

Original Article

Enjoying natural environments safely: sports, adventure, risk and safeguarding health

ARIO FEDERICI

The University of Urbino Carlo Bo, ITALY

Published online: February 28, 2021

(Accepted for publication February 22, 2021)

DOI:10.7752/jpes.2021.s1056

Abstract

The grim period that we are now living through, marked by the global pandemic, can become a positive impetus for a new culture of physical exercise, sports, and recreational and leisure activities for all ages, reclaiming the great educational and cultural value of combining nature and sport. To be an *ideal outdoor gymnasium* natural environments, with their widely recognized health benefits, should be viewed as a means to educate the individual as a whole. At the same time, in the planning of physical activities and sports in such settings, we must be mindful of the need to prevent injuries and manage risks and dangers. There is clearly a fundamental difference between outdoor activities practiced in a yard or public park and those pursued in natural settings. In the latter case, interactions in the ecosystem between biotic and abiotic factors prevail over anthropogenic factors, and we must strive to strike the right balance between a spirit of free, adventurous discovery of the natural environment and respect for that environment, as well as the safeguarding of individual and collective health. To explore space and time through the body, action and movement, experiencing kinesthetic beauty while immersing ourselves sensorially in nature, to transform information into learning and education into personal growth, a sort of dialectic relationship between the individual and the environment and finally, to reclaim the land through action and movement, moral, spiritual and cultural values through the essential physicality of our body connected to nature while respecting ourselves and others. Based on these principles, the natural environment in every country and all across Europe can become a truly fantastic, varied open air gymnasium, where physical activity, sports and leisure activities can be pursued with no age limits in complete safety, reclaiming and giving meaning to our human condition.

Key words: natural environments, benefits, adventure, physical activity, sports, safety

Introduction

In the past few years a gradual process of ethical-cultural maturation of Western society has led to a growing interest in the pursuit of physical activities and sports in natural settings. On the other hand, this moment in history, marked by the global pandemic and extended lockdowns, has led to a forced reduction in physical activity and reinforced sedentary behaviors within our homes and overbuilt cities. Not being able to go out has, however, led to a greater appreciation of the importance of outdoor physical activity, in particular, in natural settings. This grim period thus has the potential to become a positive impetus for the development of a new culture of physical exercise, sports and recreational and leisure activities for all ages, helping us to rediscover the great educational and cultural value of combining nature and sport.

By *natural environment* we mean a space in which there are interactions between *biotic* (“living”) *factors*, such as flora and fauna, and *abiotic* (“inanimate”) *factors*, such as water, soil, air, the chemical and physical characteristics of the ground and temperature. The complex combination and interaction between these environmental factors and living things form ecosystems (Jones, Robertson, Forbes, Hollier, 1994). Man, with his intrusive activities, is included in this dynamic concept of the environment as an *anthropogenic* factor, and from the very outset, he has altered and disrupted ecosystems through his actions. “The environment stands as an authentic cultural crossroads: it encompasses the traditions of the past and the push towards change in the present, the values of yesterday’s civilizations and those of today” (Frabboni, 1985). “The environment can be defined as the immediate sphere of life, encompassing its natural and social components. Hence, it represents the result of the interaction between life and the aspirations of man” (Mencarelli, 1980).

To provide an appropriate framework for the pursuit of physical activity and sports in natural settings it is important to reflect on the concepts of *territory* and *environment*. In this context, despite the continuous dynamic interaction between man and nature, by “natural environment,” we mean a clear prevalence of biotic and abiotic factors over anthropogenic ones, though clear traces of man may still be observed in such settings. In short, there is a fundamental difference between outdoor activities practiced in a yard or public park and those

pursued in a natural environment, where interactions in the ecosystem between biotic and abiotic factors prevail over anthropogenic factors.

Natural environments, physical activity and sports

Over the past 30 years there has been a significant increase in the number of people who engage in “outdoor” physical activity and sports in natural settings without the aid of equipment, facilities or manmade logistical support. In 2000, data from ISTAT, the Italian National Institute of Statistics, showed that in Italy, well over four million people, or 24% of athletes who practice sports regularly and occasionally, engaged in sports outdoors. Moreover, today in many areas of Italy, sports-centered tourism constitutes an important economic sector, whose annual expansion has only been partially slowed by the pandemic.

To gain a full understanding of the importance of the cultural and social phenomenon of sports-centered tourism in the outdoors and natural environments (Federici, 2001) consider that in 2018, the Italian Outdoor Tourism Observatory counted 245 “athletic disciplines,” or activities considered as such, which are practiced outdoors. The natural environments where such activities are practiced include the sea, lakes and rivers, for a total of 83 disciplines; the mountains, hills, countryside and natural settings, for 29 disciplines; and no fewer than 133 disciplines in multiple mixed settings. A total of 17.6% of the latest and most innovative of these disciplines are not among those recognized by CONI, the Italian National Olympic Committee. The settings where these activities are practiced range from beaches to the mountains, and it is estimated that more than 20 million people engage in such activities regularly or sporadically.

The activities that are practiced the most in natural settings include essential physical movements such as walking (Federici, 2000), encompassing trekking and Nordic walking, slow disciplines that are particularly popular among men and women over the age of 45. These walking enthusiasts prefer non-competitive physical activity in total harmony with the natural environment, which often consists of nature reserves, forests and parks. Such physical activities are performed at a natural pace respecting one’s own physical capacities. They also involve a sort of “sensory bath (immersion) in the forest”, including the observation of wild animals (eg birdwatching), and are sometimes practiced with a few friends or one’s own pet (dog trekking). On the other hand, other physical activities practiced “on foot” in natural settings may be dynamic and demanding, such as cross-country running, trail running etc. Another outdoor athletic activity, which may be performed leisurely or at a high level of intensity, is centered on the bicycle in its various forms (cycling tourism, mountain biking, downhill biking, BMX and marathon biking). Such activities may be non-competitive, performance oriented, with the practitioner seeking to establish new records, or they may simply be viewed as a personal challenge to test one’s own limits.

In addition, in the mountains and foothills of the Apennines, there has been a real explosion of physical activities, particularly among young people. Survival courses, which test one’s ability to survive in a natural environment without any equipment, are especially popular. Likewise, along river valleys, there has been an increase in activities such as “canyoning,” involving descents into gorges using mountain climbing techniques; “hydrospeeding,” i.e. riding the rapids of rivers using specially designed flotation devices; or slower paced activities such as “SUP”, which involves paddling on a longboard. Other activities instead focus on static and dynamic balancing, and involve walking on a rope stretched between two points. The extreme version of this activity, called “highlining,” involves walking across a special rope, approximately five centimeters wide, that is stretched between two points several meters above the ground.

The benefits of physical activity in natural settings

To be defined as authentic *sports* “outdoor” activities performed in the open air and in “natural settings” should be compared and analyzed according to the definition of Article 2, section 1 of the European Sports Charter, in which sport is defined as “all forms of physical activity which, through casual or organized participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels” (Conference of European Ministers, Rhodes, 1992). The quest to improve one’s physical, psychological and social condition thus remains the main aim of sports, i.e. the *safeguarding of the health* of the individual is viewed as the highest individual and collective good, the “*conditio sine qua non*” essential in distinguishing simple physical activity from sport.

The remoteness or lack of green spaces as well as the dearth of specific facilities for sports lead to a reduction in the volume of physical activity practiced by adolescents (Boone-Heinoenen, Casanova, et al 2010). Pretty, Peacock, Sellens and Griffin, (2005) showed how green exercise, defined as the performance of physical activity in a natural setting, is more effective in improving emotional states than physical activity performed indoors. Thompson Coon, Boddy, Stein, Whar, Barton e Depledge (2011) reviewed nine studies using various measures of emotional states (dimensional and categorical models), reaching the conclusion that green exercise fosters positive emotional states (involvement and pleasure) and reduces negative ones (aggressiveness, depression) more than indoor exercise. Hence, physical activity performed in natural settings appears to have a greater impact on wellbeing, yielding reductions in fatigue, while increasing energy, focus, satisfaction, pleasure and the likelihood that the practitioner will engage in the activity again (Thompson Coon et al., 2011; Bowler, Buyung-Ali, Knight, Pullin, 2010). Twohig-Bennett and Jones (2018) published a review

analyzing the health benefits of exposure to green environments with the aim of quantifying the impact of green spaces on health. Their analysis showed that exposure to green spaces is associated with a decrease in salivary cortisol, heart rate, diastolic blood pressure, HDL cholesterol and low frequency heart rate variability (HRV) and an increase in high frequency HRV, as well as a decrease in type 2 diabetes and cardiovascular-related mortality. In addition, a reduction was also found in the incidence of stroke, hypertension, dyslipidemia, asthma and coronary heart disease. Lahart, Darcy, Gildow e Calogiuri (2019) analyzed the effects of green exercise in a review comparing green exercise to indoor exercise, specifically, outdoor running to indoor running on a treadmill, mountain biking to indoor cycling on a stationary bike and indoor versus outdoor resistance training.

They found significant improvements associated with outdoor activities, particularly in terms of stress levels (salivary cortisol, reductions in anxiety and depression, as well as improvements in mental focus and the psycho-emotional relational state. Eigenschenk, Thomann, McClure, Davies, Gregory, Dettweiler and Inglés (2019) investigated and classified the benefits of outdoor sports.

Their research included:

- activities that are normally performed in close relationship with nature and landscapes;
- activities in which the natural environment is perceived by practitioners and only minimally modified by humans;
- activities that require physical strength;
- activities based on the ability of man to use natural elements;
- activities in which equipment or non-motorized means (surfboards, bicycles, skis) are used, bringing into play the body and movement.

Examples of activities that fall within these parameters include hiking, trekking, swimming in natural bodies of water, mountain biking, snowshoeing, cross-country skiing, canoeing, surfing and rock climbing. Outdoor sports are associated with numerous benefits, including generally improved fitness, greater cardiovascular efficiency, lower blood pressure and heart rate as well as reduced obesity. All these benefits mean a reduction in the risk for several pathologies, including cardiovascular disease and type 2 diabetes. Moreover, these outdoor sports are associated with improved overall health and better quality of life. Several studies have also shown the positive effects of outdoor sports on mental health and psychological stability. Furthermore, evidence has been provided pointing to the positive effects of outdoor sports on overall wellbeing, quality of life, satisfaction with one's life and happiness. In general, it appears that engaging in physical activity in natural environments and near bodies of water (the sea, a lake) has more positive effects than engaging in the same activities in non-natural settings. The studies analyzed in the review report the positive effects of outdoor exercise on mood, and its ability to enhance resilience, renew, foster positive commitment and provide a sense of restoration for city dwellers. Moreover, engaging in sports outdoors appears to reduce negative emotions, such as stress, depression, anxiety, tension, confusion, aggressiveness, solitude and neurosis while fostering positive experiences, such as pleasure and fun, meditation, independence, autonomy, better social relationships, a sense of reassurance, intense emotions, greater awareness of one's own body and the attainment of goals. All of these effects lead to higher self-esteem, self-efficacy, greater self-confidence and an overall more positive vision of ourselves.

Not only are outdoor sports useful in preventing mental disorders, but they can also be effective in treating such disorders. They can help in the treatment of Alzheimer's, senility and most forms of depression. Outdoor sports are also used as a therapeutic tool for the disabled. Hansen, Jones and Tocchini (2017) published a study on the art of Shinrin-Yoku (SY), a Japanese practice that consists in walking freely in a forest, literally "forest bathing", a term coined by Tomohide Akiyama in 1982, reflecting the physiological and psychological effects of the practice.

The results of the study show that, among the therapeutic effects of SY, it has positive effects on:

- the immune system;
- the cardiovascular system;
- the respiratory system;
- anxiety and depression;
- mental relaxation;
- gratitude and altruism.

Shinrin-Yoku can be considered a form of natural therapy. For the environment and the fantastic world of nature to become effective teaching tools they must be offered and explored by the individual, whether they be a child, adult or elderly subject, through their own body, through movement, the action and search for the those coordinated movements, intentional acts that in the context of natural environments reveal their true original purpose, their spontaneous "effectiveness" as movement patterns constituting the basis of human movement. Walking, running, jumping, climbing and rolling mean freely exploring natural settings through the physicality of our own bodies, and at the same time, nature itself reveals the true purpose and justification of these innately human movements (Federici, 1993).

Enjoying the environment safely

The natural environment, providing a setting for countless activities, exposes us to a wide range of spatial situations, an extended varied space, as we constantly face a variety of challenges that require immediate action. Engaging in physical activity and sports in a natural setting means developing abilities related to the sensory-perceptive functions that rapidly process incoming stimuli and information. It is the special direct physical contact with natural elements, the ground, the grass, the sensation of the wind on our face, the trees, the sun, the air, cooling off in a stream, the discovery of colors, listening to the sounds and voices of the forest and the silences, that fosters our appreciation of the joy of “being” and the experience of inhabiting a “living body” (Federici 1998). To nurture and develop a spontaneous attraction to nature in children, they must be allowed to “discover the natural environment” through their bodies and senses. Being immersed in this true sensorial bath, discovering nature with their bodies, will foster a different kind of spatial awareness and “adventure”, not the simple allure of outmoded activities and gratuitous risk, but rather a sense of thoughtfulness and responsibility for their own choices, an awareness of their own limits and an understanding of their own actions while maintaining a healthy respect for themselves, others and the environment (Federici 2015).

The increase in the number of practitioners and those striving for extreme experiences without adequate knowledge and preparation has led to a significant increase in injuries and accidents. Indeed, we must not empty the cities to fill the meadows and woods with hordes of people seeking “easy emotions,” exploiting the natural environment as a mere commodity. Indeed, if those who engage in physical activity and sports in natural settings are not grounded in a culture of self-respect, respect for the environment and nature, the whole purpose of the experience is negated.

The distinctive feature of our educational initiative highlights the importance of “effectiveness” and “safety” in physical activity and sports in building healthy life-long habits. All too often there are reports of individuals engaging in activities or sports in natural settings with a certain superficiality, inexperience and carelessness, often leading to serious accidents and injuries. In these cases, which may even have tragic consequences, fate is often blamed when the real culprit is negligence, the underestimation and ignorance of the risks involved or the lack of a clear, judicious plan for the activity. The vastness of natural environments, the particular nature of some disciplines and the exuberance of new practitioners mean that we find ourselves before a set of multifaceted complex elements and variables, and the instructor must have the specific knowledge, skills and abilities to make sense of these intertwining factors. In Italy, nearly 43.8% of accidents occurring in natural settings are hiking-related, often involving older hikers in the 45-65 age group; 16% occur in downhill or cross-country skiing and 6 % in mountain biking. Slipping and falling account for nearly 46.2 % of accidents, 26.1 % are attributable to incompetence, 12.3% can be attributed to illness, 4.3% to bad weather, 0.6% to avalanches and anaphylactic shock (The National Alpine and Cave Rescue Corps 2019).

With its pristine landscapes, clean air and stunning views, Switzerland, like Italy, cherishes mountain sports, which are among the most popular free time activities. Overall, the highest number of fatal accidents occur in hiking and trekking. These two sports have grown more popular in the past few years, and over half of the Swiss population goes on at least one hike a year. From 2010 to 2019, a total of 582 people lost their lives in hiking accidents, while in the previous decade there were only 459 victims. A reverse trend can be observed in mountain-climbing. In this sport the number of fatal accidents has dropped from 333, 20 years ago, to 238 in the last decade (UPI 2020). For over 20 years the Swiss Office of Injury Prevention has played a crucial role in monitoring accidents and injuries in sports while fostering prevention and public education.

Getting used to living with risks is something that is very difficult to accept from a psychological standpoint, especially if one is engaged in sports, recreational or other leisure activities, often perceived as playful and enjoyable and therefore risk free, but it is absolutely indispensable to be familiar with and understand the potential dangers we are exposed to if we wish to reduce those risks and dangers in a meaningful way.

By danger we mean that intrinsic quality or property of a given entity having the potential to cause damage. The most significant dangers in natural environments are: water, fire, animals, atmospheric conditions, and the type of abiotic and biotic factors present in an environment. By risk, on the other hand, we mean the “probability” that the potential damage level is reached under conditions of use or exposure, as well as the scale of the possible damage. Injury, defined as a traumatic event produced by violent causes or occurring accidentally during a sports or leisure time activity, is often not attributable to just one cause, but is the result of a negative series of circumstance originating from objective and subjective factors. Briefly, objective factors include disorganization and inadequacy of the activity, materials and equipment. Subjective factors include ignorance, i.e. not being familiar with the biotic and abiotic elements that characterize a natural environment and the particular interaction of those elements, which may have a profound negative impact on the physical activity. For example, a clayey soil on a steep slope under damp conditions can become a real trap for dangerous slipping. Moreover, to prevent injuries one must have an adequate level of physical, athletic and technical preparation for the activity that one intends to engage in. We must therefore consider the age of the learners, their health status, their psycho-physical training and technical skills as well as their motivation and educational and athletic goals. In the case of group trekking, groups that are heterogeneous in terms of fitness levels or the fragile psycho-physical condition of even just one member of the party can have dangerous consequences. Among the most serious subjective factors, there is *negligence*, i.e. neglecting or failing to fulfill one’s duties, inattentiveness and

insufficient caution with regard to one's own duties and the rights of others. Other subjective factors include *incompetence*, i.e. lack of expertise or practical experience with regard to techniques that one should be familiar with, and *recklessness*, i.e. disregard for danger and excessive self-assurance compounded by inattention and negligence (Federici, 2004).

The "Precaution Principle" is therefore useful to effectively reduce risks and to help the instructor avoid negligent behavior. If a "relationship of material causality of the event" is recognized, i.e. a link between "cause and effect," between negligence and its result or consequence, legal actions may be pursued. Prevention is thus meant as a set of measures that allows us to reduce and avoid risks during physical activities and sports, a way to safeguard the health and lives of the subjects engaged in the activity and the environment, which are viewed as the greater good and patrimony of the individual and society. Prevention is achieved through a systematic analysis of the various aspects of the activity that we intend to perform and the places where it will be carried out.

Briefly, a risk assessment includes the identification of causes of accidents; an estimate of the probability or frequency of those accidents; and an appraisal of the consequences or seriousness of potential accidents. In the case of particular activities (high altitude hiking, trekking, ski-mountaineering, rafting, rock climbing, water activities) local knowledge should be sought, drawing up risk maps and collecting reliable information from entities such as CAI (the Italian Alpine Club), the Civil Defense Corps, Park Services, the Forest Police Corps and Alpine Rescue Corps. The guiding principle of our interventions as instructors to reduce accidents will aim to optimize three essential factors:

- a) having learners assume a sense of responsibility;
- b) knowledge of the environment;
- c) the choice of activities and equipment.

Preventative, direct, indirect, moral and emergency assistance, traditionally provided in gymnasium limited areas, will of course be applicable, though amplified in terms of their educational-pedagogical value, to exercises and activities performed in natural environments in vast heterogeneous spaces with greater organizational complexity. But how can we constructively foster a spirit of adventure and active participation in the learner through free will, freedom of action and safety? To ensure that students consciously acquire healthy lifetime habits (whether we are dealing with children or adolescents, adults or the elderly, novices or athletes) we will seek to foster individual autonomy and personal responsibility through practical and simulated physical activities based on the subject's age and fitness level.

Conclusions

Activating a process of cultural, ethical, values-based, moral knowledge, grounded in expertise and skills in the field of physical activity and sports, through a combination of actions and information related to the challenges that are faced in natural settings in terms of risks and safeguarding health, will foster self-education and personal responsibility. It is important to involve the learner in the planning of various activities, bringing to life a "sense of adventure and discovery and of being the architect of that experience" (Federici, 1993) in the actual implementation of the plan. This will mean having learners who are always motivated and interested in learning, while the instructor must always strive deontologically for maximum safety through effective planning and appropriate support according to the age of the learners. All of this will prepare us to deal with risky situations, including unforeseen risks, fostering self-control, rational responsible behavior, self-confidence and emotional control.

Hence, we seek to explore space and time through the body, action and movement, experiencing kinesthetic beauty while immersing ourselves sensorially in nature, to transform information into learning and education into personal growth, a sort of dialectic relationship between the individual and the environment and finally, to reclaim the land through action and movement, moral, spiritual and cultural values through the essential physicality of our body *connected* to nature while respecting ourselves and others. Based on these principles, the natural environment in every country and all across Europe can become a truly fantastic, varied *open air gymnasium*, where physical activity, sports and leisure activities can be pursued with no age limits in complete safety, reclaiming and giving meaning to our human condition.

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