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IMPACT
OF OUTDOOR SPORTS
ON HEALTH

Bachelor thesis
Physical Education and Sports

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Tartu 2013
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INTRODUCTION

In the last 20 years, people were working on new approaches aimed at improving the citizenship lifestyle, relating them to natural environments and everything that surrounds.

This new trend, has made possible the creation of alternative places where humans can find their identity and interact with the environment.

The contemporary society and the new trends of thought have been sensitized with the relation between human and nature, creating new social structures and awareness regarding the surrounding environment.

Another important aspect of society is the school education, where professors have the duty to educate and sensitize the children into this new lifestyle, with the aim of improve their surroundings and quality of life. The education must incorporate approaches that help to sensitize the pupils with the surrounding environment and enhance their knowledge about it, thus creating a greater integration with it.

The society have to awareness of the importance of natural environments and acquire mechanisms and strategies for its understanding, appreciation and enjoyment. Therefore, the education and actions we take in natural environments should be meaningful for the pupils. They must have respect, care and protection all around them.

In conclusion, the main purpose of this Bachelor thesis was to analyze the relationship of people with natural environments and how it can improve the overall health.
1. REVIEW OF LITERATURE

1.1. DEFINITION AND CLASSIFICATION OF OUTDOOR SPORTS

Some Spanish authors proposed different definitions of outdoor sports and the closest one to this research is Acuña’s (Acuña, 1991). Outdoor sports are considered every sport that are usually practice in a wild or semi-wild area. These sports are very adaptable to every kind of persons, ages, physical level and technique, with the goal of improving the people life quality, health, family and social relationships. We usually practice outdoor sports in our leisure time and the main place to practice them is in the wild or semi-wild area, but it is possible to practice them in an urban area as well (Acuña, 1991).

Several authors have classified these kind of sports for AFMN (Actividades Físicas en el Medio Natural – Physical Activities in the Environment) in different ways as well (Acuña, 1991, 1994; Funollet, 1995; Aguado, 2001; Igual, 2005):

Acuña (1991) for instance, focused in his classification of outdoor sports upon the environment and techniques we can use while doing it. The classification is divided in three parts, namely promotional activities, free activities and organized activities. In terms of promotional activities, the main goal of these kind of activities is to get as much participants as possible, it is necessary the presence of a promoter, for example: excursions, ecological marches, visit to natural area. Free activities promote the free use of natural resources, there is not necessary the presence of a monitor but it is necessary to have a good knowledge of these resources, for example: ecological, cycling and hiking routes. Organized activities, for its development it is necessary the presence of a monitor (person who organize, control and guide groups in the activity) and a good planning. Organized activities themselves are classified according to the technical requirement: activities in nature, complementary activities, and adventure sports in nature. The activities in nature comprise activities like hiking, camping, and games in the nature. The complementary activities, there are activities which help the practice of
other, like first aid techniques. Finally, adventure sports in nature which is classified in water sports (canoeing, rowing, sailing), land sport (climbing, alpinism, caving) and air sports (paragliding, hang-glider, air balloon).

Funollet (1995) focused in his classification of outdoor sports upon the practicing, material, and practice space. Practicing means the person who participate in the activity and the activity can be individual (the person is alone), imbricated (small group in which every movement is conditioned by the partner, for example k2 kayac) or in groups (there are group of more than 3 or 4 people). Material or the energy means the driving fource the participant use while doping the activity. It can be generated (the action is caused by the practising, for example hikking) or self-generated (the action is caused by another variable, for example animals, gravitational, hydraulic, wind, solar and motor). Space means the environment, where the activity takes place and it can be in the sea, river, lake, rock zone, cave, zone with flora, dessert, mountains higher than 3000 m and spaces modified by humans.

Aguado (2001) focused in his classification of outdoor sports, similary with Funollet (1995), upon the environment where the activities are practiced. According to Aguado (2001), non-specific activities, don't need specific space to practice them, for example games in a park. Specific activities, on the other hand, are activities which need a special and natural environment to practice them and are clasificated in land sports (e.g., cycling, climbing, hikking), water sports (e.g., canoeing, scuba-diving, windsurfing) and air sports (e.g., paragliding, hang-glider). Aguado (2001) distinguishes also complementary activities which are basic knowleges (e.g., camping, orientation, knots or basic notions of survival) in order to be able to practise othe more specific activities.

Sánchez Igual (2005) focused in his classification of outdoor sports upon the surface where it’s practiced. It was clasificated in sporting activities done in mountain, water and air. The category of mountain sports was divided into, (1)low mountain (less than 1000 m), where the most common activities are climbing, hikking and cycling, (2) medium mountain (1000-2000 m), where the activities that usually are practised are mountain cycling and camping, and (3) high mountain (more than 2000 m), where the sports practised are more extreme and it is necesary to have a good physical condition to practice those (e.g., climbing, skiing and alpinism). Water sports, can be practised in the sea (e.g., kitesurfing, scuba-diving, sailing, windsurfing), river (canoeing, rowing,
rafting) and lakes (water skiing, sailing). Finally, air sports, for these sports it is necessary the use of external devices (e.g., paragliding, hang-glider, air balloon).
1.2. THE IMPACT OF OUTDOOR ACTIVITIES ON HEALTH

This is a sentence took from a poem (John Muir, 1901 – p.56) that can explain in some words the main meaning of this research and it says textually: “Climb the mountains and get their good tidings. Nature’s peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy” (John Muir, 1901, via Ryan et al., 2010).

It is well-known that the practise of sport reports health and physiological benefits, just to have contact with green spaces can be psychologically and physiologically restorative, reducing blood pressure and stress levels and helping patients to recover faster after a surgical intervention. So it is very important how much time do we spend in contact with nature, because the more time we spend, the more benefits we would obtain (Mitchell & Popham, 2008).

Nature environments, like favorale places have physiological effects on patients with allergies or respiratory diseases. The aroma of the plants, temperature, humidity, light intensity, wind, oxygen concentration and exercise performed within this environment are these kind of favorale factors that can improve the quality of life of people. For these reasons, Yamaguchi et al. (2006) postulated that the physiological effects of forest-air bathing and walking as one health-promoting activity could be used as preventive medicine (Yamaguchi et al., 2006).

There is an also interrelation between green spaces and benefits on mental health and regular engagement, in turn, these is related with longevity and decreased risk of mental ill-health. High levels of self-esteem are associated with healthy behaviors, such as healthy eating, participating in physical activities, not smoking, and lower suicide risks (Barton & Pretty, 2010). According to this statement, Thompson Coon et al. (2010) believed that spending time participating in outdoor activities (e.g., gardening, conservation work, bird watching, rockpool rambles, and gentle to vigorous sporting activities in natural environments) represents an important means of ensuring that people become more active".
Recognising the contribution of natural ecosystems to human population health may contribute to addressing problems associated with inactivity, obesity, mental ill-health, and other chronic diseases. Many of these urgent health challenges are also connected to sedentary and indoor lifestyles. At present, more than half of the world's population live in urban environments and don't have too much contact with nature, so some of the substantial mental health challenges facing society and physical challenges arising from modern diets and sedentary lifestyles could be addressed by increased forms of activity in green places. For example, employers could encourage staff in stressful workplaces to take a short walk at lunchtime in the nearest park to improve mental health, which may in turn affect productivity (Barton & Pretty, 2010).

Luckily, the world's mentality seems that is changing and, day by day, some movements are increasing and working to reconnect people with nature. For example, programs such as the Green Gym and the Blue Gym attempt to motivate people to spend more time being active in natural environments (Thompson Coon et al., 2010).

In contrast, living in urban environments can induce the appearance of different diseases such as chronic fatigue syndrome. Subjects have to be treated appropriately to prevent the development of chronic fatigue system due the increased of fatigue and stress (Yamaguchi et al., 2006).

1.2.1. Perception of vitality after exercise in outdoor environments

Ryan et al. (2010) tried to find a correlation between being in a nature environment and sense of vitality. Ryan et al. (2010) conducted five studies to get some results.

In their study 1, Ryan et al. (2010) created a total of 64 vignettes with different combinations of variables: setting (indoor / outdoor), social interaction (alone / with others) and physical activity (active / sedentary) and they asked people to imagine themselves in these situations and say what is he/she felt in that moment. The items that the authors of the research used to measure the variables were (“I feel alive and vital” / “I have energy and spirit” / “I don’t feel very energetic” / “I feel alert and awake” / “I look forward for each new day” / “I feel energized” / “I feel so alive and I just want to
burst”). The 171 Participants (123 females / 48 males; average age of 20.16 years old) responded on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree), confessing how they felt in this concrete moment. The research found that people reported higher levels of vitality when they are outside, socializing with others and practising physical activity. Another finding was that in sedentary vignettes, participants reported considerably higher vitality when they are socializing than when they are alone.

In my opinion, outdoor experiences reported sense of vitality by itself, but this positive feeling will be improved if we add social relations and physical activity as well.

In their study 2, Ryan et al. (2010) compared the benefits of an indoor walk and an outdoor walk. The sample comprised of 80 participants (66 females / 14 males; average age of 20 years old) who were randomly assigned to a walk in one of two environments. Prior to the experiment the participants, had to fill the Subjective Vitality scale and ratings of current vitality were collected after the experiment. The results indicate that participants who did outdoor walk reported a greater change in vitality compared to participants who did indoor walk.

In their study 3, the potential vitalizing effects of natural environments on attention, interest, positive mood, and benefits to health was examined (Ryan et al., 2010). They used a set of photographic images depicting either natural outdoor settings or scenes of constructed or built environments and a recorded script designed to orient the participants to the experience. Participants were 97 young people (70 females / 27 males) and the average age was 20 years old (age ranged from 19 to 22 years). Ryan et al. (2010) found some increase in participants’ vitality in who were exposed to natural image, relative to some decrease in vitality among participants who watched building slides.

The study 4 by Ryan et al. (2010) made a survey to report on outdoors, social, or physical activities and daily vitality of a complete day-end. The 138 students (41 males / 97 females; average age of 20 years old) were assessed during 14 days, having to complete, each evening before going to sleep, a trait version of the seven-item Subjective Vitality scale, a survey that asked participants to report on outdoors, social, physical activities, daily vitality throughout the day (Ryan & Frederick, 1997, Ryan et al., 2010).
Participants had to respond to daily time outside, daily exercise and daily social interaction. They were asked if they spent more than 20 minutes or not doing these daily actions, they only had to answer “yes” or “no” and in most of the cases the result was positive. The results showed that spending a minimum of 20 minutes outside, practising exercise and with social interaction, participants began to get benefits (Ryan et al., 2010).

Ryan et al. (2010) concluded that being outdoors was vitalizing in large part because of the presence of nature.

In their study 5, Ryan et al. (2010) tested for the potential mediating effects of natural elements on vitality. They measured 51 students (43 females / 8 males; average age of 20 years old) 4-day-experience assessing different variables: Trait of subjective vitality, experience-level measures, presence of others, physical activity, outdoor, nature experience measures and state vitality. Participants were tested six times per day, between the hours of 10 am and 10 pm and they had to complete a questionnaire each day, took from a previous study (signal-contingent form) (Wheeler & Reis, 1991, via Ryan et al., 2010).

In terms of trait of subjective vitality, Ryan et al. (2010) used four points of the SVS (Subjective Vitality Scale) took from a previous research of Ryan & Frederick (1997) to measure trait-level energy and aliveness. Experience-level measures were assessed just asked for their “diary current experiences”. For presence of others, participants were asked for the amount of people they have interacted during each experience. Physical activity was measured by assessing physical activity level during the experience with the following scale: from sitting=low (1) to running=heavy (5). In terms of outdoors, participants had to answer questions about where the experiences took place (indoor / outdoor), understanding by indoor, experiences inside buildings or travel inside vehicles, and for outdoor, every places out of buildings or close places. In the case of nature experience measures, the participants received +1 was given to every natural experience, including thoughts on nature as well and a score of -1 to non-natural experience. Finally, for state vitality, the authors used the same scale as the measurement of trait of subjective vitality (Subjective Vitality Scale) to check how the participants felt in this moment. The only finding remarkable was that individuals were more vitalized when they were exposed to more nature (Ryan et al., 2010).
In my opinion, this research show us that the exposition of nature report a lots of benefits to the state of vitality, but even more if we join this with physical and social activity.

1.2.2. Restorative effects of outdoor environments in the state of anxiety

This research conducted by Mackay et al. (2010) looks for correlations between the practice of sport and the improvement of the general health. The authors of this research proposed that combining physical exercise and natural environments, then, it would offer the prospect of potentially greater benefits than either undertaken in isolation (Mackay et al., 2010).

There are two theories which explain restorative environments (Hartig, 2004, via Mackay et al., 2010): psychophysiological stress recovery theory (Ulrich et al. 1991, via Mackay et al., 2010), which postulates that restoration occurs when scenes elicit feelings of interest and positive affects replace negative affects, and attention restoration theory (Kaplan, 2001b; Kaplan & Kaplan, 1989, via Mackay et al., 2010) which says that restorative environments facilitate to recover from directed attention fatigue.

According to Pretty (2004) there are three different levels of engagement with nature (Pretty, 2004, via Mackay et al., 2010): viewing nature; being in the presence of nature; and active participation and involvement with nature. Each level is considered to play a different role in understanding the psychological effects of outdoor exercise, in other words “green exercise”. Specifically, as for viewing nature (Ulrich, 1986, via Mackay et al., 2010), have proved the recover benefits of being in a hospital room with a view of nature compared to not having. In terms of the presence of nature (Henderson-Wilson, 2005, via Mackay et al., 2010) have demonstrated that residential with better access to natural environments are associated to better quality of life. Finally, active participation and involvement with nature is well recognized as a restorative activity (Hartig, 2006, Kaplan, 1973; via Mackay et al., 2010). According to Mejia (2010), a positive nature experience, increase the postitive effects of exercise.
Research have demonstrated that exercise of 15-30 min, three times per week have been recommended for physical and psychological benefits (Mackay et al., 2010).

There is no definitive answer about the optimal intensity of exercise, but the most reliable benefits appear to be associated with moderate intensity exercise. The research tends to support the notion that acute bouts of aerobic exercise are effective in reducing state-anxiety levels and they discovered that the only significant moderating variable is exercise duration (Mackay et al., 2010).

Several researches have used the term “Green exercise” meaning all the activities people practice in vegetated areas (parks, open places, playgrounds) (Mackay et al., 2010).

Mackay and colleagues (Mackay et al., 2010) assessed 100 people (59 males / 41 females) aged between 20 and 81 years old, doing 20-min-exercise on a treadmill while they were viewing displayed on a screen. They made four groups which were exposed to different images: rural pleasant images (countryside with trees and water), rural unpleasant image (countryside with abandoned car), urban pleasant images (tall buildings with sky reflected in water) and urban unpleasant images (city scene with broken windows and graffiti). Before the experiment, participants were subjected to a pre-tests that included the “State-Trait Anxiety Inventory for Adults (STAI)”, in which they had to value how they felt at the moment in relation to apprehension, tension, nervousness, and worry. Also their blood pressure was taken as a part of pre-test. After the exercise, they were subjected to another tests (post-test), using the Borg Scale with 15-point rating scale ranges from (6) “No Exertion At All” to (20) “Maximal Exertion”. Also, participants were asked to indicate on a and the 10-point Likert scale (1 = “100% artificial; 0% natural” to 10 = “0% artificial; 100% natural”) the degree to which they perceived the exercise environment was artificial or natural. The STAI was used after the exercise as well to measure a state-anxiety post-exercise. The results of this research showed that reductions in anxiety were reported by participants who were subjected of being in a more natural exercise environments. Exercise duration and intensity were not linearly related to changes in state anxiety (Mackay et al., 2010).

In my opinion, this research showed some benefits because of the exposure of natural environments and a logical and determined duration of exercise, but there is no still
enough information to be sure about other variables like exercise intensity and restoration capability.

1.2.3. Benefits of outdoor sports practice on mental health

(Barton & Pretty (2010) meta-analysis) included ten studies that measure self-esteem and mood in total of 1252 participants from United Kingdom pre- and post-activity (i.e., an acute exposure of green exercise) or intervention and compared them. The Rosenberg Self-Esteem Scale (RSE) that is a most widely used instrument to assess self-esteem was used to measure self-esteem in those studies and Profile of Mood States (POMS) was used to measure changes in mood. There were improvements in both self-esteem and mood, but the effect size was higher for mood (Barton & Pretty, 2010).

To investigate whether the intervention effect varied with differing cohorts, Barton & Pretty (2010) made some subgroups divided by the following variables: Exposure duration (5 min / 10-60 min / half-day / whole day); Exercise intensity (low / moderate / vigorous); Type of green space (urban green / countryside / forest / waterside / wilderness); Gender (male / female); Age (<30 / 31-50 / 51-70 / >70); and Starting health status (healthy / with existing mental health problems).

In terms of exposure duration, the greatest changes in self-esteem and mood were evident for least duration 5 min of activity and become lower for 10-60 min and half-day activities and the change in self-esteem and mood increased again for the whole day activities (activities that are taken place for the whole day). This means that there is an immediate effect obtained from the start of green exercise, like Mejia (2010) says “you get a very substantial benefit from the first five minutes”. The positive effect of green exercises diminished a little bit when the exposure reached for the duration of half a day, but the whole day practising exercise gets people to another peak of benefit (Barton & Pretty, 2010).

The greatest change in self-esteem starts with light exercise intensity but decreases when the intensity grows up. As for changes in mood, the response are equally with low
and vigorous exercise intensity and declining to the lowest for moderate exercise intensity (Barton & Pretty, 2010).

Different types of green spaces reported the greatest changes in mood and self-esteem and spaces with waterside show the largest effect size, so spending time near waterside will give a greater benefit.

Both gender groups obtained benefits, so there was no significant differences between gender in changes in self-esteem and mood while exercising outdoor (Barton & Pretty, 2010).

In terms of age, the greatest change was found for the youngest age group in self-esteem. Moreover, mood shows an inverted U-curve with greatest changes in the mid-age groups, so in younger and older groups the mood decreases (Barton & Pretty, 2010).

According to the results of meta-analysis of Barton and Pretty (2010), the people with mental health problems as a starting health status obtained more benefits in changes in their self-esteem than people who reported their starting health status as good. In the case of changes in mood, both of two groups got almost the same benefits (Barton & Pretty, 2010).

In conclusion, findings of this meta-analysis suggests that people who are able to undertake regular, short-duration physical activity in green space, they will accrue health benefits (Barton & Pretty, 2010).

1.2.4. Influence of exposure to natural environments in the functioning of the sympathetic nervous

Yamaguchi et al. (2006) investigated the salivary amylase activity in different environments, urban and nature, following the investigation of Chatterton et al. which demonstrated that the salivary amylase activity was under the influence of the sympathetic nervous system (Chatterton et al., 2000; via Yamaguchi et al., 2006).

Through ‘Shinrin-yoku’ technique that is a ‘forest-air bathing and walking’, in which people attempt to spend a short period of time in a forest environment and performing
certain recreational activities including exercise, Yamaguchi et al. (2006) tested 15 healthy young male university students, taking measures of salivary amylase activity after different activities in two environments. The subjects were hosted in a hotel for 3 days, they were divided into two groups (forest / urban) and the experimental environments were switched each day. The schedule of the day of the experiment was as following: (wake up at 6.00 am / breakfast at 7.30 – 8.30 am / lunch at 12.30 – 13.30 pm / dinner at 19.00 – 20.00 pm / bed time at 23.00 pm). The salivary amylase activity was measured six times in the day (after wake up at 7.00 am / before walking at 11.05 am / after walking at 11.25 am / before sitting and watching at 14.35 pm / after sitting and watching at 14.55 pm / before dinner at 18.30 pm)

The results showed that the lowest range of salivary amylase activity was after walking and the highest was before bed time. According to Yamaguchi et al. (2006) the reason for that is probably because the participants were students and they were used to go to bed later and this time is usually for them the most active moment of the day.

Another important finding was the comparison of salivary amylase activity between both environments, natural and urban environment. Yamaguchi et al. (2006) found that the group which was exposed to nature showed 18.8% lower measure of salivary amylase activity after exercise than the group exposed to the urban environment.

In conclusion, salivary amylase activity measure is a good indicator to evaluate changes in sympathetic nervous activity over time and natural environments are the best places to experience physical and psychological improvement because people experienced much less environment-derived stress (Yamaguchi et al, 2006).

1.2.5. The importance of exposure to natural environments

Mitchell & Popham (2008) research compares the different health inequalities depending on the exposure of time to nature. It also compares the socioeconomic status with greater exposure range to nature. They expected that people with low socioeconomic status are less likely to exercise and they usually have more difficulties in accessing to natural environment because of the environments in which they live are
less conductive to it. The latter authors also hypothesized that poverty causes physiological responses to the stress and this problem could be harder in people who have less exposure time to nature, causing increased risk of various diseases and notably heart disease. More deprived populations with access to green space might plausibly have some protection from the biological effects of their poverty-related stress, decreasing their mortality rates compared with those without access to green space.

Basically, Mitchell & Popham (2008) sought to examine the relations between exposure to green spaces and the different causes of mortality among the population who lived in different areas 2001 and 2005.

The total study population was 40813236, with 366348 deaths and the authors excluded people older than retirement, because in these ages there are no so much inequalities of deaths than in younger ages.

The results of this research showed that incidences of mortality were lower in populations which lived in green areas, besides they would experienced a decreased in rates for all-cause and circulatory mortality. It was estimated that population with the highest exposure to green spaces saves 1328 lives per year. The data also showed that green spaces might affect health by inducing beneficial physical activity, ameliorating the response to stress, reducing smoking rates, and thus rates of lung cancer. The quality and quantity of access to natural environments is strongly associated with the socioeconomic position of individuals (Mitchell & Popham, 2008).

Finally, another important point is the quality of air, because air pollution is one the most important causes of respiratory and cardiovascular morbidity in the world, so the more exposure to natural environments, the more quality of life we will have and it is warranty that the population will have less health diseases (Mitchell & Popham, 2008).
1.3. HEALTH BENEFIT COMPARATIVE BETWEEN OUTDOOR AND INDOOR SPORTS

People choose their exercise environment expecting enhanced physical and mental fitness and better overall health (Bouchard et al., 2007; Lampretch et al., 2008, via Hug et al., 2009) and awaiting for meet new people and enjoy the company of friends (Carron et al., 1996; Ball et al., 2001; Lampretch et al., 2008, via Hut et al., 2009). They also consider the barriers to participation, like the accessibility of facilities close to home, personal safety, the season, and weather are all relevant for physical activity (e.g., Humpel et al., 2002; Titze et al., 2005; Tucker and Gilliland, 2007; Tucker et al., 2009, via Hug et al., 2009).

1.3.1. Benefits of indoor exercise on health

Hug et al. (2009) defined indoor exercise as kind of activities performed in an enclosed room, for example, a fitness centre, sport hall, and indoor swimming pool.

Hug et al. (2009) conducted a one-year survey, in which 319 members of different fitness centres of Zurich were surveyed after they had concluded their exercise session. The survey assessed the 10 following variables to get the prediction of exercise frequency in both indoor and outdoor exercise environments: gender, age, type of education, expected health benefits, expected social benefits, personal time barriers, being away, fascination, coherence, and compatibility. The authors also used some items to classify and clarify some terms like, being away (“It is an escape experience”), fascination (“There is much to explore and discover here”; “My attention is drawn to many interesting things”), coherence (“It is chaotic here”; “There is too much going on”), compatibility (“I can do things I like here”; “Being here suits my personality”) (Hug et al., 2009).

Results scored that participants showed more exercise frequency in indoor environments than in outdoor environments (exercising roughly 1–3 times each week).
indoors and one time outdoors in a 30-day study), had greater expectations of social benefits with exercise indoors, coherence and compatibility appeared to hold at fairly high levels in the indoor settings, and in terms of benefits on health, people experiment increased when participe in indoor exercises because they are practising sports, but this benefits derived from indoor environments are logically the opposite as exercising in outdoor environments. Factors that can consider a barrier to exercise in a kind of environment can be the reason to incentivate the practise in different environments, for example, bad weather (cold, rainy, windy…) can increase participation in indoor activities and decrease the amount of leisure time that people expent in outdoor environments (Hug et al., 2009).

1.3.2. Evidence of physical and psychological benefits in the practice of physical activities in outdoor environments

The beginning of the restorative feeling reported by outdoor activities is the human perception of a natural environment by the brain triggers positive psychological and physiological reactions (Kaplan, 1995; Sternberg, 2009; Ulrich, 1983, via Mitchell, 2012). There are some different effects between practising sport in natural and synthetic environment. In the following variables: self-reported emotions (energy/revitalization, tranquillity/calmness, anxiety/tension, anger/aggression, fatigue/tiredness and sadness/depression), tests of attention, blood pressure and cortisol concentrations were synthesized and the results of these investigations leave us evidence that sports in nature environments will report more benefits than synthetic environments. It reduced negative emotions such as anger, fatigue and sadness. There was a marginally positive effect on energy scores, anxiety and tranquility and positive effect on test of attention as well (Bowler et al., 2010). According with this statement, the outdoor exercise settings had generally higher restorative quality than the indoor ones, becuase more aesthetically pleasing environments might promote exercise. So these higher restorative feelings improve the overall health status of the population (Hug et al., 2009).

Another strong example of the benefits of being outdoor was a survey conducted in eight European cities in 2005, which concluded that people who live in areas with high levels
of greenery are three times more likely to be physically active and 40% less likely to be overweight or obese. Furthermore, outdoor activities reported more long-term adherence than indoor activities, a good example of this statement is that 40-50% of individuals terminate gym membership within a year of joining (Thompson Coon et al., 2010).

Thompson Coon et al. (2010) compared the effects on mental and physical wellbeing, health related quality of life of participation in physical activity depends on the location, in natural environments compared with physical activity indoors. The authors assessed 833 people using different techniques: single short walk or run in an outdoor environment and the same walk in a indoor environment on a separate location, indoor walk with a virtual reality technology and, a survey. Also the chosen places for outdoor trials were very varied, including university campus, sidewalks and walking paths immediately surrounding buildings, forests and country parks (Thompson Coon et al., 2010).

The results obtained in terms of walking showed, after seven studies, that outdoor walk had a positive effect compared to indoor walk on some aspects of mood, revitalization, self-esteem, positive engagement, and subjective vitality. Participants reported increased feelings of energy, pleasure, and delight, and decreased feelings of frustration, worry, confusion, depression, tension, and tiredness. Finally, participants reduced feeling of calmness and tranquility, and expressed their intention to repeat the experience because of the enjoyment of the outdoor walk, so the level of adherence to outdoor activities increased as well (Thompson Coon et al., 2010).

Three studies compared the effects between doing outdoor walks and indoor walks. In two of them, there were no significant difference due the participants were competitive runners, but in a study conducted by Harte et al. (1995, via Thompson Coon, 2010), it was found that participants felt less anxious, depressed, angry and hostile and less fatigued following the outdoor run (Thompson Coon et al., 2010).

Thompson Coon et al. (2010) conducted a survey that showed greater degree of mental restoration following outdoor activity than indoor activity and a more positive attitude to exercising outdoors.
Recently, Mitchell (2012) also compared the mental benefits to participate in outdoor activities compared to do it in other environments using data from the 2008 Scottish Health Survey (SHS, a cross-sectional population health survey which gets the range of behavioural, physiological and contextual information). For measured mental health via a series of questions about respondent experiences in recent weeks (Goldberg & Williams, 1991, via Mitchell, 2012), the author used the General Health Questionnaire (GHQ) and for capture mental wellbeing (Tennant et al. 2007, via Mitchell, 2012), he used the Warwick Edinburgh Mental health and Wellbeing Score (WEMWBS). The GHQ asks the participants if they have experienced a particular feeling (problems with sleep, inability to make decisions, lack of self-confidence and stressed) on a scale ranging from “less than usual” to “more than usual” during the recent weeks. Regarding to the WEMWBS survey, measured 14 statements related to wellbeing in the last two weeks (e.g. “I have been feeling optimistic about the future”, or “I have been dealing with problems well”), and participants were asked to indicated about the frequency they had this feelings on a scale from “None of the time”, to “All of the time” (Mitchell, 2012).

The method used in this research was to analyze the SHS methods, that asked the participants about “the time spent doing different types of physical activity”, and “the places where this activities where located” in the last four weeks. When SHS refers to different types of physical activity, they are every different kind of activities which requires physical effort (e.g., housework, walking, sport and manual work) and for location, it was divided in the following list: (1) woodland / forest / tree covered park; (2) open space / park; (3) country paths; (4) beach / sea shore / lake / river / canal; (5) sport fields / outdoor courts; (6) swimming pool; (7) gym / sport centre; (8) pavements / streets; (9) home / garden; and (10) none of these places. So the SHS collect data of the frequency the participants use each environment using the following scale: not used, once in the last 4 weeks, 2 or 3 times in the last 4 weeks, one a week, 2 or 3 days a week, 4 or 6 days a week, and every day. GHQ model assessed a total of 1890 people and in the case of WEMWBS was a total of 1860 people (Mitchell, 2012).

The research showed that the most common environment for physical activity along the participants were local pavements / streets, followed by home / garden, and the 50% of they used natural environments at least once in the last 4 weeks, actually the number of contacts per week with any natural natural environment was 2.09, higher compared to
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non-natural environment, which was 1.54 contacts per week. Using at least once a week natural environments (open space / park, wood / forest) compared not using these environments, reported lower risk of high GHQ, which is an indicator of poor mental health, so these people were at about half the risk of poor mental health of non-users. In the other hand, less use of open space and regular use of synthetic environments (sport pitch / outdoor courts, gym /sport centre) is related with higher levels of WEMWEBS, due to use of synthetic environments are more associated to sport environments and the practice of sport is significantly associated to wellbeing improvement. In conclusion, natural environments can be used as therapy for poor mental health (Stigsdotter et al., 2011, via Mitchell, 2012), and that studies suggest such environments are actively sought by people facing stress or other problems (van den Berg, Hartig & Staast, 2007; Grahn & Stigsdotter, 2003, via Mitchell, 2007).
1.4. ADVERSE HEALTH EFFECTS OF OUTDOOR SPORTS

Live in a free pollution atmosphere is essential for human health, but in the last three decades the world, especially in big cities, is suffering a big environment devaluation, due to emission controls on vehicles, heating, power generation and industry (US EPA, 2000; Godish, 2003; Defra, 2003, via Curtis et al., 2006), and this progressive devaluation is producing negative effects in groups of people who are especially sensitive to outdoor air toxicants, such as asthmatics, atopic patients, patients with emphysema and bronchitis, heart and stroke patients, diabetes, pregnant women, the elderly and children (American Lung Association, 2005, via Curtis et al., 2006).

Curtis et al. (2006), in 2005, conducted a research of human health effects of outdoor air pollutants by searching Pub Med and other Medial databases. They studied the influence of non-conducive environments in the following eight variables: respiratory effects, cardiovascular system effects, cancer, reproductive and developmental effects, neurological effects, mortality, infection and other health effects.

In terms of respiratory effects, higher outdoor air pollutant levels, such as particulates, ozone, sulfur, nitrogen oxides and carbon oxides revealed higher rates of asthma and other respiratory problems. For cardiovascular system effects, outdoor air pollutants increased the risk of heart problems, like cardiac mortality and morbidity. Four out of five studies showed significantly higher risk of lung cancer due to the exposure to high outdoor levels of pollution (Vineis et al., 2004, via Curtis et al., 2006). Reproductive and developmental problems, such as preterm births (Liu et al., 2003, via Curtis et al., 2006), excess infant deaths (Loomis et al., 1999; Bobak & Leon, 1999, via Curtis et al., 2006), and rates of congenital cardiac defects, have been associated with higher exposure to polluted environments. High levels of outdoor air pollution increased the risk of neurological and neuropsychiatric effects, several studies found higher rates of schizophrenia (Pedersen et al., 2004, via Curtis et al., 2006), headaches in adults (Nattero & Enrico, 1996, via Curtis et al., 2006) and poorer scores on neuropsychological test for memory, concentration, balance, reaction time and cognitive functions (Kilburn & Warshaw, 1995; Kilburn, 1999, via Curtis et al., 2006). In terms of mortality, higher
exposure to polluted environments caused higher rates of mortality (Bunekreef & Holgate, 2002, via Curtis, 2006), and lower rates of lifespan (Dockery et al., 1993; Pope et al., 1995, via Curtis, 2006). It also have been found correlations between high exposures to outdoor air pollutants (wood, coal or dung burning, living in poorly ventilated buildings) and higher rates of respiratory infection. Finally, outdoor air pollutants increased the likelihood of skin cancer, neuropathy and damage to the lungs and kidneys (Liu et al., 2002; Pesch et al., 2002, via Curtis et al., 2006).

1.4.1. Skin problems derived from the exposure to outdoor environments

The most important risk factor for developing skin cancer, both melanoma and non-melanoma skin cancer, is the UV radiation (UVR). For this reason, athletes have the higher risk to contract skin cancer, due to the amount of hours they spent in outdoor environments and the consequent exposure to the sun. For example, the practise of tennis, sailing, and golf was associated with relatively high-UV exposure (Moehrle, 2008). So the most effective way to decrease the risk of skin cancer is reducing the time to sun exposure (Mahé et al., 2011).

Moehrle (2008) conducted a research based on a review of previous studies about the incidence of sun exposure time on the probability of getting cancer, obtaining enough valid results.

First study assessed professional cyclists, runners and mountain guides. The average daily personal UV exposure of professional cyclists in the Tour of Suisse were evaluated, showing 20.3 SED (“standar erythema dose”, that is the standar amount of UVB that produces redness 24 hours after exposure), it is considered a high UV exposure. A bit higher was the average UV exposure of several runners who participated in the Ironman Triathlon World Championships 1999 in Hawaii, it was an average of 20.8 SED. Finally, mountain guides reported the highest average UV exposure of 29.8 SED. 283 mountain guides from Austria, Switzerland, and Germany were examined on professionally sun-exposed skin areas (head, neck, arms), obtaining high percentages of UV exposure and compared to regular people percentage, they got some worrying results in precancerous lesion such as solar keratosis (25% vs 7%), and solar cheilitis (53% vs 12%). The
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principel risk factor for skin cancer was the severe lifetime sunburn due the exposure to altitude and snow reflection (Moerhle, 2008).

From another study, the author got some interesting conclusions about the appearance of cancer in outdoor sports. Overtraining and excessive exercise caused the suppression of the immune function, because of repetitive tissue trauma sustained during intense exercise, so this increased the risk of developing basal cell carcinoma (BCC). Skiers were also assessed and the results showed an increased risk for the development of squamous cell carcinoma, causing an increased risk of melanoma. The causes of this risk increase were almost the same as mountain guides, the exposure to altitude and snow reflection. Finally, high sun exposure during childhood was associated with significant risk increased in cutaneous melanoma (Moerhle, 2008).

In other research about influence of UV exposure on skin cancer, Mahé et al. (2011) took the study reference of assessed the Teté Brulé which assessed 828 children (average age between 8 and 10 years old), who were competing in a football tournament. After three weeks of evaluation, the results showed that children who took part in outdoor sports had more melanocytic naevus on their back. The contact with water, produced higher risk of have basal cell carcinoma (BCC), and sweating reduced the effectiveness of sunscreen, like results proved by Moerhle (2008) that sweating during the practice of sports contributed to UV-related skin damage as it increases the photosensitivity of the skin, facilitating the risk of sunburns. Other significant results during the practice of sports were that clothing worn provided incomplete protection to participants because the designers care more about comfort than protective potential, sports tournaments are usually taken place during peak exposure hours, and children who participate in outdoor sports tended to spend more time outside than these others who don’t do it (Mahé et al., 2011).

There have been discovered some data in this research, such as the reductive influence in UV radiation dose received depending on the colour and size, and the range of UV radiation depending on the angle of the horizontal ambient UV radiation and the solar angle. Finally, the existence of clouds didn’t provide any protection against UV radiation (Mahé et al., 2011).
1.4.1.1. Solar protections as a form of skin cancer prevention

As it is well known that outdoor exercise and the exposure to sun are, some authors of different researches (Moehrle, 2008; Mahé et al., 2011) provided the society some recommendations to prevent future skin cancer problems:

Mahé et al. (2008) recommended primarily to avoid the sun, wear sun protective clothing and use sunscreen. For avoid the sun, the authors recommended to practice sports in the shade or outside peak hours, for example, children should not practise outdoor activities from 11:00 AM to 3:00 PM in summer time. Finally, Mahé et al. (2008) recommended children to wear sunscreen all day long while they are outside.

Moehrle (2008) made some recommendations that consist basically the same as Moehrle et al. (2011) have said before, so the author bases sun protection on 3 principles: avoidance and shade, textile and hats, and use of sunscreen preparations.
1.5. BENEFITS OF OUTDOOR EXERCISE ON CHILDREN

The habits of children in the last 10-20 years have changed considerably, traditional games and time spent outside, are now changing into being inside, sitting in front of their computers and spent the whole day on internet or playing computer games. This current situation is producing adverse effects in the overall development of children, such as increasing obesity in early childhood (Anderson et al., 1998, via Fjørtoft, 2001), and motor problems in children (Due et al., 1991; Hertzberg, 1985; Gilberg & Rasmussen, 1982; Kjos, 1992; Ropeid, 1997, via Fjørtoft, 2001).

Fjørtoft (2001) based in several authors, exposed some statements about the influence of outdoor environments for the general welfare of children. Children’s creativity improved when exercising in natural environments, the absence due to sickness was lower in outdoor kindergartens (Grahn et al., 1997; Söderström, 1998, via Fjørtoft, 2001), and their motor ability showed higher improvements for children having a higher exposure to natural environments (Fjørtoft, 1999; Grahn et al., 1997, via Fjørtoft, 2001).

In his own research, Fjørtoft (2001) assessed 75 children in different kind of kindergartens. The reference group of 29 children was located in a neighboring district kindergarten, which used their traditional outdoor playground for 1–2 hours a day and visited natural sites only occasionally. On the other hand, the experimental group of 46 children was located in a kindergarten near the forest and used their natural resources for play every day during 1-2 hours each day (Fjørtoft, 2001).

The main method used by the author for this research was the EUROFIT (European Test of Physical Fitness), the Motor Fitness Test (Adam et al., 1988, via Fjørtoft, 2001), consisting in the following items: (1) Flamingo balance test, which tests general balance and the participants have to stand on one foot on a platform and the examiner counts the number of falls in 60 seconds of balancing. (2) Plate tapping measures the speed of limb movement and the participants have to tapp two plates alternatively with preferred hand, as quickly as possible. (3) Sit and reach measures flexibility in knee and thigh
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joints. (4) Standing broad jump measures the explosive power of the legs and the participants have to jump for distance from a standing start. (5) Sit-ups measures the endurance of the abdominal and hip-flexor muscles and the examiner counts the maximum number of sit-ups achievable in 30 seconds. (6) Bent arm hang measures upper body relative strength and endurance in arm and shoulder, and the test consists in maintaining a bent arm position while hanging from a bar. (7) Shuttle run measures speed and agility and the participants have to run from the start to the opposite marker, turn and return to the starting line, this is repeated five times without stopping. The author added two tests for his research: Beam walking, for test dynamic balance, in which the participants have to walk the entire length of the beam and back in 30 seconds. The second one, was the Indian skip, which measures cross coordination by clapping right knee with left hand (Fjørtoft, 2001).

The results obtained with this study showed that the experimental group reported more significant differences in all items between the pre-test and post-test than the reference group. Thanks to the relation with natural environments were found some others benefits, such as improvement of motor skills and coordination abilities (Fjørtoft, 2001). According with these findings, the study conducted by Scholz & Krombholz (2007, via Bowler et al., 2010), which compared the motor performance of children from 10 forest kindergartens and from four ‘regular’ kindergartens, concluded that the motor performance of the children from forest kindergartens was superior relative to children from the regular kindergartens.

1.5.1. Different patologies and benefits of contact with outdoor environments for children

1.5.1.1. Myopia

Rose et al. (2008) conducted a study to assess the relationship of different activities, such as near, midworking distance, and outdoor activities with prevalence of myopia in school-aged children. Near work activities are considered these activities which require higher visual effort (e.g., drawing, homeworks, reading, handheld computer use); midworking distance activities are these activities which require high visual effort but
less concentrated than near work activities (e.g. watching TV, playing videogames, computer use); and outdoor activities are these activities practised in outdoor environments (e.g. playing outdoors, family picnics and barbeques, bicycle riding, bush walking and outdoor sports). The authors assessed the refraction and another eye condition of 1765 children of 6 years old (group 1) and 2367 children of 12 years old (group 2) from 2003 to 2005. The participants were subjected to a comprehensive eye examination to determinate refractive status and classified by the following ethnic groups: European Caucasian, East Asian, South Asia (Pakistani, Indian and Sri Lankan), African, Polynesian, Middle Eastern, Indigenous Australian, and South American (Rose et al., 2008).

Several benefits for outdoor environments exposure were found in this research. Less myopia and more hyperopic mean refraction were found with more total time spent in outdoor environments for both groups, group 1 (6 years old) and group 2 (12 years old), and the participants who combined lower levels of near work and higher levels of outdoor activities, obtained the most hyperopic mean. Finally, the assessed factors of myopia were genetic contribution, kind of activity, and ethnicity. The participants whose both parents were myopic, East Asian ethnic, and participated in more near work activities, had the highest probability of being myopic (Rose et al., 2008).

1.5.1.2. Attention deficits in children

According to Barkley (1995, via Taylor & Kuo, 2009), children with attention deficits can do the same work as other children, but the problem is that they can’t maintain the same level of performance the way the most children can.

Taylor & Kuo (2009) conducted a study with 17 children aged between 7 and 12 years old, diagnosed with ADHD (Attention Deficit Hyperactivity Disorder). After children completed a series of puzzles, they walked a 20-minute path in different environments (urban park, downtown, and residential area) every time, supervised by guides. After the walk, the children were driven back to an testing room, where the children completed tests of concentration and impulse control and to assess the post-walk impressions, if the path was fun, relaxing, interesting, scary, boring, weird, or...
uncomfortable. Children’s parents were also asked to complete a short survey to avoid missing data and get some general information about the children (Taylor & Kuo, 2009). In terms of concentration, the results showed that children exposed to a walk along the park, obtained significantly better ranges of concentration after the path, and the effects lasted at least long enough for parents to have noticed them. The authors discovered that the park walk had roughly the same effect to the peak of two ADHD medications, so they suggested the use of natural environments as a mean of enhance attention in children with ADHD, against the use of medicaments. Finally, the authors advised schools about some future implications that will help to the improvement of attention in children, they suggested that schools might include more natural elements in their schoolyards (trees, open lawns, gardens), and included more physical education classes, and environmentally based lessons (Taylor & Kuo, 2009).
2. SUMMARY

DEFINITION AND CLASSIFICATION OF OUTDOOR SPORTS
Outdoor sports are considered every sport that is usually practice in a wild or semi-wild area. Outdoor sports are usually practiced in our leisure time and the main place to practice them is in a nature or semi-nature area, but it is possible to practice them in an urban area as well (Acuña, 1991).

Several authors have classified them:

Acuña (1991) for instance, focused in his classification of outdoor sports upon the environment and techniques we can use while doing it: promotional activities, free activities and organized activities.

Funollet (1995) focused in his classification of outdoor sports upon the practicing, material, and practice space.

Aguado (2001) focused in his classification of outdoor sports upon the environment where the activities are practiced: non-specific activities, specific activities and complementary activities.

Sánchez Igual (2005) focused in his classification of outdoor sports upon the surface where it’s practiced: mountain, water and air.

THE IMPACT OF OUTDOOR ACTIVITIES ON HEALTH
At present, more than half of the world’s population live in urban environments and don’t have too much contact with nature, so some of the substantial mental health challenges facing society and physical challenges arising from modern diets and sedentary lifestyles could be addressed by increased forms of activity in green places (Barton & Pretty, 2010). So the frequent practice of sport in natural environments can improve health status of the population because just to have contact with green spaces can be psychologically and physiologically restorative, reducing blood pressure and stress levels (Mitchell & Popham, 2008). According to Yamaguchi (2006) the aroma of the plants, temperature, humidity, light intensity, wind, oxygen concentration and exercise performs within this environment can improve the quality of life of people.
HEALTH BENEFIT COMPARATIVE BETWEEN OUTDOOR AND INDOOR SPORTS

Outdoor exercise settings had generally higher restorative quality than the indoor ones, because more aesthetically pleasing environments might promote exercise. So these higher restorative feelings improve the overall health status of the population (Hug et al., 2009). For example, people who live in areas with high levels of greenery are three times more likely to be physically active and 40% less likely to be overweight or obese. Furthermore, outdoor activities reported more long-term adherence than indoor activities (Thompson Coon et al., 2010).

ADVERSE HEALTH EFFECTS OF OUTDOOR SPORTS

Live in a free pollution atmosphere is essential for human health, but in the last three decades the world, especially in big cities, is suffering a big environment devaluation, due to emission controls on vehicles, heating, power generation and industry and this progressive devaluation is producing negative effects in groups of people who are especially sensitive to outdoor air toxicants (Curtis et al., 2006). Excessive sun exposure due overtraining and excessive exercise caused negative health effects due the suppression of the immune function, because of repetitive tissue trauma sustained during intense exercise, so this increased the risk of developing skin cancer (Moerhle, 2008).

BENEFITS OF OUTDOOR EXERCISE ON CHILDREN

The habits of children in the last 10-20 years have changed considerably, traditional games and time spent outside, are now changing into being inside, sitting in front of their computers and spent the whole day on internet or playing computer games (Fjørtoft, 2001). It’s very important to engage children with nature from early ages, because that contact will make them improved their creativity; and it is also proved that the absence due to sickness is lower in outdoor kindergartens and their motor ability show higher improvements for children having a higher exposure to natural environments (Fjørtoft, 2001).
3. REFERENCES


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4. RESÜMEE

VÄLISPORDI MÕJU TERVEISELE

VÄLISPORDI DEFINITSIOON JA KLASSIFIKATSIOON


Mitmed autorid on välisporti klassifitseerinud järgmiselt:


VÄLISPORDIALADE MÕJU TERVEISELE

VÄLI- JA SIISPORDI MÕJU TERVISELE
Oma iseloomult on välisport taastavama mõjuga tervisele kui sisesport, kuna välispordi esteetiline vaärtsus mõjutab rohekম selle harrastamist.

Seega kõrgema taastumisväimega kaasnevad tunded parandavad üleüldist elanikkonna tervisliliku seisukorda (Hug et al., 2009). Näiteks inimesed, kes elavad kohas, kus on rohkem rohelust, on kolm korda suurema tõenõosega füüsiliselt aktiivsemad ja 40% väiksema tõenäosusega ülekaalulised. Lisaks on välisport suurem pikaajalise harjumuse tekitaja, kui sisesportialad (Thompson Coon et al., 2010).

VÄLISPORDI KAHJULIK MÕJU TERVISELE
Elu saastamata keskkonnas on inimese tervisele oluline, aga viimase kolme kümndi jooksul maailmas, eriti suurtes linnades, on see l ainud allakäiguteed. Seda tänul heitgaasidele, küttele, energiatootmisele ja tööstusele – selline pidev allakäigutee mõjutab halvasti inimesi, kes on tundlikud õhusaastate suhtes (Curtis et al., 2006). Liigne päikese käes viibimine ja ületreening mõjutavad negatiivselt immuunsüsteemi, kuna korduv kudele trauma intensiivse treeningu ajal suurendab nähavähi tekkimise riski (Moerhle, 2008).

VÄLISPORDI KASU LASTELE
Viimase 10-20 aasta jooksul on laste harjumused suuresti muutunud – varasem rohe vabas õhus viibimine on asendud nüüd istumisega sees laua taga päeva arvutimängide mängides või internesit viibides (Fjørtoft, 2001). Väga oluline on lapsi harjutada loodusega juba varasest kui – see arendab loomingulisust ning haiguse tõttu puudumine on väiksem lastel, kes käivad välilasteaedades ning nende laste mottoone areng on kõrgema tasemeega, kes viibivad rohkem looduslike keskkonnas (Fjørtoft, 2001).