100 per cent of each thigh peak workload was performed. Glucose uptake was similar in both thighs during exercise at 60 per cent of the thigh peak workload. At the end of 80 and 100 percent of peak work load, glucose uptake was on an average 33 and 22 percent higher, respectively, in trained compared with untrained muscle. Training increased the muscle content of glucose transporters (GLUT- 4) by 66 per cent. At exhaustion, glucose extraction correlated significantly with total muscle GLUT- 4 protein. Thus, when working at a high load with low glycogen concentrations, muscle glucose uptake was significantly higher in trained than in untrained muscle. This may be due to the higher GLUT- 4 protein concentration in trained muscle.

\textsuperscript{26}Soren Kristiansen, et.al, “Glucose up- take is increased in trained vs untrained muscle during heavy exercise”, Journal of applied physiology, Vol-89, Issue-3 (September, 2000), P:1151-1158.
Katzel et al., documented the sequential effects of aerobic exercise training and weight loss on risk factors for coronary disease in healthy, obese, middle aged men and older men. The effects of sequential interventions of 9 month of aerobic exercise training (AEX) followed by weight loss (WL) with continued AEX (AEX+WL) in cardiac risk factors in 21 obese middle aged and older men were examined. The results indicated that AEX increases VO2 max of these men by 14% (p<0.001) with no significant change in weight. Also AEX did not improve BP or oral glucose tolerance and had no significant effect on lipid concentrations. During the AEX + WL intervention, 21 men lost 8.1 + 0.6 kg compared with AEX, AEX + WL group decreased glucose and insulin responses during the oral glucose tolerance test by 8% (p<0.05) and 30% (p<0.01) respectively. AEX + WL reduced plasma triglycerides by 17% (p<0.05) and LDL-C by 8% (p<0.01) and increases HDL-C by 11% (p<0.01). The sequential interventions resulted in a 20% decreased in the LDL-C /HDL-C ratio. The results denoted that AEX + WL had a more substantial impact than AEX alone on glucose tolerance and lipoprotein concentrations.

Mahmoud S. El-Sayed and Angel heart J. M. Rattu, studied the effect of prolonged sub maximal exercise followed by a self-paced maximal performance test on total cholesterol, triglycerides and high density lipoprotein cholesterol in nine trained athletes. Venous blood samples were obtained at rest, at 30 and 60 minutes during sub maximal exercise and immediately after the performance test. Lactic acid, Haematocrit (Hct), Haemoglobin (Hb), total cholesterol and triglycerides were measured in the blood, while plasma was assayed for HDL-cholesterol. Plasma volume changes in response to exercise were calculated from Hct and Hb values and all lipid measurements were corrected accordingly. In order to ascertain the repeatability of lipid responses to exercise, all subjects were re-tested under identical testing conditions and experimental protocols. The data obtained during the two exercise trials were analysed by two-way ANOVA and no significant differences between tests were obtained. Consequently, the data was analysed by one-way ANOVA. Blood lactic acid increased non significant during the prolonged sub maximal test, but rose markedly following the performance ride. Lipid variables ascertained at rest were within the normal range for healthy subjects. ANOVA showed that blood total cholesterol and triglycerides were

unchanged whereas HDL-cholesterol rose significantly in response to exercise. Post hoc analysis indicated that the latter change was due to a significant rise in HDL cholesterol after the performance ride. It was concluded that apparent favourable changes in lipid profile variables occur in response to prolonged sub maximal exercise followed by maximal effort and these changes showed a good level of agreement over the two testing occasions.

Giada et al. studied the lipoprotein profile, diet and body composition in twenty professional soccer players (mixed trained), twenty body builders (anaerobic trained) and twenty sedentary subjects, all males of similar age. No significant differences in total serum cholesterol, triglycerides, HDL - cholesterol, LDL - cholesterol, apo lipoprotein A-I, A-II, B, C-II, C-III, and E levels were found among the groups studied. Bioelectrical impedance analysis disclosed significantly lower body fat percentages in both groups of athletes and increased fat free mass only in body builders. Daily calorie intake was higher and alcohol intake was lower in the athletes, compared with controls. Body builders had lower carbohydrate and higher protein and cholesterol intakes, while soccer players had a lower polyunsaturated to saturated fat ratio. None of the apo lipoproteins examined was correlated with any body

composition of diet parameters. No correlations between lipid parameters and anthropometric or dietary variables were found by multivariate analysis when the subjects were considered as a whole.

Tegeiman et al.\textsuperscript{30} reported that the physical training affects carbohydrate metabolism and resulted in an increased insulin-stimulated glucose disposal. The present study was conducted to investigate whether carbohydrate and lipid metabolism would be affected by nutritional factors in optimally trained elite ice-hockey players on two Swedish top-performance teams. Players on one team were subjected to extensive dietary monitoring and intervention, whereas players on the second team continued their ordinary diet. Blood levels of insulin, C-peptide, glucose, haemoglobinA1C, lipids and lipoproteins were measured repeatedly. Basal insulin levels and insulin resistance were significantly lower among athletes on both the teams compared with a sedentary group and muscle weight and body mass index were significantly higher. Exercise increases glucose utilization by muscle, depending upon the mode, intensity and duration of the exercise. Exercise would also increase insulin sensitivity of the tissues, thereby increasing glucose uptake and utilization.

\textsuperscript{30}Ragnar Tegriman, et.al, “Influence of a Diet Region on Glucose Homeostasis and Serum Lipid Level of Make Elite Athletes”, \textit{Metabolism}, Vol-45, Issue-4 (April,1996), P: 435-441
Giada et al., examined 12 older and 12 young adult male cyclists first at the peak of their seasonal preparation and then again two months after its suspension. Sedentary males matched for age, weight and height comprised the respective control groups. During training, the body fat mass was significantly lower and maximum oxygen consumption (Vo2 max) was higher in both groups of cyclists as compared with controls. No differences in serum total cholesterol, low density lipoprotein cholesterol, apo lipoprotein (apo) B, apo A-II, and fibrinogen were found. During the same phase, triglycerides and LDL-cholesterol to high density lipoprotein cholesterol ratio were significantly lower and apo A-1, HDL-cholesterol, HDL-3-cholestrol and the apo A1/apo B ratio were significantly higher in the athletes than their corresponding sedentary controls.

2.6 STUDIES ON PSYCHOLOGICAL VARIABLES

Van der Gucht E, et.al., Examined depress genic psychological processes and reward responsively in relation to different mood episodes (mania, depression, remission) and bipolar symptomatology. One hundred and seven individuals with bipolar disorder (34 in a manic/hypomanic or mixed affective state; 30 in a


depressed state and 43 who were euthymic) and 41 healthy controls were interviewed with Structured Clinical Interview for DSM-IV and completed a battery of self-rated and experimental measures assessing negative cognitive styles, coping response to negative affect, self-esteem stability and reward responsiveness. Individuals in all episodes differed from controls on most depression-related and reward responsively measures. However, co-relational analyses revealed clear relationships between negative cognitive styles and depressive symptoms, and reward responsively and manic symptoms. Separate psychological processes are implicated in depression and mania, but cognitive vulnerability to depression is evident even in patients who are euthymic.

Mullen R, Lane A, and Hanton S. examined the intensity and direction of the competitive state anxiety response in collegiate athletes as a function of four different coping styles: high anxious, defensive high-anxious, low-anxious and repressors. Specifically, the study predicted that repressors would interpret competitive state anxiety symptoms as more facilitative compared to high-anxious, defensive high-anxious, and low-anxious performers. Separate MultivariateAnalyses of Variance (MANOVA) were performed on the intensity and direction subscales of the modified Competitive

State Anxiety Inventory-2 (CSAI-2). A significant main effect was identified for trait worry revealing that low trait anxious athletes reported lower intensities of cognitive and somatic anxiety and higher self-confidence and interpreted these as more facilitative than high trait anxious athletes. The prediction that performers with a repressive coping style would interpret state anxiety symptoms as more facilitative than performers with non-repressive coping styles was not supported.

**Edwards B, and Higgins D. J.** Compare the mental health and vitality of people caring for a family member with a disability with those of the general population. Second, to identify factors experienced by careers that put them at risk of poor mental health and vitality. Cross-sectional design where logistic and multiple regression analyses were used to compare rates of mental health problems and vitality between careers and the general population while controlling for demographic characteristics. In addition, logistic and multiple regression using data from the survey of careers were used to identify risk factors for poor mental health and vitality that were particular to care giving. A randomly selected representative survey of 1002 careers from the Australian Centre

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link administrative database (June 2006) who received government payments to care for a person with a disability or severe medical condition, or a person who was frail aged. A sample of 10 223 non-careers was drawn from the fourth wave of the Household, Income and Labour Dynamics in Australia Survey, a nationally representative household panel survey (August 2004 to February 2005). Mental health and vitality as measured by the Medical Outcomes Study 36-item Short-Form Health Survey. Compared with the general population, careers were at significantly greater risk of having a mental health problem and lower levels of vitality, even after controlling for demographic characteristics. For careers, the risk factors for poor mental health and lower levels of vitality were caring for a person with a disability with higher care needs, experiencing greater levels of financial stress, lower levels of support and worse family functioning. Careers are at greater risk of mental health problems and lower energy levels than the general population.

**Barnow S, et. al.**\(^35\) reported that the cognitive theory of personality disorders hypothesizes that the emotional dysregulation and interpersonal problems in individuals with borderline personality disorder (BPD) are, at least partially, caused by

dysfunctional cognitive schemas. These schemas lead to biased evaluation of environmental and interpersonal stimuli. This study examined the interpersonal evaluations of individuals with BPD, depressive and healthy control participants with the thin-slice judgment paradigm. Participants were asked to evaluate six persons in six film clips, which showed these persons for 10s, during which these persons entered a room and took a seat. Interpersonal style of the BPD group was investigated with the Inventory of Interpersonal Problems (IIP-C) questionnaire. Individuals with BPD judged the persons as being more negative and aggressive and less positive than the healthy participants, and more aggressive than the depressive individuals. In addition, individuals with BPD reported more extreme interpersonal behavior relative to the controls. The findings indicate an aggressivistic evaluation bias and elevated levels of interpersonal problems in individuals with BPD as suggested in the cognitive theory.


model, young adolescents with initial depressive symptoms were hypothesized to experience later stressors that were at least partly dependent on their behavior. The interaction of cognitive vulnerability, a tendency to make depressogenic attributions and to ruminate, with these dependent stressors was then hypothesised to predict depressive symptoms after 6 months. This model was supported in a sample of 756 young adolescents, with cognitive style and dependent stressors partly mediating the relationship between initial and subsequent depressive symptoms. Cognitive vulnerability was also linked with an increased likelihood of dependent stressors.

Stine-Morrow EA, et.al. studied on cognitive training have suggested that the effects of experience are narrow in augmenting or maintaining cognitive abilities, while co-relational studies report a wide range of benefits of an engaged lifestyle, including increased longevity, resistance to dementia, and enhanced cognitive flexibility. The latter class of evidence is ambiguous because it is possible that it is simply the case that those with relatively better cognitive vitality seek out and maintain a wider range of activities. The authors report data from a field experiment in which older adults were randomly assigned to participate in a program intended to operationalize an engaged lifestyle, built on a team-based

competition in ill-defined problem solving. Relative to controls, experimental participants showed positive change in a composite measure of fluid ability from pre-test to post-test. This study, thus, provides experimental evidence for the proposition that engagement, in the absence of specific ability training, can mitigate age-related cognitive declines in fluid ability.

Von Guenthner S, and Hammermeister J. explored the relationship between wellness and athletic performance, this study assessed the link between wellness, as defined by a high score on five wellness dimensions of emotional, social, spiritual, intellectual, and physical well-being, with psychological variables thought to be related to athletic performance as measured by athletes' self-report of specific athletic coping skills. 142 collegiate athletes completed a survey composed of the Optimal Living Profile to measure wellness dimensions and the Athletic Coping Skills Inventory to measure specific psychological variables. Analysis indicated that athletes scoring higher on the dimensions of wellness also scored significantly higher on athletic coping skills. Specifically, male athletes who scored higher on wellness also reported higher scores on coach ability, concentration, goal setting/mental preparation, and peaking under pressure, and female athletes who scored higher on wellness also reported higher scores

in coping with adversity, coach ability, concentration, goal setting/mental preparation, and freedom from worry. Various dimensions of wellness seem related to better performance by involving the athletic coping skills of intercollegiate athletes. Implications for coaches and sport psychologists are also discussed.

Berger and Motl. Conducted a study on recent 25 years reviews of related research literature to the effect of exercise on Profile of Mood States (POMS). They concluded that there is unequivocal support for the mood enhancing effects of exercise, specifically on improved vigour and reduced tension, depression, anger, confusion and fatigue. With respect to exercise intensity, the authors recommend that unless a participant prefers low or high exercise intensity, optimal conditions for mood changes occur at a moderate intensity level. In summary, exercise, in particular moderate intensity aerobic exercise, reduced negative mood and improved positive mood state.

From the review of related literature it was found there was scope for research in finding out the effect of varied aerobics exercises on selected physical, physiological biochemical and psychological variables among the obese engineering college students. Based on the experience gained, the investigator formulated suitable methodology to be adapted in this research, which is presented in Chapter III.

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