

FOREST ADVENTURE PARKS OF ROMANIA: NEW POSSIBILITIES TO DEVELOP THE HUMAN PHYSICAL CAPACITY

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ABSTRACT. One of the primary goals of physical education is to improve the human physical capacity. The physical capacity is a dynamic potential of a person, which is composed by the level of motor abilities and motor skills acquired during life. School-based physical education plays an important role in the development of motor capacity, but it is by far not enough to achieve the goal of physical education. **Purpose:** The purpose of this study is to map the adventure parks of Romania and to examine (by reviewing the literature) the effect of climbing on the motor capacity of the participants. We would like to examine the most common obstacles in adventure parks and determine what physical abilities are needed to complete them. **Case Presentation:** In Romania, the first forest adventure park was built in 2006 and by now, their number has reached thirty. Their main characteristic is that the climbers, by relying on their own physical and mental abilities, try to cross obstacles of various difficulty, height and length. **Conclusions:** Moving activities provided by forest adventure parks have become easily available to more and more people. Climbing in adventure parks (and climbing in general) can be an excellent alternative to improving motor capacity, as it uses and develops the body in a versatile way.

Keywords: *adventure park; climbing; physical benefits; motor skill, rope courses.*

REZUMAT. *Parcurile de aventură din România: noi posibilități pentru creșterea capacității motrice a omului.* Unul dintre obiectivele primare ale educației fizice este dezvoltarea capacității motrice. Capacitatea motrică este un potențial dinamic, compus din nivelul de dezvoltare al calităților motrice și deprinderilor motrice. Educația fizică școlară are un rol important în dezvoltarea capacității motrice a elevilor, dar nu este suficientă pentru atingerea obiectivelor educației fizice. **Scop:** Scopul acestui studiu este prezentarea parcurilor de aventură din România și de a descrie (prin studiul literaturii de specialitate) efectul cățărării asupra capacității motrice. Am dori să descriem cele mai comune

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obstacole din parcurile de aventură și să determinăm acele calități și deprinderi motrice care se implică în cățărare. **Rezultate:** În România, primul parc de aventură forestier a fost construit în 2006 și până acum numărul lor a ajuns la treizeci. Principala lor caracteristică este că cățărătorii, bazându-se pe propriile abilități fizice și mentale, încearcă să traverseze obstacole de diferite dificultăți, înălțimi și lungimi. **Concluzii:** Activitățile motrice oferite de parcurile de aventură forestiere au devenit accesibile pentru tot mai mulți oameni. Cățărarea pe traseele cu obstacole (și cățărarea în general) poate fi o alternativă excelentă pentru îmbunătățirea capacității motrice.

Cuvinte cheie: *parc de aventură; cățărare; beneficii fizice; deprindere motrică.*

Introduction

In the public schools of Romania, there are two physical education (PE) classes per week at elementary and middle school level, and just one class of PE per week in secondary schools. School-based physical education plays an important role in the development of motor capacity, but it is by far not enough to achieve the goal of physical education. In addition to the few hours of physical education, in many cases even the material and didactic conditions are very weak and underdeveloped. One of the primary goals of physical education is to improve the human motor capacity (Mitra & Mogos, 1980). Motor capacity is defined as the dynamic potential of a human that is formed by the level and quantity of motor skills and motor abilities acquired during life. Dynamic potential as it expands through the learning of unknown skills or narrowing by forgetting skills (Cârstea, 1999).

It is also an important role of the school physical education to prepare the individual for independent out-of-school physical activities. If we succeed to create a lust in the individual for the physical activity, we are halfway to achieve an important role.

Regular physical activity is required to maintain the optimum fitness level of the human body. However, in order to develop the motor capacity on various way, we should not stop at a kind of activity, it is best to have a diverse training program, which is changed or adapted. Regular physical activity (also the non-regular physical activity (O'Keefe, 2012)) has a wide range of beneficial effects on the human body, which has been proven by thousands of studies (Janssen & LeBlanc, 2010), but there are still some new and surprising facts in the new studies.

Climbing is a motor activity that occurs through the joint work of the lower and upper limbs on vertical or steep surfaces. It is a complex form of movement that we start learning when we are 2-3 years old (Hébert, 1912). Climbing is usually done on a solid, stable surface, which can be a rock wall, a tree, a climbing wall or on a very mobile rope. In contrast, in a forest adventure park, we encounter a particular form of climbing, obstacle climbing. In many cases, obstacle climbing occurs on unstable surfaces, which are not always vertical surfaces, they are hanging objects and this position makes climbing more difficult. Occasionally, the climber may be in a support, hanging, lying or even kneeling position. Due to the diversity of climbing, it affects the human body in many ways and we can benefit from its favorable effects.

Objectives

The aim of this literature review study is to map the adventure parks of Romania and to describe the effect of climbing on the motor capacity of the participants. We would like to examine the most common obstacles in adventure parks and determine what physical abilities are needed to complete them. In addition, we would also examine what kind of motor skills are necessary during obstacle climbing.

Forest Adventure parks and rope courses

Forest Adventure Park began to spread relatively recently (from the mid-twentieth century) as a recreational activity for society (Wagstaff). There are currently several names that refer to the same or similar activities: rope courses, rope challenge courses, aerial obstacle courses, challenge courses, aerial adventure park, Tree-Top Adventure course. The simple ground obstacle courses can be considered the ancestor of the adventure parks, which have been used for a long time in training soldiers. It seems, that Georges Hébert was that person who recognized the importance of the obstacles and obstacle courses, and made efforts to include them in the PE activity (Hébert, 1912). He included such obstacles which requires walking, running, jumping (up, down, over), hanging, climbing (rope, pole, tree, wall), balancing, brachiating, carrying, throwing exercises.

The Outward Bound movement in Aberdovey, Wales (Parker, as cited in Attarian, 2001), built the first obstacle course for educational and recreational purposes. Originating in the United Kingdom, this movement has prospered in

the United States since 1962 (Attarian, 2001; Neill, 2004). Initially (for nearly 30 years), builders built their courses and obstacles according to their own insights and ideas. From the 90s onwards, it is only possible to build and operate courses under supervision and regulation in accordance with strict regulations. This made the courses much safer; by the way, these can be operated only by trained staff and their condition is checked periodically (Attarian, 2001).

In the forest adventure parks, we can find a diverse obstacle course type, which uses the motor abilities of the climbers in a versatile way. One of the main characteristics of the courses is that they are stretched the trunks or branches of the living trees. Another characteristic is that the climber is constantly in safe, because of the safety equipment he wears. In the majority of parks, this safety equipment is composed by a helmet, a harness and a pair of gloves. The harness and the helmet are must-have accessories, but the gloves are just recommended.

In Romania, the first forest adventure park was built in 2006 (Grigore, 2006). In the past 13 years, their number has reached thirty. Their main characteristic is that the climbers, by relying on their own abilities (physical and mental), try to pass-over obstacles of various difficulty, height and length. Most of the Romanian adventure parks have been built near major cities, but we can still find county seats that are missing these parks. The map in Figure 1 shows the currently operating adventure parks divided by counties.

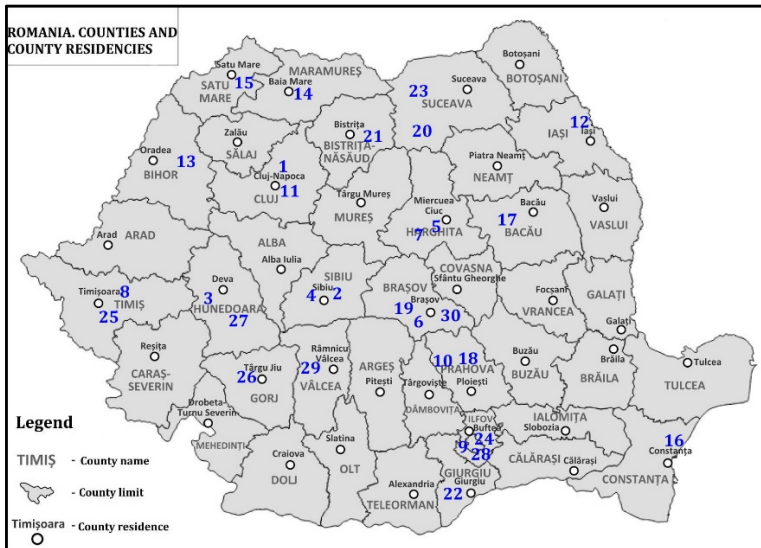


Figure 1. Location of Romania’s forest adventure parks by county
Adrenalin Park, Casele Micești, Cluj

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| 1. Arka Park, Păltiniș, Sibiu | 18. Parc Aventura, Brasov |
| 2. Arsenal Parc, Orăștie, Hunedoara | 19. Parc Escalada, Gura Humorului, Suceava |
| 3. Aventura Parc Drăguș, Sibiu | 20. Parcul de Aventura Cocoș, Bistrița, Bistrița-Năsăud |
| 4. Balu Park, Hargita Băi, Harghita | 21. Parcul de aventura Comana, Giurgiu |
| 5. Cheile Grădiștei, Brașov | 22. Parcul de aventura Fălticeni, Suceava |
| 6. Club Aventura, Salina Praid, Harghita | 23. Parcul de aventura Herăstrău, Bucuresti |
| 7. Domeniul Herneacova, Herneacova, Timiș | 24. Parcul de Aventura Nădrag, Nădrag, Timiș |
| 8. Edenland Park, Balotesti, Ilfov | 25. Parcul de aventura Rânca, Novaci-Romîni, Gorj |
| 9. Escapade Adventure Park, Sinaia, Prahova | 26. Parcul Gurasada, Gothatea, Hunedoara |
| 10. Geko Park, Sălicea, Cluj | 27. Phoenix Extrem Park, București |
| 11. Hamak, Bârnova, Iași | 28. Vatra Parc, Nicolae Bălcescu, Vâlcea |
| 12. Happy Land Adventure Park, Stâna de Vale, Bihor | 29. Wolf Park Adventure, Zărnești, Brașov |
| 13. Jungle Park, Baia Mare, Maramures | |
| 14. Jungle Park, Satu Mare, Satu Mare | |
| 15. Paradis Land, Neptun-Mangalia, Constanța | |
| 16. Parc Aventura Magura, Bacău | |
| 17. Parc aventura Cumpătu, Sinaia, Prahova | |

If we take the regional division of the country as the basis, most adventure parks (12) are found in Transylvania. Muntenia follows this region with six adventure parks; three of them are in or near the country capital, Bucharest. There are 2-2 adventure parks in Banat, Moldova, Maramures, Bukovina and Oltenia, and 1-1 adventure parks in the Crisana and Dobrogea regions. It is worth to mention, that the Club Aventura Park is located in a transformed salt mine.

Climbing as the most used motor skill in forest adventure parks

Climbing takes place through the joint work of the lower and upper limbs. It is a complex form of movement that is learned at an early age (Cârstea, 2000). According to Hébert (1912, p.58) "Climbing consists in raising or moving the body using the arms or the arms and legs from a suspension or a holding position. It is one of the most useful practical exercises: climbing is important in many different situations from reaching a high place to passing an elevated obstacle to fleeing from danger vertically."

Why do children climb? According to Frost, Brown, Thornton and Sutterby (in Frost, 2013, p.8) “children climb for fun, enjoyment, challenge, the sense of danger, and to access the top for success and observation. They climb to explore, gain new perspectives, access play options, play chase, engage in make-believe play, respond to parent and peer challenges and encouragement, and to compete with peers”.

We can say that climbing (we are now referring to obstacle climbing) is a complex motor activity, because during the time we want to get up or forward on the obstacle, we have to control accurately the movement of our limbs, keep focusing, keep our balance, make good decisions, sometimes to overcome our fears, to trust in our abilities, to convince ourselves to try again after a fail, etc.

Although the biomechanics of climbing types are largely the same, but depending on the surface or the (protective) equipment we use, we can name more than 20 kinds of climbs: bouldering, buildering, canyoneering, chalk and ice climbing, free climbing, indoor climbing, ladder climbing, lumberjack, mountaineering, pole climbing, traditional climbing, tree climbing, tower climbing (Wikipedia, 2019). These types of climbing influence the musculoskeletal and functional systems in different ways.

The level of motor capacity may increase from several sides due to the (obstacle) climb. At first, we would like to describe the motor abilities that are used in this activity:

- The dynamic force of the arm, leg, and muscles of the trunk.
- The activity takes place for a relatively long time (90-180 minutes), therefore, the endurance strength of the body parts can be improved.
- Occasionally, with great effort, quick movements (jumps, brachiating, pull-ups) must be carried out so the explosive strength of some body parts is also improved.
- The obstacles are almost always mobile, so the dynamic balance of the climber is continuously used.
- The parts of the obstacles are also moving, making it difficult to catch them. As a result, the spatial orientation of the climber and the eye-limb coordination also develops.
- Occasionally, you need to catch obstacles with fast movement, so the limb or movement speeds also developed.
- By climbing, we can increase the mobility of the shoulder and hip joints.
- Because we use sensitive opening-type carabineers, fine motor skills are also developed.

Obstacle climbing on obstacle courses helps the participants to learn or to perfect some motor skills such as:

- climbing (on: rope, tree, rope net, obstacle, climbing wall)
- crawling (on: abdomen, back, side)
- brachiating (on: ladder, rope)
- jumping and walking types.



Figure 2. Girl on a low obstacle doing a cross split

Benefits of (obstacle) climbing

Physical Benefits

Forest aerial ropes courses are generally considered to be fun and adventurous. Visitors are more likely to visit them for relaxation than for the health benefits of climbing activity (Deane, 2018). Because we encounter hundreds of thousands of different obstacles in an adventure park, they will use the skeletal muscles and joints of our body in different ways and intensities.

During climbing, although the upper as well as the lower limb are involved in the movement, the upper limb and trunk muscles are used more. Obstacles must be caught, pulled, held. We must keep our own weight partly or wholly in hanging or support position. The most used muscles in obstacle course climbing are biceps brachii, brachialis, triceps brachii, pectoralis major, latissimus dorsi, serratus anterior, rectus abdominis, etc. We have mentioned these muscles and body parts, but we can be sure that “but you will also use many of your body’s often overlooked muscles while completing a high ropes course” (Skywalker, 2018).

Perhaps, one of the most used motor ability while climbing on obstacle courses is the balance, especially its dynamic type. The dynamic balance is our ability, which is responsible for not falling during motion and movement. The other type of balance is the static balance, which is responsible for keeping the postures without movement (Panjan & Sarabon, 2012). Both have an important role to play in everyday life, because they are alternately responsible for maintaining body balance. Obstacle climbing takes place on ropes stretched between trees or on hanging obstacles, which always move during the climb, providing a truly unstable base.



Figure 3. Climber on a mobile obstacle, which requires force

Effects on cardiovascular system

Obstacle climbing have a significant impact on the cardiovascular system, because during this activity the effort is from medium to high intensity (Watts, et al., 1999). Heart rate increases significantly during climbing, on the one hand due to the muscle work, on the other hand due to the risk factors (height of the course, unstable obstacles, fatigue). Usually, the courses are 3 to 12 meters above ground level, but you can also read about tracks at 25 meters (for example in pine Forest, in Sinaia). The heart rate is also partly dependent on how fast the climber wants to finish an obstacle or course. If someone's goal is to perform as quickly as possible, it is normal to have much higher heart rate values.

Watts et al. were the first to investigate the physiological effects of obstacle climbing on a 20-person group. They built a five-part obstacle course, 20 feet (about 6 meters) above the ground. The length of the obstacles was 30 feet each (about 10 meters). The group needed an average of 11.18 ± 2.88 minutes to finish the obstacles. The average heart rate was 142 ± 16 , and the energy demand per minute was 5.12 ± 0.91 (kcal*min⁻¹). During the effort, the oxygen demand was also measured, and its average value was 13.9 ± 2.3 (ml * kg⁻¹ min⁻¹). The Metabolic Equivalent of Task also has been calculated. Its average was 4, which is a medium intensity activity, however, on some obstacles a 6-7 score has reached, which is a vigorous intensity activity.

Frost (2013, p.9) states, "climbing playground equipment, trees fences, and other objects promotes strength, confidence, vestibular stimulation, perceptual-motor skills, creativity and neuromuscular development".

The various exercises involved in rock climbing can aid in the prevention of chronic illnesses, such as heart disease, high blood pressure, high blood cholesterol and diabetes (Nunan, Mahtani, Roberts, & Heneghan, 2013). The Centers for Disease Control and Prevention said rock climbing was a vigorous and intense physical activity and because of its health benefits in reducing stress, cardiovascular activity and building muscle, rock climbing can decrease the risk for various chronic illnesses (Rockreef, 2017).

Psychological benefits

Many people, who has not yet tried to climb, are afraid of starting the climbing and doubting in their own abilities. Because in the adventure parks have different levels of difficulty, climbers with weaker abilities also can succeed, thus experiencing the joy of overcoming the obstacle and the growth of self-confidence. Skywalker (2018) says that obstacle climbing is a "fantastic boost of self-esteem." They can gain self-confidence, self-esteem, self-knowledge and self-image, which can be taken with them in their daily life and can be utilized at work and in social situations. Willig asked rock climbers and concluded that the climbers "experience a state of being similar to individuals who meditate" (as cited in Steinberg, 2011, p.74). Steinberg studied novice and experienced rock climbers in his 2011 study and found "that mindfulness and psychological well-being are correlated with the activity of rock climbing (p.75)."

Climbers must overcome their various fears. There are those who are afraid of the height, in this case the safety equipment is of great help, which allows the wearer to climb to any height without any risk. This equipment can provide security for the fearful wearer. Fear of failure can be overcome by the fact that the climber can move forward on the courses starting with the simplest obstacles, gaining a sense of success, so the climber can start boldly harder courses.

Benefits of climbing for toddlers

By 18 months, a normally developed toddler could climb a chair, and by two years old, he may be able to climb on to furniture to look out of a window. These types of physical challenges can help the toddlers to grow in body and mind. Climbing develops their coordination, besides muscle and bone strength (BabyCenter, 2013).

According to Wentworth (2018), there are many benefits for young children from climbing, which they put together in five points:

(a) Through climbing toddlers develop their dexterity, which can be transferred into the classroom and used when they will learn to hold a pen or a pencil while handwriting.

(b) By practice, toddlers will learn to face their fears regarding climbing, harder obstacles and altitude. A climbing confidence will be achieved by taking on new climbing challenges in the subsequent days.

(c) Their upper body strength will improve with regular activities.

(d) Also, their problem-solving skills will develop, because a critical thinking mode should be used in climbing, decisions with consequences are made.

(e) There is a risk in climbing activities, because climbing is risky. Beginners frequently fall a few times before reaching their goal. Children can injure themselves, can fracture their bones. The good news is, that they can become experts by practice, and a child with experience can “manage and assess risk which is an important life skill to learn from young age” (Wentworth, 2018).

If sufficient playtime is provided “for children to develop their natural intuition for protecting themselves in increasingly risky play” (Frost, 2013, p. 11). They can learn to protect themselves during fall like an athlete who practicing wrestling, gymnastics or parkour.

Climbing a wall, a tree or an obstacle requires focus and concentration. If children want to progress, they need to pay attention for every single part of their climbing activity. After the initiation phase, they work together one with others, and “they are responsible for someone else’s life” (HighSports, 2016).

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Conclusions

As we have seen, about 30 adventure parks have been built and are operated in Romania in the past 13 years. A significant part of these parks was established near metropolitan agglomerations. Their disposition is not uniform, most of them are located in Transylvania and especially in the vicinity of big cities like Cluj-Napoca, Braşov, Sibiu.

Climbing can greatly contribute to improve motor capacity, because obstacle climbing develops up to 7-8 subspecies of motor abilities (especially strength, endurance and joint mobility) during a two-hour climbing session. The most practiced motor skills are the different types of climbing, but in some situations, the climber needs to crawl, to brachiate or to jump from obstacles.

In the past 2-3 decades, adventure parks and climbing activities have attracted the attention of researchers, leading to studies, which assessed the physical, psychological and social effects of obstacle climbing.

Climbing can produce beneficial functional effects on human body. We believe that the caused beneficial mental effects are at least as important as the physical ones. They can help us overcome our fears, give us self-confidence, give us a sense of success, stress relieving, help improve your self-awareness, and help to build a proper self-image.

Climbing can begin at a very young age (2-3 years) and can be practiced until old age. By now, there are many varieties of climbing and a great advantage is that everybody can find the right difficulty for themselves.

Conflict of interest

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