# Encyclopedia of Sports and Athletics

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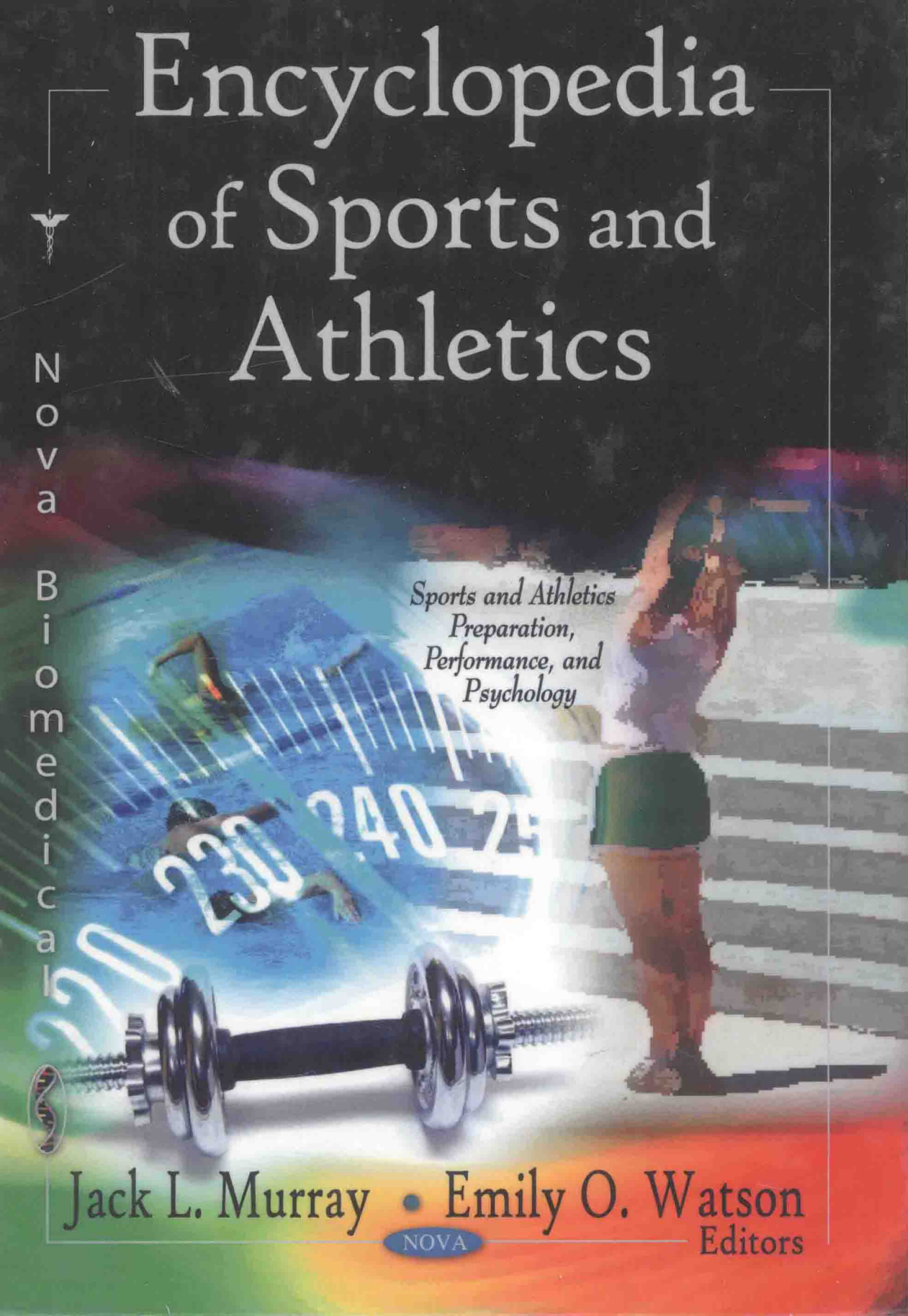

*Sports and Athletics*
*Preparation, Performance, and Psychology*

Jack L. Murray • Emily O. Watson
Editors

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SPORTS AND ATHLETICS PREPARATION, PERFORMANCE, AND PSYCHOLOGY SERIES

# ENCYCLOPEDIA OF SPORTS AND ATHLETICS

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AND
EMILY O. WATSON
EDITORS



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# Preface

This new book presents and discusses current research in the study of sports and athletics. Topics discussed include the anti-inflammatory effects of exercise; the role of physical exercise in Parkinson's disease; the health benefits of aerobic activity and physical fitness in young people; physiological evaluation of athletic performance in cyclic sports; social and environmental influences on athlete motivation in sports; self-talk in sports; mental toughness; the role of physical activity in the treatment and prevention of anxiety and depression in children and being superstitious in sports

Chapter I - "Currently, modern chronic diseases are the leading killers in Westernized society and are increasing rampantly in developing nations. Considerable knowledge has accumulated in recent decades showing that physical exercise can be a very effective non-pharmacological strategy in the treatment of these pathologies, and as a result, several types of physical exercise are recommended in this matter. Aerobic exercise has been recognized as a safe and beneficial physical training modality for a number of chronic conditions, yet physicians do not know how to prescribe it. This chapter aims to discuss the effects of aerobic exercise in the treatment of metabolic syndrome-related disorders (diabetes, hypertension and obesity), heart and pulmonary diseases (coronary heart disease, chronic obstructive pulmonary disease and asthma), locomotive apparatus disorders (rheumatoid arthritis, osteoporosis systemic lupus erythematosus and fibromyalgia), neurological diseases (multiple sclerosis), and gastrointestinal disorders (Crohns Disease). The suggested potential mechanisms for the beneficial effects of aerobic exercise are discussed and some basic guidelines for exercise prescription in this kind of populations are given."

Chapter II - Public health physical activity recommendations state that moderate-intensity aerobic physical activity for a minimum of 30 min on at least five days each week confers substantial protection against chronic diseases such as cardiovascular disease, atherosclerosis, type 2 diabetes, insulin resistance, colon cancer and breast cancer. The mechanisms responsible for the protective effects of exercise are not completely clear. Nowadays it is well-known that these diseases are associated with chronic low-grade systemic inflammation. Thus, it has been suggested that the modification of the levels of the inflammation markers may have therapeutic potential.

In general, the plasma cytokines found following acute bouts of exercise suggest that exercise induces a strong anti-inflammatory effect. This finding may provide, in part, a mechanism as to why physical exercise either reduces the susceptibility to, or improves the

symptoms of diseases associated with low-grade inflammation. In fact, muscle contraction induced factors with anti-inflammatory actions, which are released to the circulation during exercise, may be involved in mediating the health beneficial effects of exercise and play important roles in the protection against these diseases associated with low-grade inflammation. Furthermore, cross-sectional studies demonstrate an association between physical inactivity and low-grade systemic inflammation in healthy subjects, in elderly people, as well as in patients with intermittent claudication. However, it is not clear how chronic moderate exercise could perform its anti-inflammatory effects. It has been hypothesized that the long-term healthy effect of exercise may to some extend be ascribed to the anti-inflammatory response elicited by acute bouts of moderate exercise. In addition, it has been suggested that following acute exercise, there is a transient increase in circulating levels of anti-inflammatory factors, whereas chronic exercise reduces basal levels of pro-inflammatory cytokines. Recent studies have suggested that continuous an additional subtle changes resulting in reductions in fat and body mass or in improved lipid and glycemic profiles could induce the anti-inflammatory effect of regular moderate-intensity exercise.

The aim of this review is to examine the anti-inflammatory effects of aerobic exercise and to discuss to what extend the exercise induced anti-inflammatory response may play a therapeutic role in chronic diseases associated with low-grade inflammation.

Chapter III - Parkinson's disease is the second most common neurodegenerative disorder, following Alzheimer's disease, affecting approximately 1% of the population older than 50 years. Since the incidence of the disease increases with age (the most important risk factor), it is likely that the number of people suffering from Parkinson's disease will rise as improved health care lengthens the average life span. Classically, Parkinson's disease is considered to be a motor system disease and its diagnosis is based on the presence of a set of cardinal motor signs (e.g. rigidity, bradykinesia, rest tremor and postural reflex disturbance). These symptoms of Parkinson's disease mainly result from the progressive degeneration of dopamine neurons of the *substantia nigra pars compacta* (SNpc) that project predominantly to the striatum. Nowadays there is considerable evidence showing that deficits in olfactory and cognitive functions precede the classical motor symptoms seen in Parkinson's disease. The beneficial effects of the drugs currently available for the treatment of Parkinson's disease (such as levodopa) on improving the cognitive function affected in this disease is controversial. Thus, the management of non-motor symptoms of Parkinson's disease remains a challenge. Over the last decade, regular physical exercise has been implicated to an increased plasticity in the adult brain (such as increase in neurogenesis and cognitive processes and neurotrophic factors production). Research is now emerging on a possible influence of physical exercise in the neurodegenerative process associated to Parkinson's disease. The present chapter attempts to review results reported in different clinical studies and animal models to provide a comprehensive picture of the role of physical exercise in Parkinson's disease. Although many of the training programs investigated were accompanied by some degree of oxidative stress, which should be taken into account in physical training programs for this population, it is important to emphasize that this response did not promote any negative impact on the rehabilitation aspects of Parkinson's disease patients. Taken together, the current literature suggests that regular physical exercise can present beneficial effects in Parkinson's disease patients evaluated through different tests. It might also afford protection against dopaminergic neurons death and motor dysfunction elicited in experimental models. Finally, this chapter shows recent findings from our laboratory indicating that

moderate physical exercise plays an important role into improvement cognitive deficits in an experimental model of Parkinson's disease, reinforcing the potential of physical exercise in the management of non-motor symptoms of Parkinson's disease.

Chapter IV – Introduction: The Transalp Challenge (TAC) is one of the most difficult mountainbike (MTB) stage races in the world. Professional and amateur cyclists are required to cope with an altitude difference of 22500 m and a distance of 662 km within eight successive stages. Therefore, the purpose of this study was to determine the nutrient intake during the TAC.

Method: The subject was a female vegan MTBer (age: 30 years, height: 1.61 m, body mass: 49 ± 1 kg) finishing the TAC 2004 (41 hours 59 minutes 45 seconds, final ranking of 16$^{th}$ place). The athlete has been successfully following a vegan lifestyle for five years. Dietary intake was completely recorded over the full period of competition. Fluid intake (FI) and energy intake (EI) were calculated and subdivided into macronutrients carbohydrate (CHO), protein and fat.

Results: The exercise intensity of 88 ± 2 % of $HR_{MAX}$ determined in the field was maintained over eight days. EI was found to be 24.61 MJ/day. Total calories contribute to 83.3 % from CHO, 7.5 % from protein and 9.2 % from fat. The female ingested 17.4 % pre–race, 35.2 % while racing and 47.4 % post–race.

Discussion: This was the first study showing a well planned vegan diet to adequately meet the nutritional demands of severe MTB stage racing. The dietary requirements of a TAC are challenging for several reasons. Opportunities and time available for FI and EI are restricted by a great diversity of terrains and traits (difficult nature of course profile) simultaneously with aggressive riding tactics. After many years of research, mainly focused on health aspects, the effects of a plant–based diet on athletic performance are still unclear. However, any athlete, regardless of whether omnivore or vegan, should plan his/her diet carefully to avoid the risk of nutritional deficiencies and adverse effects on performance. It is broadly accepted that athletes involved in heavy endurance exercise should ingest a higher amount of energy from CHO to maximize muscle glycogen synthesis. The main advantages of vegetarian diets are the higher amount of CHO, lower fat and adequate protein. Especially vegans consume the majority of their energy from CHO. Therefore, endurance athletes may adopt vegetarian diets as an optimum strategy. Generally, endurance training and competition tend to reduce iron stores. However, iron deficiency occurs in 20 % of the world population, reflecting a similar incidence among vegetarians or vegans compared to omnivores.

Chapter V - Over the last decade, there has been growing interest in the health benefits of exercise for the prevention and treatment of metabolic syndrome disorders.

Currently, the effectiveness of exercise to prevent fat mass gain or to improve the health status of obese people has mainly been assessed through the capacity of exercise to elicit the highest rate of whole body fat oxidation. Hence, low to moderate intensity exercise of duration between 30 to 45 minutes is widely recommended. However, numerous factors affect the mechanisms which control substrate mobilization and utilization. For example, maturation induces changes in substrate metabolism as children tend to oxidize more fat at the same relative submaximal intensity than do adults. Also, studies involving women participants have shown a larger contribution of lipids to energy expenditure. These differences are explained by the effects of ovarian hormones on lipids mobilization, muscle free fat and glucose uptake and oxidation. Acute carbohydrate (CHO) ingestion during exercise has been shown to promote increased CHO oxidation. Similarly, long term, diets rich

in CHO and fat promote increased oxidation rates. Furthermore, metabolic alterations such as insulin resistance, abdominal obesity or decreased cardiorespiratory fitness are factors associated with alteration of the mobilization and oxidation of lipids in fat depots. If exercise is to be used as a therapy, all these factors must be taken when establishing the intensity, duration and mode of exercise in children and adults.

However, other modes of aerobic exercise could be just as potent in the treatment of diseases associated with obesity. Indeed, results from a smaller number of investigations in trained individuals indicate that higher exercise intensities elicit a higher utilization of intramuscular triglycerides. Furthermore, it has been shown from the work of Essen in the 1970s that high intensity intermittent exercises, which also improve maximal aerobic capacity, can elicit rates of fat oxidation similar to those observed during moderate intensity continuous exercise. Therefore, it remains to be determined if this type of exercise is as effective as low intensity exercises in the treatment of metabolic diseases and to evaluate the relative importance of the fat oxidation rate as the best single criterion outcome.

This review will discuss the relationships between the substrates mobilization and utilization during aerobic exercise and the metabolic health benefits.

Chapter VI - This chapter present the effects of aerobic training on the adaptation of the cardiovascular system to exercise in prepubertal boys and girls. The major results of the scientific literature showed that the training program led to a rise in maximal $O_2$ uptake ($VO_{2max}$), brought about however only by an increase in SVmax in both sexes. Moreover, boys increased their $VO_{2max}$ to a greater extent than girls only because of a higher SVmax improvement. No alterations were noticed in the SV pattern from rest to maximal exercise, indicating that the increase in SVrest was a key factor in the improvement of SVmax and thus $VO_{2max}$. Regarding resting echocardiographic data, an increase in left ventricular end-diastolic diameter, concomitant with an improvement in diastolic function, were observed after training and constituted an essential element in the rise in $VO_{2max}$ after training in these children. Also, during maximal exercise, a decrease in systemic vascular resistances, probably indicating peripheral cardiovascular alterations, could have also play an important role in the increase in $VO_{2max}$.

Chapter VII - Results from studies involving adult participants have definitively established that physical activity and cardiorespiratory fitness are inversely correlated to morbidity and mortality. The evidence of the health benefits for physically active and fit adults is well known. There is a wealth of data which has shown that physically active and fit adults can help attenuate the effects of hypertension, insulin resistance, hyperlipidemia, obesity and cancer. However, the relationship between activity, fitness and the health benefits during childhood are less well established. Although it is intuitive to propose that an active child will become an active adult, the research evidence is weak. Similarly, the extent to which children's fitness and activity must decrease to seriously compromise their current or future health is also unknown. There is however growing concern for the future health status of children due to the increased levels of overweight and obese children and increased reporting of cardiovascular risk factors. Prospective data is needed to elucidate the complexity of these relationships. This complexity is partially due to problems related to 1) methodology i.e. how do we measure activity and health outcomes precisely; 2) biology i.e. children are growing and maturing at different rates and 3) sociology i.e. the effects of the environment. These problems therefore pose real challenges for policy makers as to whether they should concentrate resources on those child individuals who are deemed 'at risk' i.e. low

fitness and low physical activity patterns or to focus across the whole child population. This review will explore the relationships between physical fitness, activity and health in young people as well as describing the evidence for health benefits in this age group. The review will also discuss the implications for strategies of health related physical activity promotion at local and national levels.

Chapter VIII - Physical activity is vital for overall health maintenance, particularly cardiovascular health. Additionally, physical activity is important for decreasing the risk of cancer and osteoporosis in women. Physical fitness, a benefit of physical activity, is important during pregnancy and postpartum periods for both women and their babies. As women became more aware of this issue, their participation in physical activity increased. Upon becoming pregnant, many women posed their Ob/Gyn physicians with the question, "is physical activity during pregnancy safe?" Initially, little was known about the effects physical activity had on the expectant mother or fetal development. Research has led to a better understanding of maternal and fetal physiology and findings highlight the importance of physical activity during this time. This chapter provides an overview, which examines aspects of physical activity in regard to pregnant and lactating women. Based on the available literature, physicians have shifted their focus from assuring patients that physical activity during gestation is safe to encouraging physical activity during pregnancy because of the potential benefits to both the fetus and mother. Ultimately, these benefits are realized at labor and delivery and during the mother's recovery period. Current research into the fetal and neonatal benefits of maternal physical activity is explored. Lactation represents a continuation of the pregnancy, as the mother continues to supply nourishment for her infant. The effects of physical activity during lactation are viewed from the maternal and infant perspective. As research advances, American College of Obstetricians and Gynecologists (ACOG) guidelines continue to reflect these gains in information. An overview of the current ACOG guidelines is considered. Lastly, the chapter expresses what has been done, and what is currently being done to encourage women to stay physically active during their pregnancy.

Chapter IX - The pioneer studies on the biomechanics of martial arts were published in the nineteen sixties and seventies. After these articles were published, several other biomechanical studies have been conducted about martial arts and other related punching sports using a variety of different measures and methods, especially in the last decade. In general, these studies were concerned with the enhancement of performance and extending the understanding of injury risk. This paper presents a comprehensive review on this subject. It is divided in two major topics: the first topic covers articles about the kinetics, kinematics and electromyography of specific hand strikes, kicks, throws and fall techniques; the second topic focus on some aspects of motor behaviors and perceptual abilities fundamental for efficient and successful performances in martial arts and combative sports (i.e. repeatability of movement, reaction times).

Chapter X - Training control and evaluation of athletes is, nowadays, seen as a fundamental tool to increase the efficiency of the training process. Thus, coaches and their collaborators often implement a set of tasks that allow evaluating the level of development of the athletes' performance determinant factors as well as the result and adequacy of the training exercises and programs.

Sport modalities like running, swimming, cycling and rowing, due to their characteristics (individual, cyclic, closed and combined modalities) are more easily measurable. From the

several determinants of the specific performance of these athletes, the bioenergetical and biomechanical factors seem to be the most important and, consequently, the most studied.

The purpose of the present chapter is to present recent data obtained in protocols implemented in cyclic sports, giving more emphasis in running and swimming. The bioenergetical studies presented focus on the characterization of the capacity and power of the two larger body energy systems (the aerobic and the anaerobic ones) through the assessment of well-known physiological parameters like the anaerobic threshold, the maximal oxygen uptake (and the corresponding velocities) and the maximal blood lactate concentrations. Complementarily, recently proposed tests are also presented (e.g. critical velocity).

The authors hope that the presented protocols could be well accepted and applied by athletes, coaches and scientists in their training control programs, helping them to increase the training efficiency and even contributing to predict performance.

Chapter XI - The present chapter was designed to investigate the performance and fatigue in an incremental 6 x 1000 m running test. Well-trained endurance athletes performed eight non-fatigued sprints from 5 $m \cdot s^{-1}$ to maximal velocity and the 6 x 1000 m running test on a 200-m indoor track. In order to investigate the fatigue induced changes in force production during running, non-fatigued ground reaction forces and ground contact times were compared to the values measured at the end of the last 1000-m run. The performance in the last 1000 m ($V_{1000m}$) correlated significantly with $VO_{2peak}$ ($r = 0.68$; $P = 0.001$), velocity at 4 mM blood lactate level ($r = 0.76$; $P = 0.000$), running economy ($r = -0.47$; $P = 0.042$), maximal sprint running velocity ($r = 0.52$; $P = 0.023$) and anaerobic energy production ($r = 0.63$; $P = 0.004$). $V_{1000m}$ was also related to the fatigue at the end of the 6 x 1000 m ($r = -0.63$; $P = 0.004$). When fatigued and non-fatigued running were compared at the same velocity, it was observed that ground contact times increased ($P = 0.001$) and vertical ground reaction forces ($P = 0.000$) decreased in fatigue. The results showed that the performance in the incremental 6 x 1000 m test on a track is not only related to the traditional endurance performance characteristics, but neuromuscular and anaerobic performance characteristics and fatigue resistance are also important determinants of the incremental running test.

Chapter XII – Purpose: To describe the aerobic exercise capacity and its relationship with muscle strength and motor competence in fifteen preterm born school-aged children (9 boys; gestational age (GA) 29.7 ± 1.71 weeks; birth weight (BW) 1313 ± 356 gram; age of assessment 7.99 ± 0.35 years).

Methods: Weight, height and skinfolds were measured in a standardized manner. Muscle strength was assessed with a hand-held dynamometer, pulmonary function using a spirometer, aerobic exercise capacity using a graded treadmill exercise test, and motor competence with the Movement Assessment Battery for Children. In addition, a 3-day physical activity record was filled out.

Results: Aerobic exercise capacity, lower extremity muscle strength and pulmonary function were significantly reduced compared to reference values. Aerobic exercise capacity was associated with pulmonary function and BW.

Conclusion: In the authors pilot study of preterm born children the authors found a reduced aerobic exercise capacity and lower extremity muscle strength in our group. Encouragement of active participation in physical activities from early childhood onwards might be important indicated in preterm born children.

Chapter XIII - This study examined differences in physique and skeletal dimensions between 1146 elite Caucasian athletes classified into endurance, strength, speed, upper body

or combined sports categories and controls, to test the hypothesis that athletes of certain types of sport would exhibit a distinct morphology commensurate with their task. Participants were measured by experienced anthropometrists using an internationally-recognised protocol to describe physique. This involved calculating the anthropometric somatotype in terms of fatness, musculoskeletal robustness and linearity. Further skeletal measures were acquired sufficient to describe an array of morphological indices: crural index (tibial height / femur length), skelic index (leg length / sitting height), androgyny index (biacromial breadth / bicristal breadth) and brachial index (forearm length / upper arm length). Significant inter-group differences in indices prevailed after adjustment for age. Endurance athletes had a high crural index and low brachial index, relative to controls. A low skelic index appears characteristic of female strength athletes while a low brachial index is typical of female endurance and strength athletes. Bayesian cluster analysis has shown the crural index in particular is a discriminant in phenotypic categorisation, in addition to the primary somatotype components of endomorphy, mesomorphy and ectomorphy. These findings are congruent with biomechanical imperatives to maximise force and/or minimise energy expenditure offering sports-specific advantage. Because the skeletal relationships do not respond to the conditioning stimulus in the same way adipose and muscle tissue do, the observed inter-group differences suggest a self-selection of athletes into sports in which they are likely to excel.

Chapter XIV - Patients with chronic kidney disease (CKD) have increased cardiovascular morbidity and mortality. They are frequently deconditioned as a result of inactivity, malnutrition, and abnormal muscle function In advanced CKD, hyperparathyroidism, acidosis, and severe catabolism/malnutrition contribute to debility. Patients with CKD often have cardiovascular risk factors such as inadequate blood pressure control, impaired fasting glucose (or overt diabetes), impaired insulin secretion and/or insulin resistance, abnormal lipid profiles, decreased testosterone and/or estrogen levels, and poor quality of life. Other non-traditional risk factors, such as sympathoactivation, inflammation, oxidative stress, and endothelial dysfunction, are also thought to increase cardiovascular morbidity and mortality. In addition to physical disease, CKD is associated with abnormal mental health, including depression, anxiety, and a feeling of helplessness and lack of well-being.

Aerobic exercise has been proposed to have beneficial effects in CKD. This chapter seeks to define the mechanisms whereby aerobic exercise may benefit such patients. The type, duration, and recommended intensity of exercise will be discussed. While aerobic exercise is relatively safe for most CKD patients, the potential pitfalls of aerobic exercise and concerns about its safety will be addressed. The effects of exercise in the adult non-dialysis CKD population and end-stage renal disease (ESRD) population on dialysis will be clarified. Home exercise, and interdialytic versus intradialytic aerobic exercise will be discussed. Children with CKD are also susceptible to muscle weakness, low aerobic capacity, and abnormal fat composition; the impact of aerobic exercise in the pediatric CKD population will also be discussed. The effect of aerobic exercise on muscle weakness, weight loss, graft loss, and mortality in CKD patients post-transplantation will be illuminated. Finally, emphasis will be placed on areas novel to aerobic exercise and CKD requiring further research.

Chapter XV - The aims of the present study were: a) to identify the effects of plyometric training on explosive strength [squat jump (SJ), countermovement jump (CMJ), mechanical power (MP)], agility (AG), and 20-m sprint speed (20 m) variables in young basketball

players; and b) to understand the effects of short-term specific detraining and reduced plyometric training on the previously achieved gains.

The sample consisted of nineteen male basketball players (13-14 years old; weight, 61.26.74 kg; height, 175.46.77 cm). The adopted structure was based upon two fundamental phases. First, subjects were submitted to an 8-week plyometric training program (standing jumps, multiple jumps, box drills, depth jumps, jumps with extra-loads), three times a week. At the end of this period, the subjects showed statistically significant increases in all the assessed variables ($p< 0.05$).

Subsequent to the plyometric training application, subjects were randomly assigned to one of two groups: a reduced training group (RT, n=9) and a specific detraining group (SDT, n=10). During the following four weeks, the former performed a single plyometric training session and the latter ceased plyometric activity. Both groups kept on regular basketball practice. In this period, RT group significantly increased ($p< 0.05$) SJ, CMJ, and S20 values, while SDT group showed statistically significant enhances ($p< 0.05$) on 20 m and AG test. The RT and SDT groups maintained the values of the remaining variables. At the end of this period, no statistically significant differences were observed between RT and DTR groups in all the evaluated variables. In conclusion, a) the outcomes highlight the efficacy of the plyometric training design; b) the reduced training program and the specific detraining indistinctly contribute to the explosive strength levels maintenance; and c) basketball training has an obvious power in the maintenance and sustainability of motor performance at least taking into account the applied training program.

Chapter XVI - The home-field advantage is a topic of much debate in the research literature. This experiment attempted to assess whether there was an advantage for boxers performing in a home country in championship bouts due to judging bias. Official records of all championship bouts in 2006 were analyzed to see if the number of judges that shared the champion's home country was associated with a bout's outcome. It was found that the increased number of judges from a champion's home country produced a disadvantage for the champion when the bout occurred in the United States. These findings are discussed in the context of psychological reactivity.

Chapter XVII - According to a recent World Health Organization report, children and adolescents worldwide are physically inactive during 50% of a normal week (http:// www.euro.who.int/Document/e82923.pdf) and the low physical activity level tracks into adult life, with one-third of the disease burden in adulthood being related to such youth behaviour as physical inactivity (http://www.who.int/features/factfiles). Current public health policy lacks routine management of asthmatic child patients; therefore, public health promotion for the future referral of paediatric and adolescent asthmatic patients to chest clinics with standardized equipment available for aerobic capacity testing is urgently recommended.

Milgrom & Taussig affirmed that all asthmatic children should be questioned about their "exercise habits and exercise tolerance," and those with a concerning history should have an exercise test. Such recommendations address populations of asthmatic youth in the global community.

Numerous scores of physical activity exist. One was validated recently and originates from a questionnaire concerned with the frequency and extent of vigorous physical recreational and sports activity after school.

Early detection of physical inactivity and low aerobic capacity addressed by relevant public health policy implementations can be expected to reduce individual and public health

care costs by preventing morbidity, disability, and mortality from such chronic respiratory diseases as paediatric asthma.

Chapter XVIII- This chapter is intended to provide a comprehensive review of the various theories of social and environmental factors that influence athletes' motivation in sport. In order to achieve this, a short historical review is conducted of the various ways in which motivation has been studied over the past 100 years, culminating in the 'social-cognitive' approach that undergirds several of the current theories of motivation in sport. As an outcome of this brief review, the conceptualisation and measurement of motivation are discussed, with a focus on the manner in which motivation may be influenced by key social agents in sport, such as coaches, parents and peers. This discussion leads to a review of Deci & Ryan's (2000) self-determination theory (SDT), which specifies that environments and contexts which support basic psychological needs (competence, relatedness and autonomy) will produce higher quality motivation than environments which frustrate of exacerbate these needs. The research establishing the ways in which key social agents can support these basic needs is then reviewed, and the review depicts a situation wherein SDT has precipitated a way of studying the socio-environmental influences on motivation that has become quite piecemeal and fragmented. Following this, the motivational climate approach specified in achievement-goals theory is also reviewed. This section reveals a body of research which is highly consistent in its methodology and findings. The following two sections reflect recent debates regarding the nature of achievement goals and the way they are conceptualised (e.g., approach-avoidance goals and social goals), and the implications of this for motivational climate research are discussed. This leads to a section reviewing the current issues and concerns in the study of social and environmental influences on athlete motivation. Finally, future research directions and ideas are proposed to facilitate, precipitate and guide further research into the social and environmental influences on athlete motivation in sport. Recent studies that have attempted to address these issues are reviewed and their contribution is assessed.

Chapter XIX- Superstition can be defined as a person's unrealistic perception of control over behavioral outcomes in different situations. Although it is assumed that superstitious beliefs may help athletes prepare for a competition, they represent a rather unexplored area in sport psychology. The aim of the present study was to investigate the influence of superstitious beliefs on several performance-related dispositions, such as achievement goals, locus of control, self-handicapping and trait anxiety, and then examine the moderating role of athletes' age and years of competitive experience. The sample of the study consisted of 297 male basketball athletes ($M = 23.86$, $SD = 4.63$) participating in Greek professional leagues. The athletes completed a questionnaire regarding measures of positive and negative superstitious beliefs, self-handicapping strategies, internal and external locus of control and luck, achievement goals and trait anxiety. The results of the regression analyses indicated that positive superstitious beliefs significantly predicted self-handicapping and external locus of control. Negative superstitious beliefs were significant predictors of somatic anxiety, worry, and performance avoidance goals. Moderation regression analysis further indicated that the effect of superstitious beliefs on worry was stronger among athletes with less sports experience. The present study provides valuable information regarding the role of superstitious beliefs in better understanding athletes' cognitive and affective responses, and sets the basis for future research in this rather unexplored area.

Paranormal beliefs reflect a person's belief in phenomena that contradict the basic principles of scientific thinking. Those beliefs include superstition (i.e., black cats and breaking mirrors cause bad luck), precognition (i.e., psychics and astrologers can predict the future), extra sensory perception and a range of similar phenomena (i.e., some people can move objects with the power of their mind). In other words, superstitious beliefs reflect people's tendency to make causal inferences and offer explanations for several phenomena without necessarily taking into account, or even sometimes by contradicting, scientific evidence pointing to alternative and more scientifically-grounded explanations.

Past research has shown that superstitious beliefs are associated with adverse psychological outcomes, such as low self-efficacy, high trait anxiety and dissociative experiences , irrational beliefs and external locus of control. On the other hand, Dudley found that higher scores in superstitious beliefs can help improve performance in solving puzzles during instances of uncontrollability because they may prevent this lack of control. The evidenced effect of superstitious beliefs on task performance may have implications for the study of athletes' performance in sports.

Nevertheless, research in this area is scarce. An early study by Neil, Anderson, and Sheppard showed that highly competitive ice hockey athletes were keen on adopting superstitious behaviours, such as rituals. In another study, Buhrmann and Zaugg suggested that higher scores in religiosity led to stronger superstitious beliefs among basketball players. Van Raalte, Brewer, Nemeroff, and Linder further indicated that people who believed they could control chance events through their actions were more likely to adopt superstitious behaviors. Ciborowski suggested that athletes tend to adopt superstitious behaviors as a way to improve their performance, without necessarily admitting a direct connection between the adopted behavior and their actual sports performance. More interestingly, he reported that if an individual believed that a particular behavior could improve performance, that behavior should not be considered superstitious. Furthermore, Bleak and Frederick reported that the use of superstitious rituals varied across sports, and that the most frequently used superstitious behaviors were not necessarily the ones that were rated by the athletes to be most effective in improving sport performance. Finally, a more recent study indicated that superstitious beliefs significantly affected performance in free-throw shot in basketball.

Uncertainty and lack of control have been proliferated as important determinants of superstitious beliefs, similar to the experience of anxiety, In fact, superstitious beliefs may increase during periods of ambiguity, uncertainty, or uncontrollability, and soothe people by providing an illusory sense of control, or at least an explanation of why events are uncontrollable. In simple words, in the face of uncertainty, individuals attempt to achieve control by investing in irrelevant objects or actions, resting on the assumption that there exists a causal link between those objects or actions and particular results.

Despite anecdotal reports published in newspapers and magazines on the influence of superstitious beliefs on sport performance, there is only limited scientific evidence about sport-related superstitions. For instance, Ciborowski and Schippers and Van Lange found that elite athletes are more likely to employ superstitious rituals in high uncertainty and anxiety-provoking situations, as well as in important competitions. Additionally, anxiety was also associated with the use of rituals. Athletes' skill level and task difficulty were also found to influence superstitious beliefs. Specifically, low skill athletes in an easy condition and high skill athletes in difficult condition had the higher scores in superstitious behavior to this

evidence, Bleak and Frederick reported that the use of rituals was not associated with anxiety or perceived importance of success in collegiate athletes.

Chapter XX- Developmental risk researchers has made it possible to identify youth who are significantly more likely than their peers to succumb to at-risk and high risk behaviors often leading to emotional or social disturbances. Two forms of risk are recognized by these researchers. The first involves youth with demographic risk are those with multiple environmental at risk experiences that increase the likelihood of disturbance, including poverty, exposure to violence, or familial disruptions. The second focuses on youth with what is commonly referred to as "functional risk.' Functional risk experiences are those who do not meet recognized criteria for a clinical or psychiatric disorder but do offer evidence of early dysfunctional behaviors that may represent the early stages of such disorders. Both functional and demographic risk has become the basis for selected preventive interventions. This chapter addresses an approach for intervention specialists that offer a case illustration involving student athletes and their use of over the counter pain medications.

Available research suggests that at risk youth are predisposed to drug abuse. Prior to the turn of the century, the NIDA Resiliency and Risk Workgroup convened a group of experienced clinical researchers with expertise in areas of drug abuse and related research to determine how the further application of available research based data can advance prevention effectiveness beyond current levels. Dr. Alan Leshner, Director of the National Institute on Drug Abuse is a psychologist and behavioral scientist and provided the leadership for this team. The research team generated several key recommendations that should be a model for prevention science research. The major recommendations of the group included advocated the development of prevention interventions which target: youth within the family setting and encouraged family functioning and communication as critical buffer against problematic personality characteristics and at risk behaviors among youth.

Chapter XXI- Objective

Characteristics of social relationships such as friendship quality have important motivational implications within the context of sport. The purpose of this study was to examine the utility of Basic Psychological Needs Theory as a framework for understanding friendship quality amongst athletes competing in adapted sport.

Methods

Participants (N = 51; 55.80% male) drawn from cohorts reporting either a congenital or acquired disability completed a self-report instrument on a single occasion assessing perceived competence, autonomy and relatedness experienced when engaged in adapted sport. The instrument also contained the Sport Friendship Quality Scale to assess perceived friendship quality in sport.

Results: Bivariate correlations revealed a pattern of moderate-to-strong correlations between the five SFQS dimensions and a weak-to-moderate pattern of associations between indices of psychological need satisfaction. Simultaneous multiple regression models indicated that perceptions of psychological need satisfaction accounted for small-to-moderate amounts of the variance in the five SFQS constructs. Perceived relatedness was the dominant predictor of sport friendship quality irrespective of the SFSQ dimension investigated with the strongest association evident with SFSQ-Companionship and Pleasant Play and the weakest with SFSQ-Conflict.

Conclusion