STUDIA UBB EDUCATIO ARTIS GYMN., LXV, 1, 2020, pp. 45 - 54
(RECOMMENDED CITATION)
DOI:10.24193/subbeag.65(1).05

THE PREVALENCE OF CLIMBING ACTIVITIES IN 11-15 YEARS OLD CHILDREN FROM ROMANIA. A CROSS SECTIONAL PILOT STUDY

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A**BSTRACT.** ***Introduction*****:** Climbing consists in raising or moving the body using the arms or the arms and legs from a suspension or a holding position...climbing with the arms and legs recruits the muscles of the entire body, in particular the core and upper limbs. ***Objectives:*** Our primary goal is to find out how often the subjects from Romania are engaged in climbing activities and what the most popular types of climbing are. ***Methods:*** Throughout the school period of March 4, 2019 to March 11, 2019, 83 (46 boys with a mean age of 12.84±1.24, and 37 girls with a mean age of 12.83±1. 23) children were examined. 68.7% of the children were urban residents and 31.3% were rural residents. ***Results*****:** On a weekly basis, 14.5% of respondents experience some form of climbing. The 64% of respondents say that their school gym has equipment (rope, rod, ribbed wall) that is suitable for practicing climbing. 89.2% of respondents have been climbing a forest adventure park at least once. However, 30% of these have been at least 5 times and another 35% 3-4 times in an adventure park. ***Discussion:*** Climbing is a movement skill that needs to be taught. Its teaching is prescribed in current and older Romanian school curricula. The teaching of its simpler forms in almost every school could be possible by a physical educator or teacher. It would be important to teach and practice as it has many benefits for children, as studies have shown. ***Conclusion:*** The interviewed children have already tried several types of climbing, among which tree climbing dominates. Of the climbs which use safety equipment, indoor and obstacle course climbs are more common.

Keywords*: climbing, obstacle climbing, ropes challenge course, physical activity.*

REZUMAT. ***Prevalența activităților de cățărare la copii de 11-15 ani din România: un studiu pilot transversal. Introducere:*** cățărarea constă în ridicarea și deplasarea corpului folosind doar brațele sau simultan membrele inferioare și superioare dintr-o poziție suspendată. În cățărare sunt angrenați toți mușchii corpului, mai ales ai brațelor și ai trunchiului. ***Obiective:*** obiectivul

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principal al acestui studiu este de a afla cât de frecvent sunt implicați subiecții din România în activități de cățărare și care sunt cele mai populare tipuri de cățărare. ***Metode:*** în perioada 4 martie 2019 - 11 martie 2019, au fost examinați 83 de copii (46 de băieți cu o vârstă medie de 12,84 ± 1,24 ani și 37 de fete cu o vârstă medie de 12,83 ± 1,23 ani). 68,7% dintre copii erau din mediul urban și 31,3% din mediul rural. ***Rezultate:*** 14.5% dintre copii practică cu frecvență săptămânală cel puțin o formă a cățărării. 64% dintre ei au răspuns că sala lor de sport este dotată cu diferite echipamente pentru practicarea cățărării (frânghie, bară, spalier). 89.2% dintre copii au fost deja într-un parc de aventură forestier. ***Discuții:*** cățărarea este o deprindere motrică care trebuie învățată. Predarea acesteia a fost și este prevăzută în programele școlare actuale și cele vechi. Învățarea formelor simple ale cățărârii ar putea fi posibilă de către un profesor de educație fizică sau de învățătoarele claselor primare. Practicarea acesteia ar fi importantă, deoarece are numeroase beneficii fizice pentru practicanți, așa cum au arătat unele studii. ***Concluzii:*** copiii intervievați au încercat deja mai multe tipuri de cățărare, printre care domină cățărarea pe copaci. Dintre acele tipuri care folosesc echipamente de siguranță sunt mai frecvente cățărările la sală și cele pe obstacole în parcuri de aventură.

Cuvinte cheie: *cățărare, cățărare pe obstacole, parc de aventură forestier, activitate fizică.*

Introduction

Climbing is a basic movement activity of the humans, which can be started to learn at the age of 3-4 (Davis, 2017). Some types of climbs may be as old as humanity. It's hard to imagine how living outdoors could have happened without climbing. In our developing world, for many of us, climbing is present in our daily lives as a sport or recreational activity, and less as an essential tool of subsistence. Although in some jobs (mountain rescue, firefighting, certain types of construction, sports, etc.), even daily exercise is required. Climbing is a motor skill that we learn throughout life. Because there are many types of climbing (Wikipedia, 2018), everyone can find the appropriate type for themselves, depending on their age, readiness and strength. The most common surfaces on which we can climb are solid, stable surfaces, such as a rocks, trees, in- or outdoor climbing wall, or even a rope. In contrast, on ropes courses, we encounter a different form of climbing, namely 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. (Balla & Boros-Balint, 2019)

According to Herbert (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... climbing with the arms and legs recruits the muscles of the entire body, in particular the core and upper limbs." The Collins English Dictionary (2012) defines climbing as a physical activity as follows: "to ascend, go up, or get to the top of, especially by the use of the hands and feet or feet alone or by continuous or strenuous effort".

Climbing could be considered as a difficult physical activity, because the energy demand can exceed 10 MET, which can mean 660-820 kcal/h energy demand. Watts et al., (1999) studied the energy expenditure of rock climbers in a variety of settings, with average energy expenditure values for outdoor climbers recorded at ~10–11 kcal/min of climbing. During training and competition, energy expenditure can vary depending on the type and difficulty of climbing (Dickson, Fryer, Blackwell, Draper, & Stoner, 2012). Numerous studies have been published on the physical effects of different types of climbing, but we will not begin to describe them now.

In a 2017 study by Siegel & Fryer, we can find some data regarding the frequency of climbing in children and adults. In fact, it is very difficult to get an exact number of how many people are currently climbing regularly. Rockwerx, the leading manufacturer of climbing walls in North America estimates that „approximately 5 million persons younger than 18 years of age climb in rock gyms in the United States." The number of climbing gyms in the UK have also jumped in the last 1-2 decades, with more than 350 public gyms registered in 2015 (British Mountaineering Council, n.d.). In France, there are many more rooms than this, numbering more than 2,200 (Siegel & Fryer, 2017). In Romania, compared to these numbers, the number of indoor climbing gyms is negligible. According to the summary of the Climb in Romania website, the number of climbing halls is estimated at 28-30 (Săli de escaladă în România, 2018). According to them, there are still plenty of big cities in Romania where there is no possibility of indoor climbing at all.

A 2017 survey in the UK found that 4.8 per cent of regular physical active people choose to climb and hike. This ratio does not tell us too much at first, but the study also shows that the number of climbers almost reaches the number of those who are practicing football (5.0%) (McQuaid). Also in the United States, the trend shows that more and more people are starting to engage in climbing activities year after year (Kuelthau, n.d.). Lock (2020) found that in 2018, 9.84 million people participated in climbing activities. Just to show the upward trend, in 2006 that number was 6.31 million. This represents an increase of almost 56%.

Objectives

Our primary goal is to find out how often the subjects from Romania are engaged in climbing activities and what the most popular types of climbing are. Secondly, we would like to find out where they have the opportunity to climb.

Methods

Our study follows a cross-sectional descriptive study design. The measurement was performed by a self-constructed questionnaire which contained 19 questions. The items of the questionnaire were grouped around four limited subjects, which are the following: A) knowledge about climbing; B) the frequency of climbing in the last year C) places for climbing activity and D) the importance of physical activities.

Throughout the school period of March 4, 2019 to March 11, 2019, 83 (46 boys with a mean age of 12.84±1.24, and 37 girls with a mean age of 12.83±1. 23) children were examined. 68.7% of the children were urban residents and 31.3% were rural residents.

Statistical analysis and data processing

In our research, we used descriptive statistical analyzes (frequency and mean calculation), and the chi-square test for independence was used to discover if there is a relationship between categorical variables. We used the SPSS v.20 software to analyze the data.

Results

We placed a list of 14 types of climbing in front of the children (including: tree, rock, rope, indoor, outdoor, obstacle climbing, etc.) and asked them to indicate what types of climbing have they practiced in the past year. Most climbed trees (86.7%), more than half of the respondents (60.2%) climbed ropes, almost a quarter tried indoor climbing (20.5%), and almost a tenth (9.8%) tried rock climbing, and bouldering, which was included in the Olympic Games 2020, is just showing up (2.4%).

Figure 1 shows how often respondents did climbing activities in the past year. On a weekly basis, 14.5% of respondents experience some form of climbing. Another interesting result is that approx. one in ten children has never climbed (not even a tree) in the past one year.

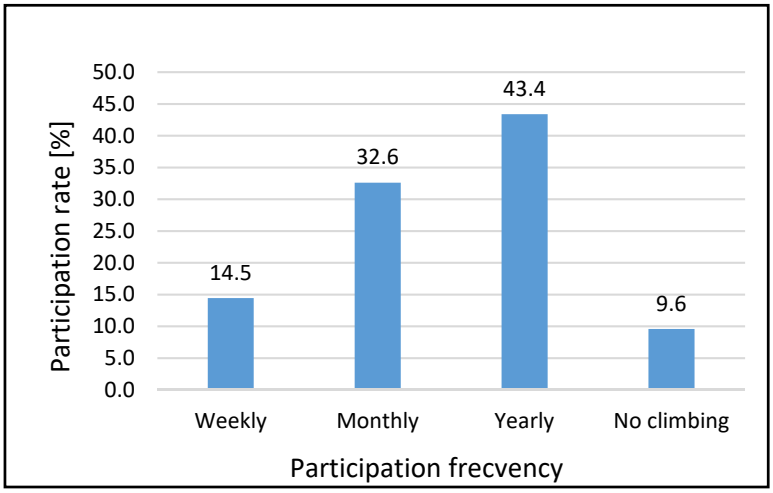

Fig. 1. The participation rate and frequency in climbing activities

The 64% of respondents say that their school gym has equipment (rope, rod, ribbed wall) that is suitable for practicing climbing. However, we consider that all schools should be equipped properly to offer the possibility of climbing. Although climbing is possible in 2/3 of the gyms, we found that only 13.3% of the respondents practice it frequently and 25.2% rarely. See Figure 2.

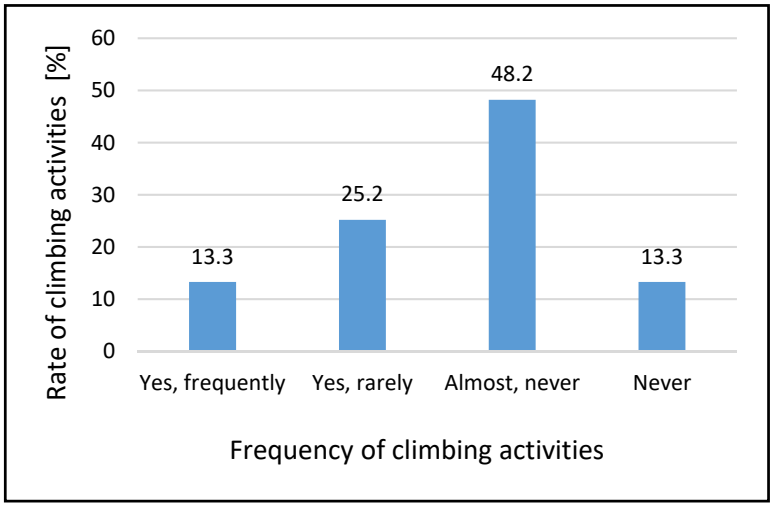

Fig. 2. Frequency of climbing activities in physical education classes

89.2% of respondents have been climbing a forest adventure park at least once. However, 30% of these have been at least 5 times and another 35% 3-4 times in an adventure park.

83% of children are aware of the importance of regular physical activities, because they think that exercises are very important for maintaining good health and another 13% consider it important. The 40% of respondents think they do enough exercise and another 38% think they do roughly enough exercise to maintain good health.

Children do not consider climbing to be a particularly safe activity, as

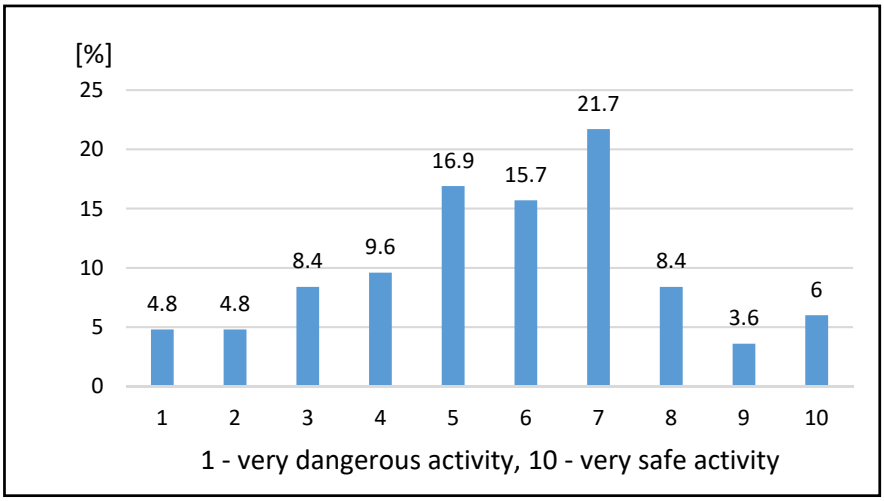

Fig. 3. Children's opinion about the dangers of climbing

Figure 3 shows. If we calculate the average from the frequency of the responses, we get a value of 5.68 for climbing safety. Only 17 percent suffered a notable injury while climbing. The result of the Pearson Chi-Square test tells us that there is no statistically significant association between injuries sustained during climbing and the opinion about the dangers of climbing $\chi(9) = 10.910$, $p = .282$. Interpreting the result of the test, we can claim that those children who have suffered injuries during climbing do not necessarily consider that climbing is a very dangerous activity, unlike their non-injured peers. Statistical analysis also shows that those who find climbing useful for maintaining health perceive climbing as being safer than their peers consider it : $\chi(81) = 105.675$, $p = 0.034$. Kids who have been in a forest adventure park several times find it safer to climb obstacles than their peers who have not been or have only been 1-2 times $\chi(27) = 39.025$, $p = .043$. Children who consider climbing safer would also prefer to climb in school physical education $\chi(81) = 115.354$, $p = .007$.

Figure 4 shows how much children are hindered by fear of height. The proportion of those who are not afraid of heights in climbing is relatively high. Calculating an average based on the frequency of the responses, a value of 6.39 is obtained.

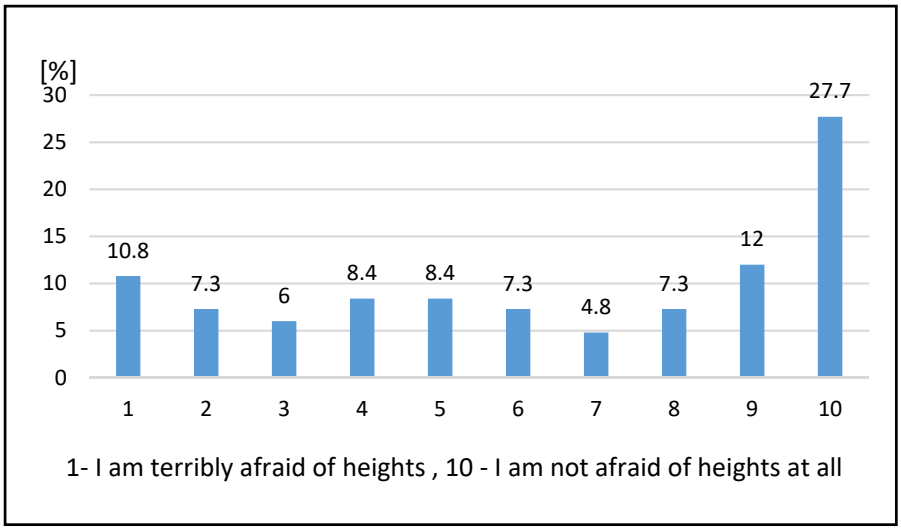

Fig.4. Children's fear of heights

We investigated whether there is a relationship between fear of heights and injuries of climbing which two, according to the Pearson Chi-Square test, have no significant correlation $\chi(9) = 4.200$, $p = .898$.

Discussion

There are far fewer places for indoor climbing in Romania than in any of the more developed countries of the European Union, but due to our natural endowments there are plenty of rock walls for climbing (more than 4550 tracks) (Climb in Romania, n.d.). In the last two decades, via-ferratas have also started to appear in our country, the number of them is slowly reaching twenty (Jbanca, 2018). Although we did not make a comparison of what other sports children practice and with what regularity, we consider that climbing is not a common one. This is suggested by the low number of climbing exercises in physical education classes.

There may even be a misconception in many people that climbing (any type of climbing) is a particularly dangerous physical activity. This is also shown by

the children's response. In reality, climbing is no more dangerous than many other sports, and looking at the number of injuries can be considered even safer. The studies are mainly based on rock, indoor and bouldering climbing when conducting research, but even so we get really low injury rates. We think that more people are injured while climbing a tree than in other types of climbing where safety equipment is used. Humphries (1993) reports 0.9 injuries in beginner, advanced and expert rock climbers after 1000 h of climbing. Backe, Ericson, Janson, & Timpka in a 2009 study mention a higher rate of injuries (4.2 injuries/1000h), but they note that 93% of these were caused by overuse. Overweight and practicing bouldering were found to be significant risk factors. Another study analyzed data collected from more than 515,000 indoor climbers, but only 0.02 injuries occurred in 1000h of climbing activities (Schöffl, Hoffmann, & Küpper, 2013).

Climbing is a movement skill that needs to be taught. Its teaching is prescribed in current and older Romanian school curricula. The teaching of its simpler forms in almost every school could be possible by a physical educator or teacher. It would be important to teach and practice as it has many benefits for children, as studies have shown (Siegel & Fryer, 2017).

With the spread of forest adventure parks (Balla & Boros-Balint, 2019), new opportunities for practicing climbing have opened up. The children's responses also revealed that many of them climbed for several times in adventure parks.

Conclusion

The interviewed children have already tried several types of climbing, among which tree climbing dominates. Of the climbs which use safety equipment, indoor and obstacle course climbs are more common.

Indoor climbing is possible in larger cities, but there are still relatively few indoor climbing gyms at national level. Adventure parks provide a new opportunity for children to practice climbing.

Even though climbing should be taught in school physical education, it does not seem to be spent much time on this. Kids would love to practice climbing in physical education class.

Limits of the study

Due to the small sample size, we did not engage in more serious statistical analyzes. We consider that data gained from a representative sample may even deviate significantly from the results obtained in this pilot study.

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