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DEVELOPMENT OF MODERN MARATHONS AND DISTANCE RUNNING

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SUMMARY

This work attempts to present the birth, development, and diffusion of modern marathon and distance running. Ancient stories and initial beginnings are fairly mentioned, but without any attempt to analyze in details the early forms of running. Instead, a more accurate study starts with the last decades of the 19th century which are being considered as crucial period for what will later become a new phenomenon of today's modern society.

The research approach relies on qualitative analysis and it's characterized, besides existing literature, with personal interviews with key figures from the area of interest. It further contains short case studies that help to understand different aspects that contributed to the expansion and improvement of the industry of marathon and running in general. Part of the analysis will be also focused on the Czech Republic, so that this work gains larger local relevance and applications.

Modern marathon and distance running is experiencing rapid growth and gains larger importance among various stakeholders. It can be said that the knowledge about its recent development is not very extensive, even among people that practice it or are directly and indirectly involved. The aim of this work, thus, is to offer selected highlights of its modern beginnings which should serve not just enthusiastic runners and organizers of marathon and long distance running events, but also historians, students, and academics as source of useful information and base for further academic works.

Keywords: sport, marathon, distance running, IAAF, AIMS, PIM

INTRODUCTION

This work deals with studying the development of modern marathon and distance running as an industry in sport that recently enjoys increasing global popularity and success. The idea is to present its modern beginnings, which means that we will mainly observe the period between the end of 19th and beginning of 20th century up until today. However, it is important to briefly explain few circumstances from the ancient world, which will offer us smoother transition in describing newer marathon history.

We can claim that it all started with Pheidippides, an Athenian 'day runner' by profession, whose job was to run all day delivering messages. He also appears by the name of Philippides, if we prefer some of Herodotus' and Plutarch's manuscripts (Marathon 490 BC, 2002). This courier was the one that, supposedly, shouted out "Be happy! We have won!" and then collapsed and died, after running around 40 km from the city of Marathon to Athens, bringing the news of victory of Athens over the Persians in 490 BC (Miller, 2004). Well, Pheidippides' name also appears in connection to rather different story. It was more likely that he ran from Athens to Sparta before the battle of Marathon asking Spartans for help, whereas his run to Athens to proclaim victory actually never occurred (Miller, 2004). In any case, we will not investigate what really happened. It is important that the myth has been created and, obviously, it was strong and beautiful enough to inspire and start the modern marathon running tradition.

After hibernating for many centuries, the myth of Pheidippides has been revived in coincidence with the birth of the modern Olympic Games in 1896 initiated by Baron Pierre de Coubertin. It was certain Michel Bréal, a friend and advisor of Coubertin, who, fascinated by the story of Pheidippides, encouraged the idea of adding a running event to the inaugural Olympic Games in Athens. As a result, the official program of the games from 1895 included a "Running event called 'Marathon' over a distance of 48 km from Marathon to Athens for a trophy, sponsored by Mr. M. Bréal, member of the Institut de France" (AIMS, 2012). Until the start of the games, the official program was few times revised, by which the distance to be run was modified, first to 42 km, and finally to 40 km. As we will see later on, the question of the official marathon distance has developed a quite interesting history on its own. Curious enough though, the Olympic race was not the first one. "A month before the Olympic race a Greek Championship event was held, in which 11 competitors ran from Marathon to Athens. This was the first ever Marathon race" (Jones, 2003). In any case, what is important is that marathon was now established and epitomized not just as a place in ancient and modern Greece, but also as a modern running event.

The next marathon happened only two months after the first games, from Paris to the town of Conflans (AIMS, 2012). This event only anticipated the development of the marathon race as a running event independent from the Olympic Games. What we will be examining in the following pages is this marathon evolution on its own, from 1896 up until present day.

METHODOLOGY

The development of modern marathon running is a process which, as nearly any other, is characterized with ongoing improvements even on a daily basis. Obviously, it is impossible to trace all the concrete occurrences that added to the growth of the marathon industry. Therefore, the methodological approach of this credit work aims to present and describe selected facts and events that significantly influenced the marathon industry and contributed to its growth. The methodological goal is to answer the following questions:

– Which historical moments were the most important ones in shaping the future of the modern marathon and distance running?

– How and why these events contributed to the growth and development of the marathon running industry?

Given the fact that the above questions can be best answered by scrutinized study of literature and direct communication with relevant experts, the applied methodological approach will be 'qualitative research method' as per the methodological indications from authors such as Hendl (Hendl, 1999). This process will include:

Subject of the research – as mentioned previously, the focus of the research will be the development of modern marathon and distance running, stretching from the end of the 19th century up until today. In addition, this work will include events that are relevant and applicable for the Czech Republic.

Qualitative approach – several concrete moments and events will be selected and explained in separate chapters, whereas the chapters will have a form of either summarized findings or short case studies.

Data collection – all inputs necessary to describe the given occasions will be collected mainly from existing literature and interviews (formal or informal) with acknowledged personalities and experts from the industry.

Research conclusion – as mentioned above, some of the results will be narrated directly in the given chapters, while others will be translated into case studies. In addition, short conclusion will follow which will close this work.

Research style – the author's style is narrative writing, avoiding graphs, tables, or statistics.

ANALYSIS

At the beginning, it is important to mention and it can be argued that the expression 'marathon' became kind of a 'brand' and, as such, sometimes is being wrongly used by the general public as a synonym for different long distance road races. The distances that are officially categorized, and their world records recognized by IAAF, are marathons (42.195 km), half marathons (21.097 km), 100 km, 30 km, 25 km, 20 km, 15 km, and 10 km races (IAAF, 2012). These race distances, in various forms, usually represent the product portfolio of marathon and distance race organizers, together with other categories such as 5 km race or relays.

In the following chapters, we will take a look at few selected milestones that shaped and set the directions for growth of this new industry and its emerging importance. Namely, it will be written about setting the marathon distance, the oldest marathon organizer in the world, the forming of AIMS and IAAF, or the running in the Czech Republic and the Prague International Marathon.

Defining the official marathon distance

As previously mentioned in the introduction of the credit work, the initial officially recognized marathon distance at the first Olympic Games in 1896 was set to 40 km (25 miles). This distance was generally used at, more or less, all other marathon events in the following years, including the Paris and St Louis Olympic races – although the St Louis race,

exceptionally, turned out to be over distance (AIMS, 2012). The major change, which proved to be essential for what we witness today, happened in 1908 during the Olympic Games in London. "The Franco-British Exhibition was being held at the new White City Stadium in West London, where the Olympic Marathon was to finish in front of the royal box from which Queen Alexandra would watch. Preserving the royal theme, the start was to be at Windsor Castle. The length was fixed at 26 miles (41.84 km) and seems to have been measured very conscientiously. A late request from the Queen, to move the start back to the East Lawn of Windsor Castle, from where it could be seen by the royal children in their nursery, added a further 385 yards (352 m)" (AIMS, 2012). This distance was standardised at 42.195 km (26 miles 385 yards) in 1921 and it remained being used until today.

Boston Marathon – the oldest annual marathon in the world

The very first Boston Marathon was held on April 19, 1897. It was organized by the Boston Athletic Association (B.A.A.) and has been managed by the same organization until present day. The association itself has been one of the nation's oldest athletic clubs, established in 1887, with an objective to "encourage all manly sports and promote physical culture" (B.A.A., 2012). One of the association's first activities was organizing springtime athletic competition which included various disciplines, but it did not include a marathon race.

The Boston Athletic Association took its inspiration to organize a marathon event during the first modern Olympic Games in 1896. One of their members, Arthur Blake, was among the drop outs during the marathon race in Athens, but his participation alone was enough to bring back home the idea to organize something similar in Boston. As a result, the world's oldest annual marathon started its successful tradition lasting for 116 years. Whereas the inaugural race welcomed 15 competitors, the centennial edition in 1996 allowed 38,708 entrants. (B.A.A., 2012).

Over the years, the Boston Marathon grew to become recognized not only as the oldest and one of the largest, but also as one of the most prestigious marathon events in the world. In 2006 it teamed up with the marathon organizers in London, New York, Chicago, and Berlin, to form the World Marathon Majors. Consequently to its increasing influence in the society, the Boston Athletic Association's objective has changed and positioned itself as "a non-profit organization with a mission of managing athletic events and promoting a healthy lifestyle through sports, especially running" (B.A.A., 2012). The Boston Marathon today represents not just a 42 km race, but also an event accessible and relevant for half marathon, 5 km, 10 km, wheelchair, or relay runners. Let's mention here the fact that the Boston marathon was not friendly towards women runners for a long time. The event gained notoriety on this subject in 1967, when an official tried to eject a woman named Katherine Switzer from the race (she registered for the race under her initial and surname only). Even though she was not the first female runner running a marathon distance, the photos of the accident aroused large media attention and represented a certain breakthrough for women in running (Switzer, 2012).

Another step forward in shaping the development of the marathon events, which especially characterizes the World Marathon Majors, is the question of handling the registration process. Namely, Boston Marathon is one of the events that attract way more applicants than the capacity allows. As a result, each year the organizers have to manage a fair

selection among all runners willing to start the race. While each event organizer is free to choose its selection criteria (e.g. through charity organizations, first come-first served, lottery), the B.A.A. is practicing a method of qualifying times. Practically, runners are allowed to apply for a start number only if they have achieved designated times established by the organizers. These time standards correspond with applicants' age and gender and can be obtained at other 'certified' races (Morse, 2012). Nevertheless, none of the applied selection criteria proved to be ideal and perfectly fair, and thus race organizers from all over the world make continuous and ongoing efforts and try to find the most reasonable formula for satisfying the demand for entries.

Another remarkable curiosity attached to the Boston Marathon is the fact that the IAAF doesn't recognize the event's fastest time as official world record. Boston's course has a net elevation loss that exceeds the IAAF's limits, so is not considered 'legal' for record purposes (Morse, 2012). It seems that the exclusion of the race from the list of pretenders for world fastest course hasn't hurt the reputation of the marathon. Obviously, some of the fastest elites are still lured to participate in the race, regardless of their null results. This might be explained by the initiative of Guy Morse (former race director and actual senior director of external affairs), who was successful to attract world top runners by his achievement to partner with main sponsor John Hancock Financial Services and introduce lucrative bonus incentives (B.A.A., 2012).

As a matter of fact, stable sponsorship deals have proved to be crucial for mere existence and development of marathon events in general. At the same time, marathon races have become very appealing platform for corporations and their non-traditional communication of corporate and social values. At the end of the day, these collaborations and partnerships are being perceived as beneficial for both parties, and also for the running community, cities, suppliers, and many other various stakeholders. Again, the Boston Marathon is among the leaders in this area. Namely, the organizers achieved not just to keep adidas as their main sponsors for the last 20 years, but have just concluded an agreement for another ten years (B.A.A., 2012).

Boston Marathon remains one of the most influential and trend setting events in the world. Being the world's oldest annual marathon means an excellent starting point to leverage on different initiatives, but also a responsibility to dictate the tempo and shape the growth and development of the marathon and running industry.

The International Association of Athletics Federations (IAAF)

In the first decade of the 20th century athletics was already one of the main disciplines of the Olympic Games, despite the fact that the sport was lacking a governing body. In 1912, the games were held in Sweden, and shortly after their closing ceremony the IAAF was formed in Stockholm on 17 July. At that time, the abbreviation stood for 'International Amateur Athletic Federation' and remained so up until 2001 when it changed its name to 'International Association of Athletics Federations'. As the current IAAF president Lamine Diack explains, the organization recognized the need for adjustment because "Athletics underwent many changes which reflected the political and socio-economic evolution of the wider world" and due to "the growth of a professional sporting world which did not exist in 1912" (IAAF, 2012).

Besides modifying the name, the organization also changed its headquarters. After more than 30 years in Sweden and over 40 years in England, the Principality of Monaco has been the IAAF's home since 1993 (IAAF, 2012).

Changing places and modifying the name was just two of the many steps IAAF undertook in the past decades. The results of years' long process of development and growth of Athletics were captured into a centenary edition of the IAAF Constitution which celebrates '100 years of Athletics Excellence'.While the document has been sophisticated to meet all contemporary complexities of sport, IAAF claims that the fundamental objectives remained untouched. Namely, as Diack continues, "the IAAF was founded to fulfill the need for a world governing authority, for a competition programme, for standardised technical equipment and for a list of official World records" (IAAF Constitution, 2011). At the very beginning, these objectives were shared among 17 national associations who founded the IAAF, and by today this number increased to 212 national member federations. (IAAF, 2012).

For a long time, Athletics were strongly and mainly associated with the Olympic Games. Hence, its 'public appearance' and general interest was based only on a four years' cycle, coinciding with the games. These circumstances slowly started to change in the eighties which was the period when the IAAF began to expand and develop its own Competition Programme. It all started in 1980 when the IAAF Council announced its first World Championships which were to be held in Helsinki. Until that year, including Moscow 1980, the Olympic Games were considered as the official World Championships in Athletics and the Olympic winner was celebrated as a World Champion. In the following years, few other events were added to the programme and, as a result, the organization introduced a coordinated package of IAAF events named 'World Athletic Series'. Its first cycle included the inaugural IAAF World Marathon Cup, and later on also added the IAAF World Half Marathon Championships. Today, the IAAF Competition Programme consists of 14 pillars, among which belongs the Road Race Labels (IAAF, 2012).

As mentioned earlier, the IAAF was founded as the world governing body for Athletics and it has been primarily, and correctly, associated with track and field Athletics. However, as we witnessed in the later developments and growth of the sport, it enlarged its government and influence also towards road race competitions, and hence absorbed responsibility for fostering and promoting long distance running such as marathon events. These long distance road races attract large population and communities of amateur and leisure runners, as they give opportunity to 'normal' people to participate in professionally organized events alongside their favorite elite athletes. This is why President Diack perceives that "it is also fundamental that we fully understand that athletics is no longer just about high performance, gold medals and records, but also about 'sport for all' and about ensuring that the maximum numbers of citizens are able to participate in Athletics. This means, of course, the thriving world of road running, which is where the majority of people actually connect directly with the world of Athletics" (IAAF, 2012).

Hence, the IAAF Road Race Labels and their regulations convey the attention that the organization is giving to the development of the long distance road race events. Namely, each year IAAF is awarding leading Road Races in the world with designated labels of quality. The rules and requirements are manifold and highlight several focuses (IAAF Road Race Labels, 2012):

– Races are divided in three categories: marathons, half marathons, and other mixed gender mass participation races. Other races means other standard (5 km, 10 km, 15 km, etc.) and recognized 'classical' non-standard distance races (Paris-Versailles over 17.6 km).
– Races must have an international elite field of at least five different nationalities between men and women.

IAAF awards Gold, Silver, and Bronze Labels which are granted for one year depending on the fulfilled criteria as per below.

Technical requirements such as:

– Organization (health and safety or participants and officials, race referees, refreshment points)
– Measurement (officially measured course by IAAF/AIMS measurer, intermediate timing points)
– Road closures (traffic free course, police and other traffic controllers)
– Timing (full electronic timers, time splits, available to media, clock car)
– Video screen (giant screen, TV monitors)
– Data processing and results (full data processing service, online availability, immediate submission)
– Athletes (international elite field, performance, reimbursement of expenses, prize money, bonuses)
– Health and safety (medical and doping requirements, refreshment stations, doping controls, safety and security to participants and minimum disruption of local residents)
– Media and promotional requirements (media center, press conferences)
– Broadcast requirements (live domestic coverage, international coverage, streaming)
– Insurance (athletes, officials)
– Equality (equal prize money)

Alongside the above mentioned high level priorities of the IAAF, the organization continuously works on many other activities that foster, promote and develop the sport of Athletics and long distance races. The federation's strategic and systematic initiatives include support of foundations, education and development centers, scientific research and publications, scholarships, or technical and social activities (IAAF, 2012). Furthermore, it teams up with other subjects and parties, with whom it agrees on various memorandums of understanding for mutual promotion and support. Such an initiative is ongoing with the Association of International Marathons and Distance Races (AIMS), about whom it will be written more in the next chapter.

Association of International Marathons and Distance Races (AIMS)

As mentioned above, marathons and other long distance road races were for a long time on the margins of interest for the IAAF who was predominantly occupied with track and field events. Nevertheless, the expansion of marathon events was growing its own way and the number of race organizers was adding continuously. "… it seemed as if every city in the world suddenly wanted a marathon, and many organisers responded to the demand," says Hugh Jones, Secretary of AIMS (Jones, 2012). Back in the eighties, some of the most agile race organizers started to meet and discuss ideas for cooperating with each other. One of

those ideas was organizing a 'World Circuit' of Marathons, which eventually faded out. However, race organizers recognized the potential of staying close and continued to meet informally, now with a vision to establish an association. It was soon after, in a formal meeting in London on 6th of May 1982, when the 'Association of International Marathons' (AIMS) was established by 28 founding member race organizers. One of the most acute challenges troubling race organizers was the need to set up strict measurement criteria that would ensure and prove that the marathon distance was indeed of a correct length. As these kinds of topics were numerous, the organization soon realized the need to provide more structured and strategic guidelines of the association. As a result, three general objectives were embodied in AIMS statutes, and they remain valid until present day (AIMS, 2012).

– To foster and promote distance running throughout the world.
– To work with the International Association of Athletic Federations (IAAF) on all matters relating to international distance races.
– To exchange information, knowledge and expertise among members of the association.

These objectives, translated into concrete actions over the years, have brought obvious results and success. One indicator that shows AIMS's growth and influence is the number of its members which increased to more than 320 races, reaching even territories such as the Arctic or Antarctica. Another pointer showing its impact on the running world is the fact that, similarly to IAAF, it undertook a change of its name to the 'Association of International Marathons and Distance Races'. Even though the abbreviation AIMS remained unchanged, the new name clearly indicates AIMS' resolution to foster and promote all kinds of long distance running (AIMS, 2012). It was at the 4th World Congress of AIMS in Manila, where the Berlin 25 km and the Gothenburg Half Marathon were two of the first non-Marathon events to join the association (25 years, 2007).

AIMS' strong intention to work closely with the IAAF on all matters relating to international distance races has been expressed through many realized and ongoing incentives.

One very important partnership lies on the recognition of the calibrated bicycle method as the only approved method for measuring road races. "The system of measurement developed by AIMS was officially adopted by IAAF in 1988, and enshrined in their rule book" (25 years, 2007). This joint work of the two organizations soon after resulted in recognition of world road records as of 2004 due to having the acceptable criteria for their accreditation.

Furthermore, the two teamed up in publishing the 'Distance Running' magazine which serves as a platform for promotion of races, offering calendar of all events, and finding other useful information for race organizers and runners. The magazine represents an improved and more sophisticated continuation of the earlier AIMS Yearbook which was one of the main tools for self-promotion of the races since 1985 (AIMS, 2012).

Last but not least, a cooperative effort of AIMS, IAAF, the Athens Classic Marathon, the Greek Athletic Federation SEGAS, and the town of Marathon gave birth to an annual Marathon symposium held in Greece. Its first edition took place in 2007 and every year has a goal to "encourage close co-operation and exchange of views on issues of mutual interest which will assist organisers in their constant efforts to improve their races". In addition, the Symposium "also raises significant symbolism related to World Peace, Olympic Ideals, and Fair Play" (IAAF, 2012).

AIMS objective to foster and promote distance running in the world has been as well implemented through several ongoing initiatives.

Since its first year of existence, AIMS has been publishing a monthly newsletter to keep up to date with AIMS business and record the results of member races. The newsletter today enjoys its modern electronic version, reaching a database of more than 450 contacts of race organizers, sponsors, journalists, and other stakeholders (Borao, 2012).

Furthermore, in 2006 the organization launched the AIMS Children's Series with the main goal to promote running among children especially in regions and to organizers that need assistance, such as in Sahara, Nepal, or Ethiopia. "Many great athletes have often emerged against great adversity" announced former AIMS President Hiroaki Chosa, and continued "We are seeking to encourage more young children to follow their dreams and to aim for a healthy life" (AIMS, 2012).

The organization further introduced and fosters the AIMS Awards, an initiative comprised of several categories and areas of interest. Together with its sponsor Asics, it introduced the AIMS/ASICS Athlete of the Year Award, which acknowledges outstanding male and female runners' athletic achievements and their 'ambassador' roles in promoting their sport and country. It also established the AIMS World Fastest Time Award which is being given to any runner who breaks the world record in the marathon or half marathon. Lastly, it brought up the AIMS/MYLAPS Innovation Award, which encourages innovations from the area of organization (logistics, course, marketing, volunteers, etc.), sport itself (participation, image, and fair play), runners (elite, amateurs, and safety), the environment and community, or media. The criteria for innovative quality relate to the uniqueness of the nominated innovation, its long-term effect, and its positive effects (fun, involvement, and image). Mylaps (formerly ChampionChip) itself was one of the catalysts in innovations in running. Their revolutionary new technology to time races by a transponder worn on the foot that records time as it passed through a magnetic field generated at a timing point undoubtedly changed the course of development of the marathon industry forever (AIMS, 2012).

In addition, the organization created an AIMS Marathon Museum of Running, initiated by Horst Milde – race director of the Berlin Marathon, and incorporated into the Berlin Sport Museum since 1994. Through the collection and exhibition of over 100,000 artifacts, the museum documents the development of marathon and running in general. Among some of the most valuable collections are, for example, an olive crown presented by the mayor of the town of Marathon, or the running kit worn by Haile Gebrselassie when he set the World record in Berlin (AIMS, 2012).

When it comes to fulfillment of the objective to exchange information and knowledge expertise, besides the already mentioned symposium, AIMS' main platform offered to race organizers is the biannual World Congress of AIMS. Introduced in coincidence with the foundation of AIMS in 1982, it grew to become the world's largest gathering of race organizers. Its 19th edition held in Prague in 2012 welcomed more than 240 delegates representing 122 race organizers from 55 countries (PIM, 2012). "The congress gives opportunity to race organizers to meet, share experiences, and learn from each other," says Paco Borao, president of AIMS (Borao, 2012). "It is important that the world of marathon running meets on regular basis and exchange ideas," continues David Bedford, the IAAF Road Running Commission Chairman (Bedford, 2012). Similar opinion shares

Sean Wallace-Jones, IAAF Road Running Senior Manager who is "extremely pleased to see such a great participation, lot of interaction among participants, and excellent standard of the organization" (Wallace-Jones, 2012).

The 'Association of International Marathons and Distance Races' celebrates in 2012 its 30th year of existence. Its latest developments and initiatives include moving its headquarters to Greece – the birthplace of the marathon, and preparing for the 20th World Congress of AIMS which will be held in Durban, South Africa (Borao, 2012).

Long Distance Running in the Czech Republic and the case of the Prague International Marathon (PIM)

The Czech Republic has long tradition of nurturing marathon and long distance runners as well as organizing running events. Just mentioning the name of Emil Zátopek says enough about the recognition and important position this country holds in the world of Athletics (Ejnés et al.). If we go even before Zátopek's time, we will find other running champions and interesting stories about the running culture in the Czech Republic. For example, the golden book of Athletics (*Zlatá kniha Atletiky*) tells us the story of Arnošt Nejedlý, who in 1906, travelled to Greece to run the already appealing 'original' marathon race. "At the beginning period of our Athletics, long distance running was among the most popular competitions, and so the winners of those races were publicly well known and famous people. One of them was Arnošt Nejedlý" (Janecky et al., 1978). It is certainly worth mentioning the name of Jakub Wolf, a three time winner of the first three editions of the Běchovice race. "27th of May 1897 became for us a historic date. At that time, we hadn't clue that we were setting the base stone of the most popular running event of our Athletics," says Wolf (Janecky et al., 1978). Indeed, the race has been hosted each year without a break – at 116 years it is the oldest road race on the continent (Bednář, 2011).

Another running event that fosters its tradition as the oldest marathon race in the Czech Republic (together with a marathon in the city of Ostrava) is the Prague Marathon held in the Stromovka park. This event in 2012 celebrated its 50th anniversary and only adds and contributes to the development and growth of the running culture in the country (Pražský marathon, 2013).

Coming back to Zátopek, it is important to acknowledge his contribution to running in the Czech Republic also after his active running days. Namely, he was the honorary founder of the Prague International Marathon (PIM) back in 1994, participating in the organization until his last days. Since then, PIM managed to achieve emerging local significance and appliance, but also big international success and acknowledged position in the marathon and distance running industry. Today, PIM organizes the largest marathon and half marathon races in Prague and whole country in regards to participation of runners. Moreover it organizes other five major running events in Prague and other four regions in the Czech Republic.

It all started in 1994, when Carlo Capalbo, the founder of PIM and his close friend, the Olympic medalist Gelindo Bordin, were talking about the idea of organizing a marathon event in Prague, with a goal to achieve appeal similarly like it was already the case in London or New York. One year later, in 1995, the first marathon event organized by the Prague International Marathon saw the light of day. Emil Zatopek was the one who ceremonially

fired the starting pistol and 958 runners rushed through the city. The organization started with one annual marathon event in Prague in 1995, and added many more in the following years, such as half marathons, Grand Prix of 10 km and 5 km race, Junior Marathon, Corporate races, Minimarathon, Family Runs, Eco Walk, and Walk with Dogs. The final outcome in 2012 is a portfolio of 48 events in 14 cities in every region of the Czech Republic (PIM in numbers, 2012).

Throughout the course of its 18 years old history, the organization has gradually evolved and has accumulated several milestones, which reflects the increasing popularity or running in general in the Czech Republic. Few highlights are presented below (PIM report, 2011).

In 1999, IAAF called the Prague Marathon 'the most international marathon in the world'; not to a big surprise, knowing that the last edition hosted runners from 106 nationalities from all over the world. In 2004, the T.O.U.R.S. association had chosen Prague Marathon as "the most favorite European marathon destination". In 2005, the book "The Biggest Marathons in the World and their History" placed the Prague Marathon among the Top 10 marathons in the world. The same year PIM received "Sponsor of the Year" award for its contribution to Czech sport. In 2007, PIM becomes one of the top 5 recognized sport brands in the Czech Republic. In 2008, IAAF awarded the Prague Marathon and Half Marathon with an "IAAF Road Race Silver Label", placing Prague among just a few cities in the world with this prestigious award. The award was confirmed and progressed to the highest Gold Label in 2010, which PIM continuously regains until today. Moreover, by 2012, PIM became one of the only two organizations in the world owning five IAAF labels in total (two Gold and three Silver). In 2012, PIM hosted the 19th World Congress of AIMS, which proved to be the biggest gathering of running in the history.

CONCLUSION

The marathon mania of today was born in line with the birth of the first modern Olympic Games back in 1896. The first decades afterwards were characterized with their close co-functioning and, it seems, it could have easily happened that running would be destined with a four years' peak cycle. Instead, the development and growth of marathon and long distance running took its own directions.

The sport was first embraced under the umbrella of IAAF, however yet in the shadow of track and field Athletics. Nevertheless, in parallel to events accustomed to professionals and elite athletes, 'private' race organizers were offering road race marathons and long distance events open to amateurs and leisure runners. One of the first of this kind, and today's world oldest annual marathon event, is the Boston Marathon. Once the sport gained larger attention, interest, and recognition, the Boston Marathon became symbol of tradition, prestige, and innovation.

As road race long distance events emerged and continuously grew in importance, several leading race organizers recognized the need to get together and work closely on matters that challenged the progress of the sport. As a result, another association was formed (AIMS) whose main objective, this time, was to foster and promote principally distance running, to exchange knowledge and expertise, but also to work closely with the

IAAF on all matter relating to international distance races. Since then, meaning the early eighties, the road race long distance running experienced some large shifts. Race organizers adopted the IAAF/AIMS unified method of measuring the distances, which, among else, prepared conditions for tracking, recognizing, and celebrating world records. While the public awareness is, even today, mainly focused on the marathon 'brand' of 42 km race, long distance races are extended to half marathons, 100 km, 30 km, 25 km, 20 km, 15 km, and 10 km races. These distances are as well among the ones with recognized records, and there still exist other 'less traditional' runs.

The development continued and few other improvements followed, which set the grounds for another milestone of the sport. Namely, the IAAF established rules and criteria that will evaluate the quality of long distance road race events, and consequently it will recognize the organizers with appropriate awards. The awards are translated into Gold, Silver, or Bronze IAAF Road Race Labels, according to fulfillment of conditions such as organization, elite field, security, media, timing, measurement, and others.

The United States of America and Western Europe were the catalysts of growth and dispersion of marathon and long distance events during the eighties and the nineties. However, the marathon boom expanded geographically and other regions soon paced up, both in quality and quantity. One example that shows this diffusion is the success story of the Prague International Marathon (PIM), an organization that only continued the long lasting tradition of the Czech Republic as a country that fosters running champions and traditionally organizes running events of world-wide importance and recognition. The case of the Běchovice race, the oldest race in the world, together with Boston marathon, is just one of the highlights.

All these various initiatives set the tempo and directions for continuous growth and development of marathon and long distance running, but also shape and promote positive social values.

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VÝVOJ MODERNÍCH MARATONŮ A DISTANČNÍHO BĚHU

SASHO BELOVSKI

SOUHRN

Tato práce si dává za cíl prezentovat vznik, vývoj a šíření moderního maratonu a distančního běhu. Práce se rovněž okrajově dotýká prvních historických pramenů v oblasti běhu, avšak podrobná analýza jeho raných forem není jejím účelem. Detailnější studie je naopak věnována období počínajícímu posledními dekádami 19. století, které zásadním způsobem předznamenaly vývoj směřující ke vzniku nového fenoménu dnešní moderní společnosti.
Způsob výzkumu je založen na kvalitativní analýze a kromě využití existující odborné literatury je charakteristický především osobními rozhovory s klíčovými osobnostmi z oblasti distančního běhu. Práce dále obsahuje krátké případové studie umožňující lepší pochopení jednotlivých aspektů, které přispěly k expanzi a pokroku v oblasti maratonu a běhu obecně. Část analýzy se zaměřuje konkrétně na Českou republiku, aby tak mohla mít co nejširší lokální význam a využitelnost.
Moderní marathon a distanční běh zažívají výrazný rozmach a přitahují stále větší zájem všech zainteresovaných osob – stakeholderů běžeckého sportu. Můžeme však konstatovat, že mezi aktivními běžci jakož i mezi dalšími lidmi, kteří jsou přímo či nepřímo s distančním během spojeni, nejsou vědomosti o jeho současném rozvoji příliš hluboké. Tato práce chce nabídnout vybrané, zásadní události moderní historie distančního běhu, a sloužit tak nejen zaníceným aktivním běžcům a organizátorům běžeckých závodů, ale též historikům, studentům a akademikům jako zdroj užitečných informací a základ pro budoucí vědeckou činnost.

Klíčová slova: sport, maraton, distanční běh, IAAF, AIMS, PIM

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TIME AND CORPOREALITY

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SUMMARY

The text emphasizes the difference between Aristotelian and Heideggerian concepts of time in relation to the issue of corporeality and sport.

Keywords: Aristotelian time, successivity, Heideggerian temporality, adoration of performance, body, corporeality

If we define all of the observable parts of a flower, i.e. its roots, stems, leaves, flowers, seeds, etc., if we strictly scientifically describe all of its cells, their chemical composition, then this is not sufficient for us to understand it as a whole. Even a more accurate description will always be superficial, even though the describer often will not admit this – he is not aware of it. If we put the broken parts of a violin together exactly as they were, it will still never play the same way. Aristotle's letters "b" and "a" are always something other than their composition in the form of a syllable. A syllable is not found in a letter, it is created only by combining them together in a particular way. This is not a coincidence. What we cannot at this moment understand constitutes the whole of the syllable – without this "invisible and incomprehensible", a syllable would not be a syllable. A flower is not the sum of observable predicates which are measured and measured and the measurement can never be finished, because this knowledge has *regressus ad infinitum* within in. Why?

The answer is simple, as in all cases where it is about something essential. Counting is only possible in a series which does not have an end. So it is with the human body. We can describe it for an infinitely long period of time, but the whole will be one big unknown. Lenin is simply wrong in his Materialism and Empiriocriticism, where he claims the opposite, i.e. that knowledge through human empirical practice is completely exhaustible. It is not. The body is not just the sum of the parts; it is not addition, not a patchwork. Such a view is Cartesian. This approach breaks everything down, it is called scientific analysis, and then scientific methods are used to put everything back together again. This process often leads to misunderstandings, which are deferred as something that does not

have its proper time. The description is always flat and superficial. Understanding and comprehension are something completely different. Unconcealedness must be torn from concealedness. The problem is the answer, to which we have to discover the question.

Time is "more" than we think. It is not just the number of movement, as Aristotle taught us. This definition of time has caused us to break everything down into parts and then glue it all back together again. This is what we call science. Analysis, scientific analysis is the basis of thinking. Therefore, society is analyzed in parts and each part is described by a specialist, i.e. an expert who knows nothing other than his subject, because he must be so very knowledgeable in his specialty. For example, we have experts on bullying in schools, who in addition to bullying described in a Cartesian way, know nothing else. Such an expert knows exactly how many students are bullied in Czech schools, he can show us similar figures from abroad and give us the impression of an expert. However, the expert never made the phenomenon of bullying the subject of his innate questioning because he never thought about anything like that. He describes processes which are describable i.e. he measures them, and will measure then for the rest of his life and pass his results on to other scientists. This is also his approach to the body and its manifestations, which we call corporeality. Doctors only calculate, they know statistics, and then they treat. What about the body?

The concept of time holds the key to understanding in itself. If time is a number of movement, as it is absolutely everywhere these days, then the body will only be the subject of description in a scientific manner. Even qualitative research cannot escape this claim. Temporality is Heideggerian time. Here time is not just for describing phases in a line, from which arises a number (arithmos). Time is something that conjugates, that reveals, that phenomenalizes. Time is something that allows things to change into different shapes, thus making a thing as thing; it is show in its form, in its outline, in the certainty that belongs only to it. How do we recognize man? Only when he reveals his true nature through his actions, because actions have solid contours, they have a precision that cannot be denied. Everything that emerges from concealedness resembles a thing that is revealed in the daylight while at night it is hidden. For a person to emerge from concealedness he must perform an action. Only through their actions can we know them, we can recall the well-known proverb "by their fruits ye shall know them". Man can hide, but his actions will always reveal him, it is not possible to hide completely. Only a fool thinks he can. Even the human body is shown in its actions, one of which is sport, competition, physical exercise. The ultimate truth about oneself is revealed in the Olympic Games, and that is why the flame is a symbol of the Olympic Games. Fire is the purest element we find on Earth. It cleanses everything, and even contemporary doctors know this, they disinfect everything with fire.

The body is embodied temporally, not in an Aristotelian way, i.e. successively. Science describes succession, successivity; however, it overlooks the processes that occur concurrently, co-existentially, simultaneously. Man thinks about a specific problem and yet he still goes on, he avoids people walking towards him, he follows the path to his objective, he takes a deep breath, he moves his arms and legs, he stands upright, he talks with others when they ask him to, he carries his bags, he crosses the street when the green man flashes. In every moment of our body the centers of many activities are separable from each other, each requires its own focus and self control, and yet such a person is simplicity itself, he knows nothing of the sum, addition, analysis and subsequent synthesis. How is it possible

that we cannot see or understand this miracle of simultaneity? Why is this so? Because we work on Aristotelian time which is difficult to escape from and understand differently. Scientific description of the human body in sport is also only made in Aristotelian time, which we can all realize if we let the question emerge from the concealedness we call obviousness.

Temporality is not a successive, sequential and gradual course of time. Not only does the present carry within itself the substantial past (die Gewesenheit) but also the expected future. The body is a "conserve" of time. We know from experience that the body "remembers" better than our minds. Poor exercise habits are difficult to eliminate – gymnasts, skiers and others know this all too well. Man never "works" as a causal machine, but science describes man as such. We try to find the cause, and if we do then the explanation is complete. We know about retention (memory) and protention (perception of the next moment). We know about the corporeal scheme which forms the background for what we perceive in the present. This leads us to the fact that we cannot describe the body as an area in space but as a temporal entity, which we currently do not do, which is not formulated into questions. We believe that this omission of the temporal body is very significant and that in this context many ways of curing diseases that are currently treated chemically and physically are currently hidden. Heidegger calls the plan of the future, Dasein (existence) and realizes that Daseinsanalysis is the key to temporality which represents a non-Aristotelian concept of time. It should be noted that all causality, a subject-object figure of thinking in virtually all Cartesianism, consists in an Aristotelian determination of time as a number of movement. Here lies the core of the prevalence of the future above the present and the past. Here lies an explanation of why people today only want what is "in" what is modern, what is not "worn". Here also lies an explanation for the defaming of the elderly; we see the signs of this almost everywhere. Young people only want what is modern, but of course something that is modern immediately becomes old and obsolete. This is connected to the unspoken belief that everything old is outdated and hinders progress.

This transforms history into mere information on what happened without immersion into depth or substance. And so, man is transformed into the hunter of modernity that we see everywhere, especially in science. But temporality teaches us that the origins (die Anfaenge) do not age. They will always be born for the first and last time and we always be born deeper, truer and more fundamental. When we fall in love it is always for the first and last time, it is not causal, it is just born and it is here, nothing more needs to be said about it. This should be the basis of history, not causal facts described from the standpoint of the winner, who always finds new historians to explain history from their perspective. The origins are beyond the sequence of time, they originate, they are born, in contrast to the beginning (der Beginn) which is a cause of the effect, i.e. belonging to and being created by causality. Heidegger often says: The origins are not behind us but they are ahead of us. For example a university is not a company for money makers, it is a place where there are origins, a place where the origins are born for the first and the last time, therefore it is a campus out of bounds to market policy. Hence, a university is a place where age is treated not as being worn out but rather as a space for the inauguration of origins. Where there are origins, that place is sacred. Where something is sacred, there is an understanding of life different to that which we see around us today. Where something is sacred, there is dignity and where there is dignity there is Kantian sublimity, where there is Kantian

sublimity, no one lies or steals. There is the body, and corporeality is perceived differently than a description of chemical and physical causality.

That which releases time into the present, emerges – it phenomenalizes. Time decides on the present, time is also what eats the present; just think of Cronus and how he devoured his own children.

Hence, time is so important for the essence of being. In the case of corporeality it is important to know about temporality, i.e. that our body contains within itself the potency of origins which we cannot remove, which always emerge from corporeality, always for the first and last time. To identify them, is the task of a good coach, a good teacher, a good parent. Unfortunately, children are not copies of ourselves; on the contrary, they always show to us how they are different from ourselves. In our body we find the origins and beginnings. Origins are always reborn – they originate, they are convoluted, implicated meanings. Conversely, beginnings are explicated, developed meanings, they are only a manifestation of causality, which are described by science through its proven methods, and based on which decision are made on the ontology and onticity of the problem. The body is not something to be described, such as a stone or a chemical process; it is not a research subject. The body embodies, it unfolds and brings forth the origins which are somehow already within us, we carry within ourselves the most important possibility which has control over our lives. We should not think that that we must shape our body into an image created by TV advertising. We repeat, the body is not a subject for the realization of our will, even if this will stands on proven scientific principles, of which there is "no doubt". It is essential to find a different approach to the body, not strictly objective, only then sport can return again to the sanctity to which it essentially belongs, which is shown in the Olympic Games. The highest point in our lives can only be reached through existential questioning, regardless of whether this questioning is in the form of religious ritual or through competing in the Olympic Games. The result is always the same, this conflict, this existential questioning, is the birthplace of the origins, which cannot be otherwise evoked, only through real questions.

Spirituality is not just the domain of religion; spiritual dreams show us the origins, which originate, always for the first and last time. This place, this temple, is the human body in the process we call corporeality. In this respect, the body is a miracle; it is a manifestation of the past, present and future all at once. Only in this context can we realize how an Aristotelian understanding of time is confusing and misleading. It should be noted that all scientific thinking today is an Aristotelian project, it should be clearly understood that Heidegger was not wrong when he derived human existence from time.

Aristotelian successivity leads to a prevalence of the future, which is mainly realized through liberal theories and concepts of life in human society. This leads to an adoration of power, the will to power, which means only one thing for sport: the production of technology of the highest performance – the economy of growth, which in life leads to self-destruction through constant competition as to "who will be better!".

This is not the best viewpoint. Sport becomes a mirror of society as a whole because it is based on the manifestation of power. The fight against doping is just a game between lawyers and chemists, without foundation. The body transforms into a means to deliver a performance. Corporeality is planned, controlled and managed like in a company. Doctors control the successivity of our lives; they plan and control our corporeality. Where is the space for the fundamental freedoms which even an ant has? Our corporeality has

a control over fashion. What is fashion from a philosophical point of view? It is merely the prevalence of the future above everything else. It is the domination of the successivity of Aristotelian time, nothing else. Where does the plan of our life lead to in an Aristotelian concept of time? Inevitably it leads to the adoration of modernity. This phenomenon is most important for the present. Only that which is modern can survive, it is regarded positively. But of course that which is modern becomes something old and superannuated at the time of its creation. This is how the phenomenon of "das Man" from Heideggerian philosophy works. Nobody is modern because everybody is modern. What does this lead to? Contempt of the past, contempt of all that is old and outdated. Harmonization of this kind is intrinsic in all decision-making processes that affect everything. Managers must be "in", they must have the latest computer and mobile phone. No one realize that this kills what is essential from the past, what Heidegger calls "the origins – die Anfaenge". But the origins are not behind us in the dark past, on the contrary they are reborn in each layer of history, always for the first and last time, they are the axis of our historicity. The Olympic Games must be reborn for the first and last time in every layer of history in the form of a spiritual origin, which is symbolized by fire. The flame did not become a symbol of the Olympic Games by accident.

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ČAS A TĚLESNOST

ANNA HOGENOVÁ

SOUHRN

Tento text zdůrazňuje rozdíl mezi aristotelským a heideggerovským pojmem času ve vztahu k tématu tělesnosti a sportu.

Klíčová slova: aristotelský čas, sukcesivita, heideggerovská temporalita, obdiv výkonnosti, tělo, tělesnost

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ACTIVE AND PASSIVE THERAPY OF THE UPRIGHT POSTURE AND ITS INFLUENCE ON THE HEMODYNAMICS OF THE UPPER LIMBS

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SUMMARY

Poor posture negatively influences the hemodynamics of the upper extremities. In clinical practice, this is known as Thoracic outlet syndrome. Poor posture leads to muscle imbalances which are solved with the active exercise or using the passive technique – taping. This work is an experimental pilot study dealing with the kinematics and taping of the cervical-thoracic spine and their influence on the hemodynamics of the upper extremities. Ten subjects aged 26 ± 2 years, weight 56 ± 4 kg, height 161 ± 8 cm (mean ± SD) without pathology or injury of the shoulder girdle and spine were recruited. First part of subjects (5 persons) externally rotated the arms. During this exercise the kinematic analysis was used for determining the extension of the thoracic spine. Another part of subjects (5 persons) used the taping of rhomboids and pectoralis minor muscles. The hemodynamics of the axillary artery was determined with the sonography at both groups. The taping improves the hemodynamics of the upper extremities easier than the active exercise, which should be done with the control of the physiotherapist.

Keywords: hemodynamics, upright posture, thoracic kyphosis, axillary artery, taping

INTRODUCTION

The change of lifestyle with a technological development leads to a reduction in physical activity (Morris et al., 2006). Many authors deal with poor posture in children and adults (Kratěnová et al., 2007; Šeráková, 2006). Poor posture is reflected in people with long-term forced working position (usually in sitting position). It leads to pushed-forward head position, rounded and depressed shoulders and to increasing of the thoracic kyphosis. This position places stress on the spine (Berthonnaud et al., 2011). In this passive poor posture the body saves the energy, because ligaments are more activated than muscles (Véle, 1995). Faulty posture is the source of many disorders and affects on the mental state, digestive system, breathing, hemodynamics of the upper extremity and musculoskeletal system.

Thoracic kyphosis is created during a child growth – the mobility and the shape of thoracic spine decrease. Almost 30% of children do not have optimal static settings

of spinal segments (Kolář et al., 2005). The thoracic kyphosis is dependent on physical activity – the thoracic kyphosis increases without sport activity and its mobility decreases. The function of the axial system is linked with the function of the upper limbs (Véle, 1997). In persons with hyperkyphosis both shoulders and upper thoracic spine motions become limited. The thoracic hyperkyphosis decreases muscular strength of the upper limbs and conversely (Lewit, 2003). Cheshomi et all (2011) concluded that increasing of the curvature of thoracic kyphosis causes the protraction of the scapula and endurance of posterior shoulder girdle muscles decreases. The muscles of the shoulder girdle are closely related to the muscles of the spine. DiVeta was interested in poor posture. Forward shoulders are the result of an imbalance between shortened or stronger pectoralis minor muscles and an elongated or weaker rhomboids and middle trapezius muscles (DiVeta et al., 1990). The decrease of the thoracic hyperkyphosis is described by Smíšek (Smíšek et al., 2011) whose patients are trained in retraction of the scapula, adduction and external humeral rotation.

Poor posture negatively influences the hemodynamics of the upper extremities. Thoracic outlet syndrome occurs in patients with thoracic hyperkyphosis other disorders of the cervicothoracic spine (Collins, 2003), The kyphosis rotates the scapulae anterior laterally, clavicles anteriorly, displaces the manubrium posteriorly, which increases the slope of the first ribs. This increases tension on the anterior scalene muscles and the neurovascular bundles. Thoracic outlet syndrome is caused by compression of a nervous and vascular (suclavian, axillary artery) plexuses in the area of upper thoracic aperture (Podlaha, 2007). Rehabilitation therapy usually includes correct posture, elevation of the thorax and shoulder girdle, the compensation of excessive lordosis, kyphosis and outstanding scapulae. Due to the rehabilitation, the symptoms disappeare in up to 50% of patients (Zatočil, 1997).

PURPOSE

The purpose of this pilot study is to evaluate the effect of the upright posture on improving the hemodynamics of the upper extremities. Poor posture is described as depression of the thorax, thoracic hyperkyphosis with rounded shoulders and protraction of the scapulas. This can be therapeutically solved with the active exercise or passively using the taping technique. The external rotation and adduction of the shoulder leads to the upright posture of the cervical-thoracic spine (Jelínková, 2012). Do these postural changes lead to a change of hemodynamics in the axillary artery? Is the active exercise better than the passive therapy taping for improving the hemodynamics?

METHODS

Subjects

Poor posture is reflected in people with long-term forced working position (usually in sitting position). We selected 10 subjects – 5 cyclists and 5 students without sport activity, aged 26 ± 2 years, weight 56 ± 4 kg, height 161 ± 8 cm (mean ± SD). All were without the pathology or injury of the shoulder girdle and the spine.

Kinematic analysis

The external rotation and adduction of the shoulder was used as the active exercise for the upright posture. In the case of the first group of students, the kinematic analysis (producer Qualisys, 6 cameras Opus, frequency 200 Hz) was used for determining the position of the clavicle, thorax, pelvis and the curvature of the thoracic spine. The markers were placed on the anatomical landmarks as ISB recommended (Anon, 2002; Wu et al., 2005) see Table 1. Subjects did not know the purpose of the study, they did not know the tested movement and they did not learn this movement. Subjects were instructed to perform following task: breath out, externally rotate the arms, hold the elbows at the body and hold the final position for 5 seconds. The subjects did the whole procedure only once. The curvature of the thoracic spine was given with 12 markers on the thoracic vertebrae, calculated as polynomial of the second order in the Excel. The position of the clavicle, thorax (xyphoid process) and pelvis (SIAS) was determined as the translation movement (from the initial position to the final position) in the sagittal plane.

Table 1. Placement of markers

Spine	Spinous process of cervical (C2, 4, 6, 7), thoracic (Th 1–12) and lumbar (L1, 3, 5) vertebrae
Pelvis	Spina iliaca anterior superior (SIAS), spina iliaca posterior superior (SIPS)
Thorax	Clavicle, xyphoid process

Sonography

The second group of 5 cyclists was firstly examined with the ultrasound in a rest sitting position, than the taping technique as a passive therapy of the poor posture was used. Taping was applied on the pectoral minor and rhomboids muscles for 5 hours. Then the hemodynamics of the axillary artery was determined with the ultrasound at both groups. The first group of students underwent the ultrasonography in the final position of the external humeral rotation. The second group of cyclists did the ultrasound examination in a sitting position with the taping. For the sonography the machine Logic C9 (producer GEMS, the linear probe) was used. The flow rate of the artery was determined according to the velocity and the diameter of the artery, $Q = Vm\_mean \times A$. The percentage flow rate was calculated like this equation, $dQ = (Q2 / Q1) \times 100$, where Q1 is the flow rate in the initial position and Q2 is the flow rate in the final position.

RESULTS

The tested movement leads to the extension of the thoracic spine and elevation of the thorax (see Figure 1). The condition of the upright posture is to keep the pelvis in neutral position, to avoid the anteversion of the pelvis which causes the imbalances between abdominal, pectorals and dorsal muscles. Kinematic dates of the group of students are

presented at Table 2, results of the ultrasound examination are in Table 3,4. Results of cyclists are in Table 5, 6. Taping was suitable for all cyclists. Taping can be used for improving the hemodynamics of the upper limbs. The exercise must be done under the control of the physiotherapist to do the optimal upright posture to improve the hemodynamics of the upper limbs.

Table 2. Kinematic values of the group of students

Subject	1	2	3	4	5
Curvature / poor posture	0.0036	0.0030	0.0026	0.0026	0.0024
Curvature / upright posture	0.0030	0.0028	0.0022	0.0030	0.0024
Position of pelvis	posterior 2 mm	anterior 37 mm	posterior 16 mm	anterior 9 mm	anterior 3 mm
Elevation of thorax	anterior 11 mm	anterior 2.5 mm	posterior 2.5 mm	posterior 11 mm	anterior 2 mm
Elevation of clavicula	anterior 12 mm	anterior 2 mm	posterior 2.5 mm	posterior 5 mm	anterior 2 mm

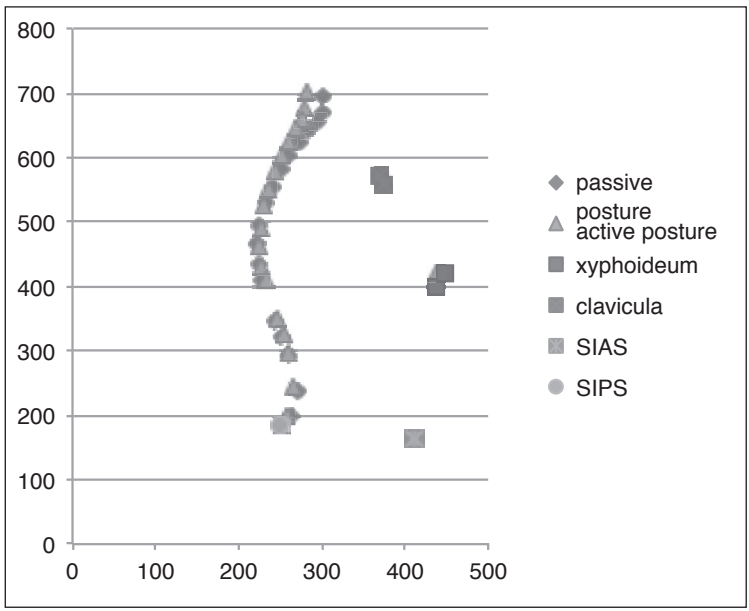

Figure 1. Graph of kinematic values, subject – student 1

Table 3. Measurements of ultrasound, group of students (Vm_mean 1, Vm_mean 2 – mean of velocity, Q1, Q2 – flow rate of artery, A1, A2 – diameter of artery, dQ [%] – percentage flow rate, Q = Vm_mean × A, dQ = (Q2 / Q1) × 100)

Rest position Subject	**A1 [cm^2]**	**Vm_mean1 [cm/s]**	**Q1 [cm^3/s]**
1	0.27	10.80	2.92
2	0.29	13.50	3.92
3	0.22	9.60	2.11
4	0.28	10.20	2.86
5	0.14	10.70	1.50
Final position Subject	**A2 [cm^2]**	**Vm_mean2 [cm/s]**	**Q2 [cm^3/s]**
1	0.26	14.20	3.69
2	0.15	24.80	3.72
3	0.25	11.70	2.93
4	0.22	11.40	2.51
5	0.15	16.10	2.42

Table 4. Results of percentage flow rate of artery, students

Subject	**dQ [%]**
1	126.61
2	95.02
3	138.49
4	87.82
5	161.21

Table 5. Measurements of ultrasound, group of cyclists

Rest position Subject	**A1 [cm^2]**	**Vm_mean1 [cm/s]**	**Q1 [cm^3/s]**
1	0.25	17.00	4.25
2	0.21	13.60	2.86
3	0.32	14.40	4.61
4	0.38	10.00	3.80
5	0.26	14.60	3.80

Taping Subject	A2 [cm^2]	Vm_mean2 [cm/s]	Q2 [cm^3/s]
1	0.23	23.50	5.41
2	0.33	11.00	3.63
3	0.38	18.20	6.92
4	0.34	13.60	4.62
5	0.28	16.20	4.54

Table 6. Results of percentage flow rate of artery, cyclists

Subject	dQ [%]
1	127.18
2	127.10
3	150.09
4	121.68
5	119.49

DISCUSSION

The thoracic hyperkyphosis with protraction of the scapulas is caused with the shortness of pectoral minor muscles and weakness of the rhomboids muscles. The upright posture was solved using taping of rhomboids and pectoral minor muscles as recommended (Thelen et al., 2008). After this passive therapy there was the improving of the hemodynamics of the upper limbs at all the cyclists. Taping is a young form of strapping. It is a new procedure that uses tape, attached to the skin, to physically keep in place muscles or bones at a certain position (Kobrová et al., 2012). There is little scientific evidence that elastic therapeutic taping produces clinically significant benefits. A 2012 systematic review found that the efficacy of elastic therapeutic tape in pain relief was trivial given that no studies found clinically important results. The tape may have a small beneficial role in improving strength, range of motion in certain injured cohorts and force sense error compared with other elastic tapes, but further studies are needed to confirm these findings (Williams et al., 2012). There are several theoretical benefits claimed for the tape. One of those is correcting the alignment of weak muscles as well as facilitating joint motion as a result of the tape's recoiling qualities. Additionally, the tape is claimed to lift the skin, increasing the space below it, and increasing blood flow and circulation of lymphatic fluids. Taping is used on massive hematomas. This increase in the interstitial space is said to lead to less pressure on the body's nociceptors, which detect pain, and to stimulate mechanoreceptors, to improve overall joint proprioception (Bassett et al., 2010). It seems that the taping is easy to use universal passive technique than the active therapy.

During the external rotation and adduction of the shoulder the pectorals muscles are elongated and the rhomboids muscles are activated. After this active therapy there was the extension of the thoracic spine at the first and third student. These subjects did the extension of the thoracic spine. Each body solved the strategy for the upright posture individually. It depends on the initial setting of each body segments. The fifth student had the upright posture in the initial and final position. The thorax and clavicle were elevated during the tested movement which led to the improving of the hemodynamics of the upper limbs.

The curvature of the thoracic spine increased only at the fourth student, this subject was not able to create the upright posture, there was hyperextension of the spine and the clavicle was not effectively elevated as the thorax. Kolář (2005) concluded that the balance must be between pectorals and abdominal muscles to stabilize the thorax in the upright position. Faulty case of extension of the spine is elevation of the thorax and anteversion of the pelvis. This posture is called as Opening scissors syndrome according to Kolář, it is caused due to the imbalance between the pectorals, abdominal and dorsal muscles. This situation led to the deterioration in the hemodynamics of the upper limbs.

The second student created the upright posture, but the clavicle elevated and moved anterior less than the thorax. There was a compression of the axillary artery with the first rib on the sonograph. The hemodynamics of the upper limbs decreased. This final posture of this student is called as the Forward drawn posture according to Lewit – there is the hypertension of the gluteal and the paravertebral muscles, the whole body moved forward (Lewit, 2003).

The position of the cervical-thoracic spine and the upper extremities affects hemodynamics of upper extremities. Many authors have described the obstruction of axillary artery during the abduction of arms. Abduction and external rotation of the upper extremities (arms overhead) posterior inferiorly rotate the clavicles and the subclavius muscle fees which enhances tension on the venous drainage and neurovascular supply that diminishes venous return (James D. Collins, 2003). Conversely, the adduction and external rotation of the shoulder leads to the elevation of the clavicle and improving the hemodynamics if the thorax is optimally stabilized according to Kolář (Kolář et al., 2005).

CONCLUSION

Poor posture negatively influences the hemodynamic of the upper extremities and conversely, the upright posture improves hemodynamics of the upper extremities. External rotation and adduction of the shoulder leads to the upright posture, to the extension of the thoracic spine and to the elevation of the thorax and clavicle. If the clavicle was elevated the same or more than the thorax the hemodynamics was improved. Taping as a passive therapy was suitable for all subjects and led to the improving of the hemodynamics of upper extremities. It seems to be generally easier for use than the active exercise which should be done with a physiotherapist to be effective for the hemodynamics.

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AKTIVNÍ A PASIVNÍ TERAPIE NAPŘÍMENÍ A JEHO VLIV NA HEMODYNAMIKU HORNÍCH KONČETIN

IVANA JELÍNKOVÁ, ROBERT VÁLKA & MONIKA ŠORFOVÁ

SOUHRN

Chabé držení těla vede ke změnám nervově-cévního zásobení horních končetin. Toto je popisováno v klinické praxi jako syndrom horní hrudní apertury. Vadné držení těla je doprovázeno svalovými dysbalancemi, které jsou optimalizovány aktivním cvičením nebo s využitím pasivní techniky – tapingu. Tato práce je experimentální pilotní studií, která se zabývá kinematikou a tapingem cervikothorakálního přechodu a jejich vlivem na cévní zásobení horních končetin. Deset probandů (26 ± 2 let, 56 ± 4 kg, 161 ± 8 cm) bez patologie a zranění pletence ramenního a páteře podstoupilo měření. První část probandů (5 osob) prováděla cvičení – zevní rotace paže. Během tohoto cvičení byla snímána kinematickou analýzou (Qualisys) extenze hrudní páteře. U druhé části probandů (5 osob) byl použit taping rhomboideálních a malého prsního svalu. U obou skupin byla použita sonografie k určení krevního toku arterií axillaris. Taping, jakožto pasivní metoda, zlepšuje cévní zásobení horních končetin jednodušeji než aktivní cvičení, které musí být prováděno pod dohledem fyzioterapeuta.

Klíčová slova: hemodynamika, vzpřímené držení, hrudní kyfóza, arterie axilaris, taping

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DEPENDENCE OF THE OVERALL NATIONAL TEAM MARKET VALUE ON ITS SUCCESS AT UEFA EURO 2012

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SUMMARY

The content of this article is to compare overall market values of football national representations which took part in UEFA EURO 2012 in Poland and the Ukraine. The size of team market value is determined by a summarization of all the team players' market value regardless of their participation in matches. The highest market value was achieved by the national team of Spain, the lowest by the national team of Ireland. The overall team market value is related to success (failure) at EURO 2012 which is expressed by a total amount of points gained. There is an evident strong influence of team market value on the result gained at UEFA EURO 2012 based on the results of regression and correlation analysis. The value of correlation coefficient is 0.78.

Another target was determining the effectiveness of national football teams at UEFA EURO 2012 as a proportion of the representation quality and the overall amount of points gained at the tournament. From this point of view the most effective team was the Czech football representation, the least effective was the Dutch representation.

Keywords: football, EURO 2012, market value, effectiveness

INTRODUCTION

A well-worn phrase expressed by both football professionals and amateurs says: "A match starts with the score 0:0." This suggests that the chances of either team winning the match are more or less equal. However, this is only seemingly valid. The chances of winning a match or indeed a whole competition (league or tournament) are influenced by various factors. If we disregard the factor of luck, the most important factor is definitely the quality of the team, i.e., it is determined by the quality of players forming the team. There are eleven players in a football team on the football pitch. However, these players very rarely play for an entire match therefore it is necessary to also consider the quality of the possible substitute players on the bench.

The factor best expressing the quality of players, according to many authors, is mainly their market value (Carmichael, Forrest & Simmons, 1999; Feess & Muehlheusser, 2003; Amir & Livne, 2005; Forker, 2005; Tervio, 2006; Frick, 2007). The value of a player is determined by many indicators. The most important of such are international experience, amount of the latest transfer sum of money and player performance. It is observed via the number of goals shot, the number of accurate or spoilt assistances, the number of kilometers run within a match, the number of manoeuvres, the number of losing or gaining the ball, etc. It then follows that other parameters are valid for goalkeepers, others for defenders, midfielders or strikers. An important indicator is also the age of a footballer, mostly with respect to the length of his assumed career (Hoffmann, Chew Ging & Ramasamy, 2002). Team success can raise the value of a player (for example being promoted into a higher competition or team participation in Champions League). On the other side, market value can be knocked down by serious or repeated injuries (Tunaru, Clark & Viney, 2005).

European league teams can recruit high-quality players from all over the world regardless of their nationality and increase their chances to succeed in national or international competitions. However, national representation teams do not have this possibility as they are allowed only to choose from players of the same nationality. Nevertheless, performance-related differences among European national teams are clear and chances to win a championship title vary. Despite this, we have already experienced many surprise upsets within the history of European championships. Take for instance the triumph of Greece at UEFA EURO 2004 in Portugal or the victory of Denmark at UEFA EURO 1992 in Sweden.

PURPOSE

The aim of this contribution is to determine the dependency of the overall national team market value on its success at UEFA EURO 2012. Another aim is to determine the "effectiveness" of national football teams at UEFA EURO 2012 as the ratio of representation selection quality to the overall result achieved at the tournament. Team quality is given as the total of all players market values regardless of their participation in the match. The team result is given by the overall amount of points gained at the tournament.

METHODS

Subject of the study were national teams participating in the European Championship in Poland and the Ukraine in 2012. First of all, the overall market value of each team was set. It was determined as a total amount of market values of all team players regardless of their participation in all matches. Each team consisted of 23 players – 3 goalkeepers, 7 defenders, 9 midfielders and 4 forwards. A demonstration of a calculation of the overall representation market value is represented on the example of the Czech national team in Table 1.

Table 1. Market values of the Czech representation team players at UEFA EURO 2012

Name	Matches played at EURO	Market value (mil. EUR)
Goalkeepers		
Petr Čech	4	25.00
Jaroslav Drobný	0	1.25
Jan Laštůvka	0	2.50
Defenders		
Theodor Gebre Selassie	4	2.50
Roman Hubník	1	1.70
Michal Kadlec	4	7.00
David Limberský	3	2.00
František Rajtoral	2	2.50
Tomáš Sivok	4	7.80
Marek Suchý	0	3.80
Midfielders		
Vladimír Darida	1	3.00
Tomáš Hübschman	4	3.50
Petr Jiráček	4	6.00
Daniel Kolář	2	1.80
Milan Petržela	1	1.25
Václav Pilař	4	3.50
Jaroslav Plašil	4	6.50
Jan Rezek	3	1.20
Tomáš Rosický	2	3.50
Forwards		
Milan Baroš	4	6.50
David Lafata	1	1.20
Tomáš Necid	0	6.00
Tomáš Pekhart	3	4.00
Overall market value of the Czech team		**104.05**

Source: http://www.transfermarkt.co.uk (adapted by the author)

The market value of each player is set by licensed FIFA agencies and scouting agencies. Parameters such as age, international experience, the latest transfer sums of money and performed sport performances are all taken into consideration.

Overall market value of all players at EURO 2012 was 3845 mil. EUR. This represented an average market value of 10.4 mil. EUR for one player. Therefore it is evident that all players of the Czech national team mentioned in chart 1, except for Petr Čech, had substandard market value.

If we accept the fact that market value is the basic indicator of a player quality, then the overall market value of a national team is the indicator of the whole representation team quality. Market values of national teams participating in EURO 2012 are expressed in Table 2.

Table 2. Teams market values at EURO 2012

Order	Representation	Average player value (mil. EUR)	Overall team market value (mil. EUR)
1.	Spain	27.17	625
2.	Germany	20.65	475
3.	England	18.00	415
4.	Portugal	15.21	350
5.	France	15.00	345
6.	The Netherlands	13.90	320
7.	Italy	13.45	310
8.	Russia	7.15	165
9.	Croatia	6.74	155
10.	Sweden	5.65	130
11.	The Ukraine	4.78	110
12.	The Czech Republic	4.56	105
13.	Poland	4.13	95
14.	Denmark	3.91	90
15.	Greece	3.70	85
16.	Ireland	3.04	70
Overall market value of all teams at EURO 2012			**3,845**

Source: http://www.transfermarkt.co.uk (adapted by the author)

Team quality is the turning factor for success or failure in a competition. The overall market value of representations participating in EURO 2012 therefore indirectly expressed team chances of success in this European Championship.

This means that the biggest chances to win EURO 2012 belonged to Spain because its players had had the highest market value before EURO 2012, specifically it was 625 mil.

EUR (27.17 mil. EUR for a player). The smallest chances to win – with respect to the overall market value – belonged to the Irish team with its market value of 70 mil. EUR (3.04 mil. EUR for a player).

To support this statement one can note a correlation; there is a mutual relationship between the overall national teams' market value and their result at EURO 2012. It will be then set as a total sum of all points gained. The amount of correlation coefficient determines the probability that the above followed quantities are co-dependent, however, it will not be possible to confirm the fact that the total amount of the national team market value is the *cause* and the amount of points gained its *effect*. This cannot be decided by the correlation itself.

The last detail essential for the correlation calculation and the subsequent *effectiveness* as the ratio of representation selection to the overall result achieved at the tournament was the amount of points gained by representations at EURO 2012. The points gained represent the basic indicator of each team success rate at EURO 2012. In the basic group there were 3 points given for a victory, 1 point for a draw and 0 points for a defeat. In elimination matches, for the purposes of our study, teams were given 3 points for ascent and 0 points for elimination, regardless of the match result after the basic playing period of time. Team success rates in points gained are demonstrated in Table 3.

Table 3. Team success rates in points gained at EURO 2012

Representation	Points gained in the basic group	Points gained in play-off	Total amount of points gained
Spain	7	9	16
Germany	9	3	12
Italy	5	6	11
Portugal	6	3	9
England	7	0	7
The Czech Republic	6	0	6
France	4	0	4
Greece	4	0	4
Russia	4		4
Croatia	4		4
Sweden	3		3
The Ukraine	3		3
Denmark	3		3
Poland	2		2
The Netherlands	0		0
Ireland	0		0

Source: http://www.uefa.com/uefaeuro/index.html (adapted by the author)

Besides the overall market value correlation and the amount of points gained there was a calculation of the *national team effectiveness* done as the ratio of the quality of the representation selection to the overall result gained at the tournament. It was calculated as a proportion of the total sum of all players' market values in the national team and the amount of points gained. Simply said, the result expresses how much money one point gained at EURO 2012 "cost".

$$ENT = \frac{\sum PMV}{P}$$

ENT – effectiveness of national team
PMV – player market value
P – number of points

RESULTS

The examined hypothesis about mutual dependence between the size of the national team market value and the result gained in points was put through a two-dimensional linear regression analysis. The results are shown in Figure 1.

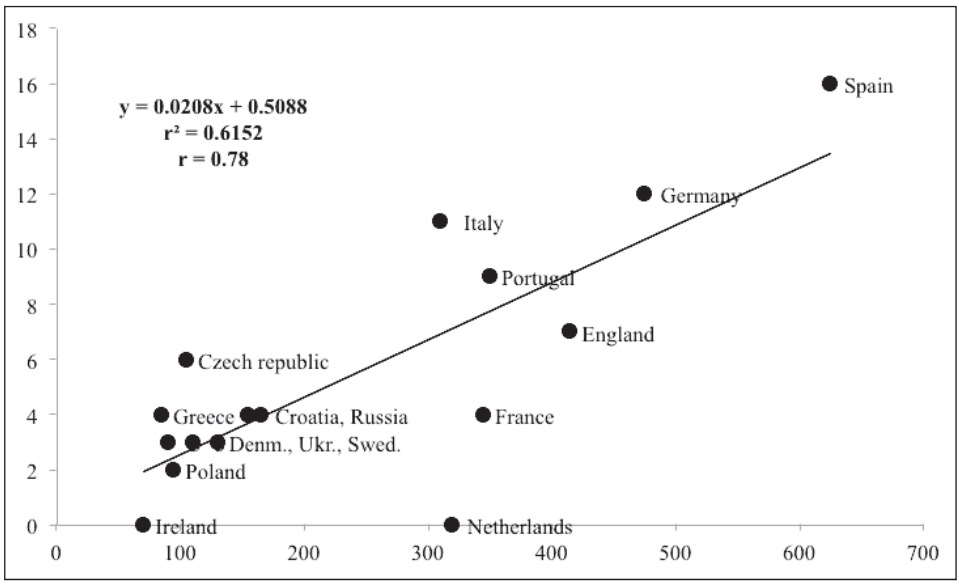

Figure 1. Regression and correlation analysis

Pearson's correlation coefficient gained the value of 0.78 which expresses quite a strong relationship between the national team market value and the amount of money gained. The method of the least squares was used to calculate an equation of a straight

line regression y = 0.208x + 0.5088. It could be interpreted in the way that every other 1 million EUR of the national team market value leads to the achievement of 0.208 points more. In other words approximately 5 million EUR would mean 1 point more in the total sum of points. It is advisable to handle these conclusion carefully because the Pearson's correlation coefficient did not reach the highest possible value 1 and the determination coefficient is 0.6152, so the below mentioned regression straight line explains only 61.52% of range of points gained. Higher amount of money than the regression straight line shows was gained by 10 teams including the Czech Republic. On the contrary, the lowest amount of points was gained by 6 national teams including such football great powers as England, France and the Netherlands. This conclusion is obviously misrepresented by the fact that it is possible to gain only a full amount of points, not points with decimal places. The closest to the predicted amount of points gained is the Russian representation for which the value was y = 3.9408, which is nearly similar to 4 real points gained. On the contrary, the furthest from the regression straight line is the Dutch representation which, in comparison to 7.1648 predicted points, did not get any. It is also necessary to say that this sport failure of the Dutch representation significantly influenced the final correlation coefficient because if the final Dutch result was omitted, the Pearson's correlation coefficient would gain significantly higher value, i.e. 0.88.

The results support the proposition that teams with higher market value have higher chances in gaining success at a tournament. It was obviously not a coincidence that the European title was won by the national team of Spain, i.e. the team with the highest market value. On the contrary the team with the lowest market value ended the last. The last, sixteenth place is not officially declared but the Irish team with three defeats and score 1:9 can be declared the last.

Another aim of this study was to determine the "effectiveness" of national football teams at EURO 2012 as the ratio of total sum of all players market values to their overall result gained at the tournament. The team of the Czech Republic appeared to be the best by this measure. The team market value was substandard in comparison with other teams (105 mil. EUR), however, the Czech representation managed to win twice in group A and ascend to quarter-finals from the first place. One point gained for the Czech Republic *represented* 17.5 million EUR which was the lowest value of all national teams therefore we evaluate it in our measuring as the most effective.

The Dutch team ended in the last place of evaluating effectiveness, mostly because they lost three times in group B and did not get any points. The Dutch team result can undoubtedly be evaluated as a huge failure and even from the above mentioned graph it is clear that this team result represented the biggest distance from the straight line. The national team of Ireland also ended with zero points but with regard to its lowest overall market value, this result, unlike the Netherlands, cannot be evaluated as surprising.

Complete evaluation of national team effectiveness as the ratio of the representation selection quality to the overall result gained at the tournament represented in Table 4.

Table 4. Effectiveness as a ratio of the representation quality selection to the overall result gained at the tournament

Representation	Overall team market value (mil. EUR)	Total amount of points gained	Effectiveness (mil. EUR per 1 point)
The Czech Republic	105	6	**17.50**
Greece	85	4	**21.25**
Italy	310	11	**28.18**
Denmark	90	3	**30.00**
The Ukraine	110	3	**36.67**
Croatia	155	4	**38.75**
Portugal	350	9	**38.89**
Spain	625	16	**39.06**
Germany	475	12	**39.58**
Russia	165	4	**41.25**
Sweden	130	3	**43.33**
Poland	95	2	**47.50**
England	415	7	**59.29**
France	345	4	**86.25**
Ireland	70	0	–
The Netherlands	320	0	–

DISCUSSION

As it was stated above, the correlation coefficient expressing the mutual relationship between the overall national teams' market value and the amount of points gained at EURO 2012 was defined by the amount of **0.78**. This expresses a highly positive dependency. This result is not surprising. High dependency of team quality (expressed in money) as the result gained is proved by other researches (Kesenne, 2000; Zimbalist, 2002; Michie & Oughton, 2004; Goossens, 2005; Groot, 2007; Lee, 2010). However, these researches are oriented mainly at national leagues where the luck factor is not so significant. After all, each team plays a high amount of matches during one season, even though some of them are influenced by chance, team quality manifests in the total number of all matches.

A different situation can be observed at top tournaments where success or failure is determined by only several matches. One such example was the championship in Sweden in 1992 where the national Danish team was very fortunate – even off the pitch! It was the time when the start of the Balkan conflict caused the withdrawal of the Yugoslavian team. Its place was taken by the national team of Denmark, whose players were promptly

gathered from their holidays. Then it was an even bigger sensation that this team with a "mere" three wins took the European title.

Besides the dependency of the national team market value and the result at EURO 2012, in our study we were also evaluating the effectiveness of national teams as a ratio of the representation selection quality to the overall result gained at the tournament. In this evaluation *the most effective* team is the Czech national team and *the least effective* is the Dutch national team. In this relation to this it is necessary to say that the luck (or bad luck) factor played a significant role here, directly during the draw for basic groups. The Czech national team was drawn in group A together with the national teams of Poland, Russia and Greece. The overall market value of these four teams was 450 million EUR which is more than twice less than of the remaining groups. Total sums of team market values are expressed in Table 5.

Table 5. Total sum of team market values in basic groups at EURO 2012

Group	Order in group	Team market value (mil. EUR)	Total sum of market values (mil. EUR)
A	**1. The Czech Republic**	105	**450**
	2. Greece	85	
	3. Russia	165	
	4. Poland	95	
B	**1. Germany**	475	**1,235**
	2. Portugal	350	
	3. Denmark	90	
	4. The Netherlands	320	
C	**1. Spain**	625	**1,160**
	2. Italy	310	
	3. Croatia	155	
	4. Ireland	70	
D	**1. England**	415	**1,000**
	2. France	345	
	3. The Ukraine	110	
	4. Sweden	130	

Source: http://www.uefa.com/uefaeuro/index.html (adapted by the author)

From the table it is evident that any team ascending from group A would show a high amount of *effectiveness*. With respect to the draw it had been clear in advance that the ascending team would be the team with the overall market value of max. 105 mil. EUR.

It is therefore not surprising that the first two places in the effectiveness of national representations were taken by the Czech and Greek teams, i.e. ascendants from group A.

On the contrary, three teams were drawn in group B, i.e. "the death group", with their market value of minimum 320 mil. EUR, therefore it was clear that one of these teams was prevented to ascend from the group. Finally, this was the destiny of the Dutch team, which ended in the last place of our effectiveness measurement.

From Table 5 it is also evident that, except for group A, the teams with the highest overall market value in the group always ascended and also that from the nine teams with the lowest market value only the Czech and Greek teams ascended.

CONCLUSION

From the result it is evident that the influence of the market value on the team result at EUR0 2012 was significant. The relationship between team market value and points gained was highly positive. The correlation coefficient value was 0.78. Hypothetically, if the rather unsuccessful Dutch team had been eliminated from the study, the correlation coefficient could have been up to 0.88.

Final statement "the higher market values, the more points gained" can be also interpreted that rewarding football players by special licensed agencies is very reasonable. Players' market values probably very significantly reflect their real performances. A confirmation of this hypothesis would require much more extensive analysis.

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ZÁVISLOST VELIKOSTI TRŽNÍ HODNOTY MUŽSTVA NA DOSAŽENÉM VÝSLEDKU NA ME VE FOTBALE 2012

JAN ŠÍMA, TOMÁŠ RUDA & VILÉM OMCIRK

SOUHRN

Obsahem článku je porovnání celkových tržních hodnot fotbalových reprezentací, které se účastnily ME ve fotbale v roce 2012 v Polsku a na Ukrajině. Velikost tržní hodnoty týmu je dána součtem tržních hodnot všech hráčů v týmu bez ohledu na to, zda do utkání nastoupili, či nikoliv. Nejvyšší tržní hodnotu měl reprezentační výběr Španělska, nejmenší pak tým Irska.
Celková tržní hodnota týmů je dána do souvislosti s úspěchem (neúspěchem) na ME 2012, který je vyjádřen celkovým počtem získaných bodů. Z výsledků regresní a korelační analýzy je patrný silný vliv tržní hodnoty týmu na dosaženém výsledku na EURO 2012. Hodnota korelačního koeficientu je 0,78.
Dalším cílem bylo určení efektivity národních fotbalových týmů na EURO 2012 jako poměru kvality reprezentačního výběru a celkového počtu dosažených bodů na turnaji. Z tohoto pohledu nejefektivnějším týmem byla česká fotbalová reprezentace, nejméně efektivní nizozemská reprezentace.
Klíčová slova: fotbal, EURO 2012, tržní hodnota, efektivita

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SHAPE MANIFESTATION OF RESPIRATION IN THE AXIAL SYSTEM

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SUMMARY

The aim of the study was to evaluate the effect of respiration on the shape changes of the axial system. Our approach focuses more on the analysis of respiratory function and their implementation within the complex axial system – the trunk. The results of this pilot study will use as evidence for further study of relationship between respiration and physiotherapy. Now we are looking for an answer to the question, at what level of the human body reflected the influence of respiration and its use in physiotherapy.

This pilot study was attended by two women and one man aged 25–40 years, who were not selected for the study according to predetermined conditions. The same characteristic features of all three prarticipants were sedentary job connected with excessive mental strain, occasional low back pain (usually after a long sitting) and the absence of acute or chronic respiratory diseases. Another common feature of the participants was the absence of structural changes in the spine. During the experiment was monitored maximum inhalation and maximum exhalation, and respiratory maneuver Kapalabhati, often used as one of the basic yoga breathing exercises. To detect trunk movement during the respiratory maneuver, we opted for a Qualysis – 3D torso topography. At the same time spirometer panned changes in volume over time, both exhaled and inhaled air.

The purpose of this study was to assess symptoms and implementation of respiratory maneuvers in the axial system, particularly the chest and abdominal area. During the experiment, we followed the differences in reaction of the chest and abdomen in respiratory maneuver in the direction vertical, antero-posterior and lateral. The difference in these indicators at different phases of the respiratory maneuver confirms our assumption of the possibility of influencing the selected folders axial system through appropriately selected respiratory maneuver. After processing of the measurement results, we found a significant superiority of the realized movement in the abdomen compared to the chest region, although this is more a 3D movement, which is given by the kinematic motion of the ribs to the sides. Movement is therefore spatially complex. Spirometric evaluation of the identified volumes is consistent with the measured changes in the shape of the trunk. Overall, it is not necessary to evaluate the results statistically, but case reviews – compare always "formula" realization of the respiratory maneuver that person.

Keywords: diaphragm, posture, body shape, mobility of the spine, breathing dynamics, 3D motion analysis, spirometer

INTRODUCTION

The shape of chest skeleton together with construction and connection of bones forms structural conditions for the realization of respiratory movements. Thoracic spine movements affect the dynamics of breathing; respiration affects spine dynamics. For physiological resting breathing is critical complex chest wall muscles, diaphragm and abdominal wall (Dylevský, 2009).

Movement of the ribs and costovertebral and costotransverzal articulation and elevation of the ribs caused by increasing the transverse diameter of the lower part of the chest and anteroposterior diameter upper chest already described Kapandji (1974).

Many research studies have focused on kinesiology point of view, which is a coordination of muscle activity in respiration. The diaphragm itself by its function can magnify all three diameters chest (frontal, sagittal, transverse), and therefore is itself able to perform all the basic functions on the inhale (Véle, 1997). Despite some dominant diaphragm is just one part of a functional complex inspiratory trunk muscles, containing also abdominal muscles and pelvic muscles (Dylevský, 2009). The respiratory muscles are used during inspiration. The inspiration performing work of breathing, which has three components: the work necessary to overcome lung retraction forces, overcoming the resistance of lung tissue and overcome current resistance which put respiratory failure. (Trojan, 2003; Navratil & Rosina, 2005; Slavíková, 2002).

Abdominal muscles can be described as expiratory muscles, which operates mainly in the active expiration (the resistance in the airways) by displacing abdominal organs into the diaphragmatic dome and piston mechanism expel air from the lungs. Most apply mm. obliqui abdominis and m. transversus abdominis (Dylevský, 2009).

Kapalabhati, breathing exercises used in the experiment is based on active exhalation, which is fast and sharp, and conversely passive, slow breath. Kapalabhati consists of short doses sharply exhaled air, followed by passive inhale (Lysebeth, 1999; Dostalek, 1996).

Kapalabhati begins a sharp, forceful exhalation, downloading abdominal muscles. The air pushes loudly blowing by nose. The mouth is closed all the time. After exhalation breath is not holding, releasing

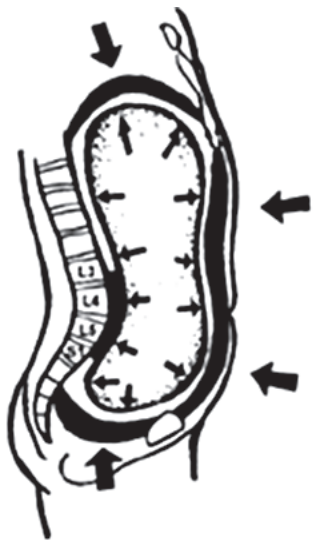

Figure 1. Muscle interaction between autochtonous muscles, diaphragm, muscles of the pelvic floor and abdominal muscles in physiological situation (taken from Kolar & Lewit, 2005)

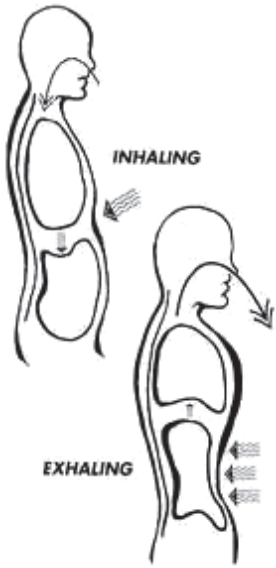

Figure 2. Kapalabhati
(taken from www.take-root.com)

the abdominal muscles, the air is automatically sucked into the lower and middle parts of the lungs (Kogler, 1971).

Kapalabhati is purely diaphragm type breathing, chest has an important role in that it remains completely immobile. Before training the chest off, and should stay in position of the inhale with ribs splayed. During the exercise can be seen a movement of the lower ribs. The movement is passive and unavoidable hence it is induced by pulling the abdominal wall muscles, associated with these ribs.

The diaphragm is very intensely involved here, but passively. The main movements creates abdominal wall, which compresses the internal organs back and up so the diaphragm is activated – the internal organs through activation of the abdominal wall. The diaphragm is active**,** but muscles don't contract (Lysebeth, 1999).

It starts with 12 to 15 breaths, then the number is 60, the maximum is 120 active breaths per minute (Hajek et al., 2000). Exhalation takes about two tenths of a second, breath varies from eight to three tenths of a second to the rhythm in which the exercise is performed (Lysebeth, 1999).

METHODS

Qualysis

The system is Qualisys optoelectronic system for 3D motion analysis. The main task is the creation and subsequent kinematic analysis of motion of the object. It uses the camera's own high-precision tracking of the object using passive or active markers.

Labeled markers and evaluated parameters are chosen to define the behavior of individual breathing phases, their location and time sequence. We can concentrate on symmetry made movements, their implementation in the chest, abdomen or overall impact on the shape of the spine, etc.

To assess the implementation of the breath in the thoracic and abdominal parts of the axial system we started the reconstruction of the horizontal trunk transverse section of vertebrae Th9 for the realization of the breath in the chest, and for assessing the functional involvement of abdominal incision of vertebra L3. As the basis of realized breath movements was chosen pelvis, represented by the front and back pelvic spins in both sides.

The results are for better predictive value the parameters such as the anterior-posterior dimension, the lateral width of the selected section in percent (100% represents the size

of the monitored person in maximum inspiration). Furthermore are evaluated the relative positions of selected slices – in three dimensions, in particular vertical offset.

In the pictures are shown the parameters evaluated marker of left pelvic spins (SIAS) and the marked point at the height of the front left Th9 vertebra to the rib cage. Monitored was the mutual vertical distance of the axis Z (see Figure 3) and sagittal move of the cut at axis Y (see Figure 4).

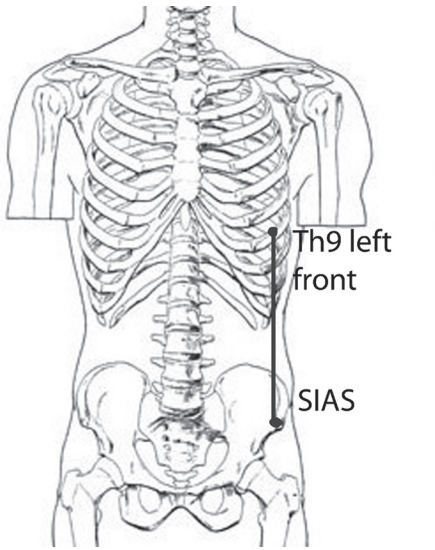

Figure 3. Vertical shift Th9 – SIAS

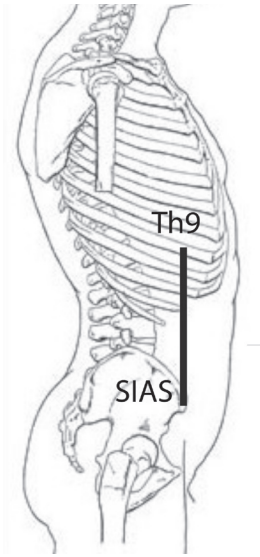

Figure 4. Sagittal shift Th9 – SIAS

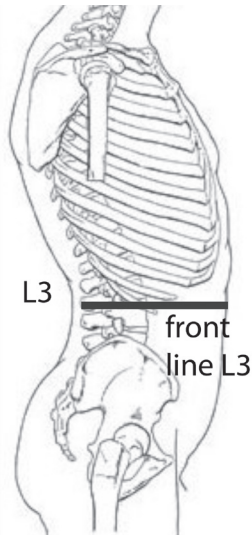

Figure 5. Sagittal shift L3

Similarly, the situation has been evaluated in the abdomen, in the text are displayed parameter evaluated within a reconstructed slice.

At the same time we have to assess respiratory function used spirometric measurements. This on-line measurement allows us to bind each other topographic parameters describe breathing movements with the current volumes change, including the dynamic parameters. Of course it is possible to compute standard rated parameters observable for the respiratory maneuver with standard spirometry.

Monitored parameters were still breathing, maximum inhale and exhale, short and strenuous exhales (Kapalabhati).

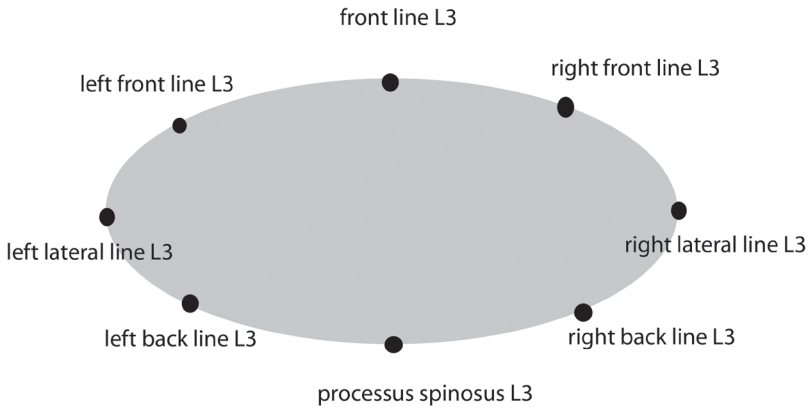

Figure 6. Diagram of reconstructed slice

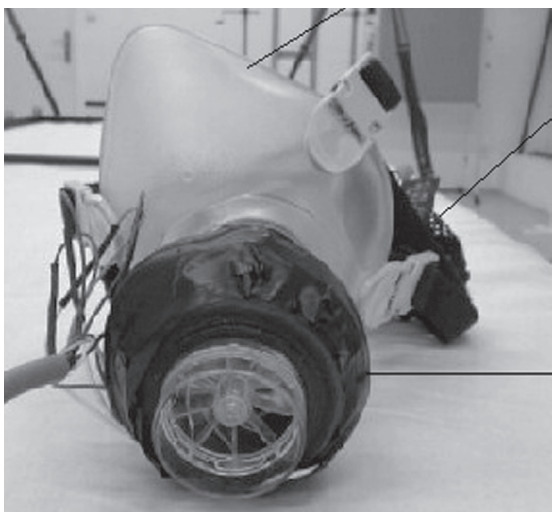

Figure 7. Spirometer

RESULTS

Changes of transverse dimension of the trunk in the sagittal direction changes over the maximum inhale and exhale a maximum of 9%. There is significantly bigger movement in the area of the abdomen (slice L3), where the average value is 6.6%. In contrast, in the region of chest (slice Th9) there are similar displacements in case of the maximum breathing for about 3.5% – or about half value of changes in the abdominal area. From the analyzed breath cycles, we can hypothesize that the shape changes in the antero-posterior direction within one tidal cycle is always bigger in the abdomen than the chest.

In the case of Khapalabhati we have found this phenomenon even more pronounced. The higher value of changes of transverse dimensions seen in the direction of antero-posterior in the region of the abdomen (4.3%) compared to the values of the chest region (0.4%), where it is not carried out almost no movement.

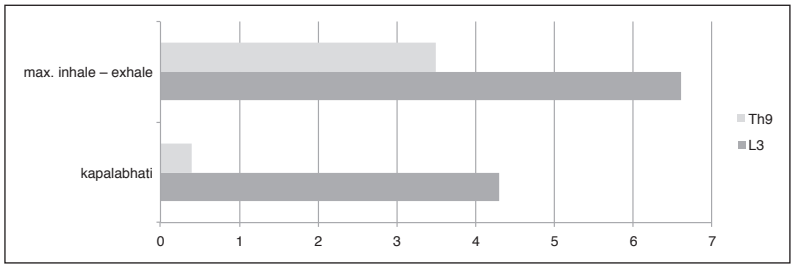

Figure 8. Anteroposterior dimension cut L3 (red) and Th9 (blue) at a chosen breath maneuver

Variability of measured values for each person is listed in the following table. Basic trends are repeated, deflections in the abdominal area are at all three participants more significant than in the chest.

Table 1. Percentage of the measured values of each proband

antero-posterior direction	max inhale–exhale	kapalabhati
proband 1 – Th9	4.5	0.8
proband 1 – L3	9.1	5.9
proband 2 – Th9	1.2	0.3
proband 2 – L3	3.6	2.1
proband 3 – Th9	4.8	0.2
proband 3 – L3	6.9	4.8

The movement in the lateral direction was significantly smaller than in the antero-posterior direction. Minimum cross-sectional area change in the lateral direction, we've detected primarily in the region of the abdomen even if the case of maximal inhale and exhale.

Values fall within the measurement errors (about 2 mm). Measurable values shall extend of chest laterally only at maximum inhale and exhale.

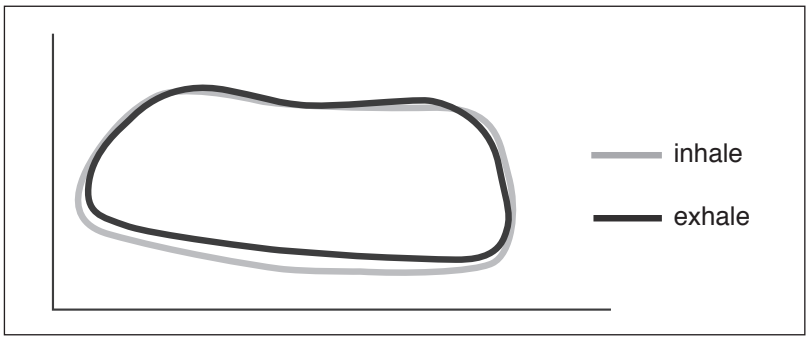

Figure 9. Display horizontal slice of the thorax vertebrae Th9 Position in breath (blue) and expiration (red)

Measured value of the shift point on the front of the chest of Th9 vertebra to the anterior pelvic spins are averaged 14.6% in the vertical direction and about 4.6% (higher variability of results) in the anteroposterior direction. It's always a movement within one tidal cycle and 100% is the vertical distance at maximum inspiration. Values therefore describe the spatial movement chosen cut during tidal cycle.

The evaluation of the breathing volumes is in accordance with the measured changes in the shape of the trunk. The average value of the volume during maximal respiration is 3.2 liters. Its variability – repeated for four times – was up to 40%. In case of Kapalabhati, the breathing volume was reduced to approximately 0.7 liter only (i.e. to about 22% of the maximum breathing volumes of reference person).

Variability of breathing cycles is not possible any indication of a functional state. It is a process driven CNS and carried out a number of subsystems, the consistency of the by no means required.

DISCUSSION

The task of this study was to perform an experiment using 3D motion analysis Qualisys, supplemented of spirometry measurement. Both of these measurements were evaluated separately, because the time of spirometry measurements don't agree the time interval of Qualysis, data is not synchronized.

Qualysis system provides data from which it is possible to evaluate a large number of parameters, the mutual distance markers and dependence on time. Within the scope of this study, the parameters were chosen few. Mainly those in which markers were well captured by cameras and data could thus be complete. It was interesting to watch the individual response the chest and abdomen on respiratory maneuvers Kapalabhati and deep breathing. The results confirm and tell us about individual response all probands to individual maneuver.

Qualysis can help diagnose the musculoskeletal system at the level of structural or functional disorders. For example, scoliosis curvature of the spine or formation of muscle

imbalances in the upper trunk and changes related to breathing stereotype. It is likely that in the long term application of respiratory maneuvers, such as every day, the result would be more visible, which could be the subject of further research.

The results of spirometry or Qualysis are not significant. They cannot be compared with each other because only one measurement was carried out. By this time, no published studies, neither the Czech Republic nor in the world, dealing with the influence of Kapalabhati the trunk shape changes and changes in lung volumes. Kapalabhati already been the subject of several studies, mostly from the Indian experts dealing with the impact Kapalabhati of the alveolar concentration of carbon dioxide (Kuvalayanand & Karambelkar, 1958) levels of urea, creatinine and tyrosine (Desai & Gharote, 1990), Stančák, Kuna, Srinivasan and Dostálek (1991) found out the changes in the EEG. These and many other studies are focused on change and affecting the function of the internal organs of the abdominal cavity and chest. The reason more internal focus of these studies can be an influence on the digestive tract, pelvic organs and the heart through activation of the diaphragm and abdominal muscles and thus changes in intra-thoracis and intra-abdominal pressure.

In further work, we want to focus on the analysis of the maximal respiration and its detection in the case of urgent axial system difficulties. We want to focus to analysis of respiration movements persons with permanent deformity of the body (for example scoliosis). As a result of restrictions of shape and function in the region of axial system we expect different spirometry parameters and their dynamics and also a different implementation in the framework of cooperation-chest-abdomen – pelvis – diaphragm.

ACKNOWLEDGEMENTS

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TVAROVÉ PROJEVY RESPIRACE V RÁMCI AXIÁLNÍHO SYSTÉMU

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SOUHRN

Cílem práce bylo zhodnotit vliv respirace na tvarové změny axiálního systému. Náš přístup se zaměřuje podrobněji na analýzu dechových funkcí a jejich realizaci v rámci komplexu axiální systém – trup. Výsledky této pilotní studie využijeme jako poznatky pro další studium vztahu respirace a fyzioterapie. Nyní hledáme odpověď na otázku, na jaké úrovni lidského těla se odrazí vliv respirace a její využití ve fyzioterapii.
Této pilotní studie se zúčastnili dvě ženy a jeden muž ve věku 25–40 let, kteří nebyli vybráni do studie podle předem daných podmínek. Shodnými charakteristickými rysy všech 3 probandů bylo sedavé zaměstnání spojené s nadměrnou psychickou zátěží, občasnou bolestí bederní páteře (nejčastěji po dlouhodobém sezení) a absence akutního či chronického onemocnění dýchacích cest. Dalším společným prvkem účastníků byla absence strukturálních změn v oblasti páteře. V experimentu byl sledován maximální nádech a maximální výdech a také respirační manévr Kapalabhati, často používaný jako jeden ze základních jógových dechových cvičení. Pro detekci pohybu trupu během respiračního manévru jsme zvolily popis 3D topografie trupu metodou Qualisys. Zároveň byla spirometrem snímána změna objemů v čase, a to jak vydechovaného, tak nadechovaného vzduchu. Smyslem této studie bylo posoudit projevy a realizaci respiračních manévrů na axiální systém, především hrudní a abdominální oblast. Během experimentu byly sledovány rozdíly v reakci hrudníku a břicha při respiračním manévru ve směru vertikálním, předozadním a laterálním. Rozdílnost v těchto ukazatelích při jednotlivých fázích respiračního manévru nám potvrzuje předpoklad možnosti ovlivnění vybraných složek axiálního systému prostřednictvím vhodně zvoleného respiračního manévru. Po zpracování výsledků měření byla zjištěna výrazná převaha realizovaného pohybu v oblasti břicha oproti regionu hrudníku, i když zde má pohyb více charakter 3D, který je dán kinematickým pohybem žeber do stran. Pohyb je tedy prostorově komplexnější. Spirometrické vyhodnocení zjištěných objemů je v souladu s naměřenými změnami tvaru trupu. Celkově je nutné hodnotit výsledky ne statisticky, ale kazuisticky – porovnávat vždy „vzorec“ realizace daného dechového manévru danou osobou.

Klíčová slova: bránice, postura, tvar trupu, pohyblivost páteře, dynamika dýchání, 3D analýza pohybu, spirometr

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COMPARISON OF ATHLETICS RECORDS OF INTELLECTUALLY DISABLED PERSONS WITH RECORDS OF INTACT ATHLETES

PAVEL TILINGER

SUMMARY

Comparative studies between intact and ID (Intellectually Disabled) individuals have been carried out in many areas (psychic, somatic characteristics, motor skills of individuals with ID, comparison of the level of intellect and motor performance). The study compares the records of intellectually disabled athletes with the records of majority population athletes. For comparison, we have used the existing world records registered by the International Association of Athletics Federations (IAAF), and Inas, (International Sports Federation for Persons with Intellectual Disability). To compare the best Czech records with world records, the best performances of women registered by the ČSMPS (Czech Sports Association for the Mentally Handicapped) were used. If we compare the World Records (IAAF and Inas), we can find differences ranging from 8.2 to 45.3%. The differences between intact and intellectually disabled men are approx. by 2 to 10% lower than in women's similar events. It is only in three events that the differences between intact and ID are slightly lower in women than in men (high jump, discus throw, javelin throw).

The smallest differences between the IAAF and Inas records are in sprints events and middle running distances of men and women (10% men, or 15% women respectively). The differences in long distances reach 18% (men) and 23% (women). The differences in jumping events are very different, accounting for 20% for men and 24% for women with some generalization. Throwing events for practically both sexes bring differences above 40% (except for shot put).

Key words: Inas, ČSMPS, IAAF, Comparison of Performance, Intellectually Disabled

INTRODUCTION

Sport of the disabled has presently become an integral part of social life of modern society. Our study is devoted to sport practised by intellectually disabled (ID) athletes who are able to participate in sports activities from the lowest to the highest performance level within numerous sports associations. At the national level, ID athletes are organised in the Czech

Sports Association for the Mentally Handicapped (ČSMPS), or the Czech Movement of Special Olympics (ČHSO). At the international level, there are also two large organisations associating athletes with intellectual disabilities, Inas (International Sports Federation for Persons with Intellectual Disability) and SOI (Special Olympics International).

Inas organises sports competitions according to the rules of international sports federations (IAAF, FINA, FIBA, FIFA etc.) with practically minimal modifications of the rules with respect to athletes' handicaps. For this reason, the comparison of performances – world records registered by the International Association of Athletics Federations (IAAF) and the Inas federation was chosen for our comparative study, and to compare the world level with the national, Czech, level, we used Czech national women's records registered by the ČSMPS association, which is the Inas member.

Intellectual disability

While defining the term of intellectual disability (ID) a number of definitions may be encountered differing, in particular, by the professional orientation of their authors. In their majority, they share the emphasis on the overall reduction of intellectual abilities of an individual, or his/her adaptability to the environment. The definitions of ID (Slowík, 2007) nearly always attempt to distinguish an individual with ID from an intact individual by enumerating a list of deficits. Doing this, there is, in any case, a need to preserve the multidimensional approach which includes information about intellectual functions, considers the criterion of etiology, social adaptability, corresponds to pedagogic intentions, etc.

In the Pedagogic Dictionary (Průcha, Walterová & Mareš, 2003), ID is defined as a permanent reduction of intellectual abilities caused by an organic brain disorder leading to a different development of some psychic characteristics and to disorders in adaptation behaviour.

In this light, the most significant features of ID include the following (Fischer & Škoda, 2008):

- a low level of mental capacity manifested above all by impaired adaptation to common living conditions,
- the disability is inborn, a child does not develop in a standard way like intact individuals since the very start of their life,
- the disorder is permanent, although depending on the etiology some improvement is possible.

The upper limit of achievable development of each person with ID results both from the severity and cause of disability, and the individually specific suitability of the surrounding environment's action, i.e. educational and therapeutic effects.

The fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR, 2000, p. 41) published by the American Psychiatric Association in 2000, describes the basic feature of ID as:

"… below average general intellectual functioning (criterion A) accompanied by limitations in adaptive behaviour in at least two of the following areas of skills: communication, grooming, living, interaction, using community resources, decision making and choice, education, work and employment, leisure time, health, safety (criterion B). It must originate before the age of 18 (criterion C)."

According to Vágnerová (2004, p. 289) ID is:

"… a general definition for an inborn disability affecting mental capacity manifested by the inability of understanding the individual's surroundings and adapting to it to the required extent. It is defined as the inability of reaching the corresponding level of intellectual development (less than 70% of the norm) despite the adequate educational stimulation of the disabled individual. The principal features of mental retardation are insufficient development of thinking and speech, limited learning ability and resulting more difficult adaptation to common living conditions. The limited development of mental abilities tends to be connected with the impairment or a change of other abilities and with differences in the personality structure."

The Inas federation requires the fulfilment of prescribed primary ID criteria for athletes to participate in competitions, by meeting the criteria athletes become eligible for competitions within the Inas federation.

The primary eligibility criteria applied by Inas are based on the definition of intellectual disability formulated by the American Association on Intellectual and Developmental Disability (AAIDD, 2002). This interpretation is similar to the interpretation by the World Health Organisation (WHO, 2001) and reads as follows:

Intellectual disability is a disability characterised by significant limitations both in intellectual functioning and in adaptive behaviour as expressed in conceptual, social and practical adaptive skills. This disability originates before the age of 18.

The primary eligibility criteria of Inas (www.inas.org) for competing in sports events for the intellectually disabled based on the above definition are:

a) Significant impairment of intellectual activities. This is defined as 2 standard deviations below the average, which means the total score of 75 or below.

b) Significant limitations in adaptive behaviour manifested in conceptual, social and practical adaptive skills. This is defined as a performance which is at least by 2 standard deviations below the average in either: one of the following 3 types of adaptive conceptual, social behaviour or practical skills or the total score of standardised measurement of conceptual, social and practical skills.

c) Intellectual disability must become evident during the development stage from the conception to the completion of 18 years of age.

The diagnosis of intellectual disability must be established using internationally recognised and professionally administered IQ tests approved by Inas.

The diagnosis of adaptive behaviour must be made using internationally recognised and professionally performed standardised measurements containing standards for the intact population, including the population of persons with disabilities.

Athletes must comply with all 3 component parts of criteria to become eligible for participation in sporting activities of the intellectually disabled. Experience shows that the participants of Inas competitions are predominantly athletes whose IQ is in the area of mild mental retardation, or moderate intellectual disability, in the IQ range of 50–55 to 70–75.

Comparative studies between ID and intact individuals have been carried out in many areas (e.g. **psychic, somatic characteristics, motor skills of individuals with ID, comparison of the level of intellect and motor performance**).

Despite some specificities of **psychic characteristics and the mental development** of persons with moderate ID, these are basically regulated by the same development rules as

in intact individuals, but individual functions obviously appear later and development stages take longer (Kvapilík & Černá, 1990). A disharmony between the psychic and biological development arises (Výšková, 1982); the differences between individuals with ID and intact persons in the psychic domain are much more prominent than in the motor domain (Graunke & Schmidt, 1983).

Their mental capacity usually does not develop on an intact biological basis, which results not only in imperfections of nearly all mental functions, but also in the insufficient development of personal qualities manifested by reduced activity, a lack of independence and increased dependence, social immaturity, a lack of willpower, reduced level of self-criticism, etc. The above symptoms, however, according to Výšková (1982), need not always be manifested to their full extent.

The total disruption of the neuropsychic development is related to numerous specificities in the mental capacity of the personality of individuals with ID. The disorder affects cognitive processes, perception, attention, imagination, memory and thinking, it impairs the emotional as well as volitional sphere influencing adaptability and behaviour (Lejčarová, 2012).

Individuals with ID are characterised by the lack of initiative, inability to control their acts, overcome the smallest obstacles and persist in doing some activity for a longer time, by concentration on material and short-term goals of their acts (Langer, 1996), low frustration tolerance and hypobulia (reduced volitional competences). In the decision making stage, these individuals tend to prefer the currently more attractive motive; in the volitional act, i.e. in reaching the goal, especially if it is a long-term one, self-control is their persistent problem and they are easily distracted by other, current motives (Vágnerová, 1993).

The **somatic development of individuals** with ID is, according to Van der Schoot (1977), usually by two to four years below the norm; in this respect, individuals with moderate ID quite resemble their peers, while individuals with more severe ID levels fall behind them (Horvat, 1990).

The physical development of an individual is in a close, dynamic relation to the development of the higher nervous activity so that each severe disruption in this domain may be reflected by somatic changes. There is practically no consensus among authors concerning the body height and body weight indicators of ID and their comparison with intact individuals.

The results of the majority of studies evaluating anthropometric indicators of individuals with ID lead to conclusions that "the occurrence of obesity in this population is high and, in fact, it may be twice higher than in intact peers" (Pitetti, 2002, p. 3). Eichstaedt, Lavay (1992) claim that obesity in the child population with ID is a problem mainly in children with a more severe ID level and with Down's syndrome. The occurrence of obesity (amount of body fat) is higher in women than in men with ID (Rimmer, Braddock & Fujiura, 1994), which is a finding that also holds true for the intact population.

Numerous studies surveyed the relationship between the occurrence of obesity and the ID level. Rimmer, Braddock and Fujiura (1994) discovered that the amount of body fat grows with the falling ID level (in the direction from profound to moderate ID). The same relationship was also discovered for the height and weight (Kelly, Rimmer & Ness, 1986).

Kreze et al. (1974, in Kelly, Rimmer & Ness, 1986) surveyed the relationship between obesity and IQ in adult workers who were divided into the low, average and above average

category by their IQ. The results indicate a strong inverse relationship between IQ and obesity in women and a similar, though less distinct, trend in men.

Motor disorders or deficiencies of persons with ID cannot be formulated in general and generalised. In this respect, their typical motor behaviour cannot be identified either as the locomotor activity of each such individual is characterised by the appearance of highly diverse specificities depending on the level and etiology of the disability, the effects of the environment and the age. According to empirical findings (Kiphard, 1992), about 70% of children with ID develop disorders or striking features in their motor behaviour – their motor activity may principally be at the "normal" or even above average level, but also at a below average level with the occurrence of pathological forms (Mühlinghaus, 1996). Moreover, we may never unambiguously identify whether the disturbed motor activity is the cause or the consequence of these individual' disability (Paul, 1982).

Individuals with moderate ID are limited – mainly in games and sports activities – in the generalisation of locomotor programmes, i.e. an ability of applying mastered locomotor rules in changing situations, in anticipation (Theile, 1974) and integration of locomotor activities into the general structure of the rules of games, tactics and sporting behaviour (Horvat et al., 2003). The lack of intellect is also reflected in the choice of adequate and efficient movements and in the performance of unsuitable and risky exercises in locomotor activities (Kábele, 1988). These individuals are usually not persistent in locomotor activity, they are not able to force themselves to overcome difficulty, indolence or even laziness. Another unfavourable factor is the lack of interest in physical exercise (Černá, 1985).

Professional literature frequently points out the links between **motor activity and intelligence** which were unclear for a long time. Up to now, diverse opinions and assumptions have been formulated ranging from the assumption of a strong parallelism to absolute independence of the both phenomena. It may generally be said that that in early childhood intelligence and motor activity are very closely interrelated, with growing age, however, this correlation dramatically weakens (Schilling, 1980), while with falling intelligence it grows – motor activity is more frequently and more severely disturbed (Kusano & Gohara, 1990). In intact individuals, no correlation between intelligence and motor activity may usually be identified at all (Schilling, 1987).

Besides, there is a substantially closer relationship between intelligence and motor performances which require the simultaneous integration of visual, kinesthetic and vestibular stimuli (e.g. in tasks aimed at dynamic or static balance skills) and thus the coordination of several partial movements in space and time than between cognitive performances and tasks with low demands for the complexity and difficulty of movements (Graunke & Schmidt, 1983).

The links between motor and intellectual performances are also manifested by the positive effect of physical exercise and psychomotor stimulation of children with ID on their cognitive development (Croce, Horvat & Roswal, 1993). In no case, however, do research studies dealing with these issues produce evidence for a close causal relationship between motor activity and intelligence as motor development in particular may be affected by most diverse conditions of the surrounding environment. Therefore, no direct parallelism between motor retardation and lower intellect can be proved.

Comparison of the motor performance level of individuals with intellectual disability and intact individuals.

There are presently large quantities of data from empirical investigations available which identify the differences in the motor performance of children with moderate ID and intact children of similar chronological age.

In terms of the structure of motor skills, no basic differences against the intact population were identified in individuals or children with ID (Dobbins & Rarick, 1975). Therefore, they possess a differentiated structure of motor skills with no significant changes within a given age category, but only slight differences between the sexes. If an individual with ID fails in some area of motor activity, this does not unconditionally mean that he/she will also score low in tests of other motor skills (Sherrill, 1998).

Compared to their intact peers, individuals with ID reach a lower level of motor performance (Frey et al., 1999). As Lejčarová sums up (2012), the greatest differences are found at the locomotor coordination level, i.e. in motion accuracy, agility, dexterity, in balance skills, reaction speed, orientation in space and time, distance estimation, laterality and rhythmic skills; there are also differences in fitness skills – mainly in endurance, force and velocity skills. Gross motor skills are generally less affected than fine motor skills and locomotion.

Insufficiencies in motor activity are more frequently found in younger individuals or children with ID, and its level improves with growing age (Černá, 1985). At the same time, however, the differences between persons with ID and their intact peers get bigger with age as the motor development of a healthy individual is much faster (Rarick, Dobbins & Broadhead, 1976).

The results of research dealing with the motor performance of individuals with ID (Lejčarová & Tilinger, 2002, 2004, 2007) emphasise the urgent need for adequate care for the motor activity of pupils at practical primary schools (PPS), or children with ID. The deficiencies identified in their motor activity may be considered a serious, but not insurmountable, barrier to their locomotor cultivation as there is no doubt that even children with ID are endowed with plenty of qualifications for the development of their locomotor skills within their disability. The lower level of their motor performance cannot be perceived only from the perspective of their mental insufficiency and related personality characteristics, but also from the perspective of external conditions which represent, e.g. the physical education process at PPS, the family, etc. It has been manifested (Krejčí, 1998) that the level of motor performance of children and youth with ID may be significantly positively affected by regular physical exercise or a training programme under professional guidance.

METHODOLOGY

To compare the performance levels in athletics we used the values of currently valid world records of the International Sports Federation for Persons with Intellectual Disability – Inas and compared them against currently valid records registered by the International Association of Athletics Federations (IAAF) and the national Sports Association for the Mentally Handicapped (ČSMPS). The world records (IAAF) of intact athletes represent 100% in our comparison, and the world records of the intellectually disabled, or the national ČSMPS records respectively, are calculated as percentages of the IAAF records.

The percentage represents a real comparison, while in times "worse times" are presented as "higher percentages", which is illogical; this is corrected in the column "Difference in %" – a difference in performances between the compared world records of intact (IAAF), intellectually disabled (Inas) and national records of intellectually disabled (ČSMPS) women. (Athletic records of men are not registered by ČSMPS). The assessment of differences was performed using content analysis of identified facts.

RESULTS AND DISCUSSION

Table 1. Comparison of athletic performances – world records (Inas) of individuals with intellectual disability with world records of intact athletes (IAAF) – men. IAAF and Inas records were valid as of 31. 12. 2011 (performances are in s, min, m)

Event MEN	World record Inas	World record IAAF = 100%	% share	Difference in % Inas/IAAF
100 m	10.68	9.58	111.5	–11.5
200 m	21.45	19.19	111.8	–11.8
400 m	46.72	43.18	108.2	–8.2
800 m	1:49.91	1:41.01	108.7	–8.7
1500 m	3:54.07	3:26.00	113.6	–13.6
5000 m	14:55.79	12:37.35	118.3	–18.3
10,000 m	31:14.58	26:17.53	118.8	–18.8
110 m hurdles	14.57	12.87	113.2	–13.2
400 m hurdles	55.09	46.78	118.7	–17.8
3000 m hurdles	9:29.51	7:53.63	120.2	–20.2
High jump	1.95	2.45	79.6	–20.4
Long jump	7.48	8.95	83.6	–16.4
Triple jump	14.62	18.29	79.9	–20.1
Shot put	15.16	23.12	65.6	–34.4
Discus throw	40.69	74.08	54.9	–45.1
Javelin throw	56.84	98.48	57.7	–42.3
Hammer	47.44	86.74	54.7	–45.3
20 km walk	1:25:22	1:17:25.6	110.5	–10.5
Marathon	2:29:59	2:03:38	121	–21

Comparison of Inas and IAAF athletic records (men)

Dramatic differences between the performances of intellectually disabled and intact men are evident reaching in extremes 8.2–45.3%. If the situation is compared within individual athletic events, differentiated values are obtained.

In sprints, the difference reaches the value of 8.2–11.8%. These differences are practically the lowest identified in men's events.

In middle distance track events (800 m and 1500 m), some difference is apparent, in the 800 m race the difference is merely 8.7%, while in the 1500 m race it already reaches 13.6 %.

In track endurance events (5000 m and 10,000 m), the difference keeps growing up to over 18%. In this respect, the performance of ID athletes in 20 km walk may be considered exceptionally high-quality as the difference is unusually low accounting for mere 10.5%. The performance in the marathon race of ID male athletes is by 21% worse, i.e. there is practically the same difference as in long track events (5 km and 10 km).

In track hurdles, the difference in performance keeps growing with the track distance ranging from 13.2% up to 20.4%. In comparison to flat tracks, a ca 2% growth is evident here, which may be attributed to higher demands of track hurdles for coordination.

In jumping events, the difference is at the level of 16.4–20.4%. The growing difference may most likely be explained by higher demands for mastering the technique and combining speed and take off in long jump, or speed and repetitive take offs in triple jump, and transforming horizontal speed into vertical speed in high jump.

The greatest differences in performances may be identified in throwing events accounting for 34.4–45.3%. Here, the technical demands in throwing events and high demands for power may be the major reasons for such big differences.

The interpretation of differences in the performance of ID and intact men may very likely be a component part of the confirmation of the nature of intellectual disability. The popularity and (technical) simplicity or, on the other hand, complexity of a respective event may also play some role here. The differences in running events are relatively lower.

In disciplines with growing technical demands for an event or with growing demands for endurance skills, the difference in performances also slightly grows. The prominent differences in throwing events may be explained by their high technical demands and by high demands for power and speed-power performance where an intellectual handicap may play a more significant role.

Table 2. Comparison of athletic performances – world records (Inas) and Czech records (ČSMPS) of individuals with intellectual disability and intact athletes (IAAF) – women. IAAF, Inas and ČSMPS records were valid as of 31. 12. 2011

Event women	World record Inas	World record IAAF = 100%	% share	Difference in % Inas/IAAF	Czech ČSMPS record	Difference in % ČSMPS/ IAAF	Difference in % ČSMPS/ Inas
100 m	11.91	10.49	113.5	–13.5	13.37	–27.5	–12.3
200 m	25.01	21.34	117.2	–17.2	28.80	–35	–15.2
400 m	56.78	47.60	119.3	–19.3	71.70	–50.6	–26.2
800 m	2:07.74	1:53.28	112.8	–12.8	2:43.80	–44.6	–28.2
1500 m	4:24.85	3:50.46	114.9	–14.9	6:34.40	–71.1	–48.9
5000 m	17:18.38	14:11.15	122	–22	24:41.10	–74	–42.6
10,000 m	36:46.34	29:31.78	124.5	–24.5	–	–	–
100 m hurdles	15.15	12.21	126.9	–26.9	18.20	–49	–20.1

Event women	World record Inas	World record IAAF = 100%	% share	Difference in % Inas/IAAF	Czech ČSMPS record	Difference in % ČSMPS/ IAAF	Difference in % ČSMPS/ Inas
400 m hurdles	1:06.13	52.34	126.3	–26.3	–	–	–
High jump	1.68	2.09	80.4	–19.6	1.48	–29.2	–11.9
Long jump	5.72	7.52	76.1	–23.9	4.75	–36.8	–17
Triple jump	11.42	15.50	73.7	–26.3	10.16	–34.5	–11
Shot put	14.33	22.63	63.3	–36.7	8.82	–61	–38.5
Discus throw	42.26	76.80	55.0	–45	23.41	–69.5	–44.6
Javelin throw	39.77	72.28	55.0	–45	31.66	–56.2	–20.4
Hammer	46.46	79.42	58.5	–41.5	–	–	–
Marathon	2:39:12	2:15:25	117.6	–17.6	–	–	–

Comparison of Inas and IAAF records (women)

Again, there are visible differences between the performances of intellectually disabled and intact women accounting for 13.5–45%; in the majority of events the differences are by 2–5% higher than in men.

In sprints, the difference reaches values of around 13.5–19. 3%. It is a difference by 2 and more per cent greater than may be observed in men. Among potential reasons is the fact that these records for intact women are very "old" and were achieved by exceptionally talented female athletes.

In middle distance track events, the previous sentence may also illustrate the 800 m race. The differences of 12.8% (800 m) and 14.9% in the 1500 m race are comparable to the differences in men.

In endurance track events (5000 m and 10,000 m), the difference keeps growing up to 22–24.5%. In this respect, the performances of ID athletes in the marathon race are very good as the difference reaches only 17.6%.

In track hurdles, the difference in performances grows up to over 26%. Hurdle races evidently do not rank among events preferred in ID athletics. Furthermore, the technical demands play a distinct role to the disadvantage of ID.

In jumping events, the difference is at the level of 19.6–26.3%. The relatively smallest difference is in high jump (19.6%), which is a difference smaller than that identified in men (20.4%). If we compare the men's and women's falling behind in long jump, the improvement in the women's performance in this discipline might be expected.

The greatest differences may be identified in throwing disciplines accounting for 36.7–45.0%. The differences are similar to those in men. We adhere to the same explanation of these high differences as was said above for men.

The explanation of the differences between intact and ID women also most likely results from the nature of intellectual disability of female athletes. The popularity and (technical)

simplicity or complexity of a respective event may also play a significant role here. Unlike men, the differences between women's running events are relatively smaller.

In disciplines with growing technical demands for an event or with growing demands for endurance skills, the difference in performances also slightly grows.

Like in men, prominent differences in throwing events may also be observed in women. These may again be explained by their high technical demands and by high demands for power and speed-power performance where the intellectual handicap level may play a more significant role.

Comparison of IAAF and ČSMPS performances (women)

The still more dramatic differences between intact and Czech ID female athletes are very evident. A difference below 30% may only be found in the 100 m running race (27.5%) and in high jump (29.2%). A difference below forty per cent may be seen in the 200 m running race (35%), long jump (36.8%) and triple jump (34.5%). In throwing events, the difference accounts for around 60%, and in 1500 m and 5000 m races the difference is over 70%. It seems evident that in this case we compare practically incomparable.

Comparison of Inas and ČSMPS records (women)

This comparison points out great differences between the national and world performances of ID athletes. With some generalisation we may say that the differences copy the differences between IAAF and Inas.

The lowest falling behind may be identified in the performances in triple jump and in high jump (11.0 or. 11.9% respectively).

This may be caused by the fact that it was in triple jump that our female athlete won a medal at the Inas world championship (WC).

The difference below 20% is in 100 m (12.3%) and 200 m (15.2%) sprints. In 400 m and 800 m races, the difference ranges around 26–28%. More dramatic differences were identified in 1500 m (48.9%) and 5000 m (42.6%) races.

Even though ČSMPS female athletes obtained numerous good results at Inas world championships in the past, the differences between the national and the world record levels are unsatisfactorily high.

The performances in throwing events fall behind by 38.5% (shot put) and 44.6% (discus throw). The exception is javelin throw where our record falls behind the Inas record by 20%. It was in this event as well that our female athlete won a medal at the Inas world championship.

CONCLUSIONS

The presented study is an attempt to compare by means of qualitative analysis the performance level of intact athletes (IAAF records), intellectually disabled athletes represented by records of the Inas federation and the records of the best Czech intellectually disabled female athletes organised in the Czech Sports Association for the Mentally Handicapped.

The comparison at the world level (IAAF and Inas) implies differences accounting for 8.2–45.3%. The differences between intact and intellectually disabled men are by cca 2–10% lower than in the same women's disciplines. It is only in three events that the differences between intact and ID female athletes are slightly lower than in male athletes (high jump, discus throw, javelin throw).

The smallest difference between the IAAF and Inas records is in sprints and middle distance track events in both men and women (10% men, or 15% women respectively). The differences in long distance track events account for 18% (men) and 23% (women).

In jumping disciplines, the differences vary a lot, with some generalisation they are 20% for men and 24% for women.

Throwing events for practically both sexes bring differences of over 40% (except for shot put).

Comparing the world level of intellectually disabled female athletes represented by Inas records and the national record level represented by ČSMPS female records the differences are 11–48%. The practice of the participation of Czech ID athletes at top world competitions organised by Inas has shown that differences of around 10–12% might result in our athletes' placement in the finals of these competitions, and a difference in performance of less than 10% might even result in a medal.

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SROVNÁNÍ ATLETICKÝCH REKORDŮ INTELEKTOVĚ POSTIŽENÝCH OSOB S REKORDY INTAKTNÍCH SPORTOVCŮ

PAVEL TILINGER

SOUHRN

Srovnávací studie mezi IP a intaktními byly realizovány v řadě oblastí (psychika, somatické charakteristiky, motorika jedinců s IP, srovnání úrovně intelektu a motorické výkonnosti).
Studie přináší srovnání rekordních výkonů intelektuálně postižených atletů s rekordy sportovců většinové populace. Pro komparaci jsme využili stávající světové rekordy vedené mezinárodní atletickou federací IAAF a Inas, (mezinárodní organizací pro paralelní sport pro osoby s intelektovým postižením). Pro srovnání českých nejlepších atletek se světem byly využity rekordy ČSMPS (Českého svazu mentálně postižených sportovců, žen). Ze srovnání světových rekordů (IAAF a Inas) vyplývají diference na úrovni 8,2–45,3 %. Diference mezi intaktními a intelektově postiženými muži jsou o cca 2–10 % nižší než u obdobných disciplín žen. Pouze u tří disciplín jsou rozdíly mezi intaktními a IP u žen nepatrně nižší nežli u mužů (skok vysoký, hod diskem, hod oštěpem). Nejmenší rozdíl mezi rekordy IAAF a Inas je u sprintů a středních tratí mužů i žen (10 % u mužů, resp. 15 % u žen) Rozdíly na dlouhých tratích dosahují 18 % (u mužů) a 23 % (u žen).
Ve skokanských disciplínách jsou diference velmi různé, při určitém zobecnění 20 % u mužů a 24 % u žen. Vrhačské disciplíny prakticky u obou pohlaví přináší rozdíly nad 40 % (vyjma vrhu koulí).

Klíčová slova: Inas, ČSMPS, IAAF, srovnání výkonnosti, intelektově postižení

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THE YMCA IN CENTRAL EUROPEAN COUNTRIES AS ONE OF THE WAYS OF AMERICANISING CENTRAL EUROPE AFTER THE FIRST WORLD WAR (BASE OF INFORMATION AND METHODOLOGICAL APPROACHES TO RESEARCHING THE ISSUE)

TOMÁŠ TLUSTÝ

SUMMARY

The YMCA is essentially an organisation uniting people of Christian faith. The basis of its work was the so-called "Four-way program", which included religious (spiritual), educational and physical education activities. This organisation was established in London in 1844, having been formed by sales clerk George Williams. The YMCA began to spread rapidly throughout Great Britain. From here it spread to France and subsequently to Holland and Germany. It particularly flourished in the United States of America and came to Czechoslovakia from there after the First World War. Here, the YMCA began to establish military and later student residences. It played an important role in developing basketball, volleyball and other sports. It significantly contributed to the rise of permanent summer camps. It also brought a new view of the world, emerging from American Protestantism. The basic method we have decided to use is the comparative method. Using this classic method of historical research, it is necessary to compare the extent to which the YMCA organisation contributed to the "Americanisation" of national cultures of observed countries and how much it influenced young people. Due to the anticipated inequality and imbalance of sources, the method of probing will have to be used to assess individual regions. Unpublished archive materials as well as magazines and news reports from the period, which have not been systematically researched as yet, will be used as sources of information.

Key words: activity, trade unions, sports grounds, results, sportsmen, functionaries

INTRODUCTION

The YMCA, the Young Men's Christian Association is essentially an organisation uniting people of Christian faith. However, its program was not merely restricted to faith but had a wider dimension. The basis of the work of the YMCA organisation was its so-called "Four-way program", which included religious (spiritual), educational and physical education activities.[1]

[1] RIESS, L. W. (1923). Úkoly tělovýchovného odboru Ymky. *YMCA (Časopis sdružení YMCA v Československu)*, 2(3), pp. 65–68.

This organisation was established in London in the mid-19th century, having been formed by sales clerk George Williams. To start with, the YMCA had a mere 12 members and had been established as an amateur missionary organisation, a lay apostolate for young people. George Williams wanted to offer young people the possibility of spending free time whilst focusing on Christian principles. At first, the YMCA organisation was only made up of a group of enthusiasts, but this association began to spread very rapidly around London, England and very soon into other countries around the world. In 1852 Williams spent time on business in Paris. Here he initiated a meeting of local pastors, who, thanks to his subsequent financial aid, established the YMCA in Paris, spreading further from here into Holland and Germany. It particularly flourished in the United States of America, where a number of new sports emerged.[2]

Through the YMCA, these sports began to penetrate into our country after the First World War. Indeed, during the First World War, there were relatively large numbers of foreign YMCA workers on the battlefields and in the Allies' POW camps. Not only did they set up reading rooms, tearooms and kitchens for soldiers but they also offered them leisure activities, which the soldiers enthusiastically joined in with.[3] It was in this way that the association became acquainted with Czechoslovak legionnaires, who they accompanied to Czechoslovakia after the war on the basis of an agreement between the US Ministry of Defence and the Czechoslovak Republic and began to cultivate basically unknown kinds of sports.[4]

Its international character was of great significance for our physical education and sport. The YMCA sent its workers abroad to be trained in various sports and, on returning, these people could pass on their experience gained in many countries of the world, where various kinds of sports had higher standards than in our country.[5] In addition, it was not long before gyms and sports grounds began to be constructed here. Unlike a number of other organisations, it did not lack money, which it received from its American colleagues. Further money was gained from the state. Credit goes to the YMCA for investing a large sum of money from the subsidies that were granted to it by the Czechoslovak Republic in the form of extensive building warranties in buildings designated for physical education and sport. Inhabitants of Prague got their first sight of an indoor swimming pool in the YMCA palace, or of a banked running track and gymnastics hall. All of this was in one complex, comprising saunas and baths too. No centre or hotel in Czechoslovakia could offer anything like that. Dozens of playgrounds and sports grounds were built throughout our country from subsidies which individual YMCA organisations in the USA contributed to in solidarity. In addition, several civic centres were built for educational purposes as well as swimming pools, student restaurants and hostels.[6]

Sports like volleyball or basketball are extremely widespread in the Central Europe of today. However, few people know anything about their origins, their arrival in Central

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2 KONEČNÝ, J. (1930). *YMCA její vznik, dějiny a význam*. Praha, pp. 28–30.

3 HLAVÁČ, P. (2010). YMCA v Československé armádě na začátku 20. stol. In: *YMCA v proměnách času*. Praha: YMCA v ČR, pp. 5–8.

4 BUREŠ, P. & PLICHTA, J. (1931). *Sport a tělesná kultura v Čsl. republice a cizině*. Praha: Almanach sportu, p. 383.

5 National Archives in Prague, fund YMCA, pasteboard 4, sign. 8.

6 CHLÁPEK, P. (2004). *YMCA a její význam pro českou společnost*. Diplomová práce. Praha: Univerzita Karlova v Praze, pp. 91–94.

European countries, about their initial popularity and propagation through the organisation that initially brought them here and equally about physical education and sport in the YMCA in general. However, in Central European countries the physical education and sporting activity of this organisation could have developed quite differently. One clear benefit for Central European historiography would be to attempt to compare the development in individual Central European countries. The submitted paper attempts to describe a way of researching this issue. It also provides a summary of sources of information, which will have to be studied in order to deal with the issue in full. It also presents a summary of what has already been carried out while dealing with the issue.

Central Europe

A special zone or region is often included in the division of Europe: Central Europe. This term was presumably used for the first time by the Vienna Peace Congress in 1815. It marked the area of today's Germany and Benelux (Europe intermédiaire). This special standing was first reflected in the German environment, where Germany was characterised by its central position.

In history, the Central European region has been interpreted in various ways and given various names. For example, the Central European trio (Czechoslovakia, Poland and Hungary) were joined with the Balkans to become Eastern Europe.[7]

The Central European region was further defined not only by industrial differences, which separate it from both Western and Eastern industrial zones, but Central Europe was also specific in terms of agriculture.

In history, there have also been several attempts to define Central Europe as a specific cultural area. One of the oldest cultural concepts defines Central Europe as the region of the "second wave" of universities, founded in the 14th and 15th centuries.

Central Europe also gets identified with the former Habsburg Monarchy, but many authors limit it to the triangle of Poland, Bohemia/Czechoslovakia and Hungary, others to the six nations: Austrians, Czechs, Slovaks, Slovenians, Hungarians and Poles. However, these nations had relatively strong, close and long-lasting bonds with Germans living as a minority in the Czech lands, Poland and Hungary. Some German states or lands (Saxony, Brandenburg – Prussia, Silesia, the German Democratic Republic) shared a lengthy common existence with Central European nations. German influence has been very strong and is still apparent today.[8]

In 1950 Central Europe was defined as a crossing zone between the West and the East and it was even proposed to internally distinguish Western and Eastern Central Europe. However, during the Cold War these terms fell into oblivion, only to reappear in the eighties.[9]

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[7] BENEŠ, Z. (2010). Jinakost našich společných (nejen?) středoevropských dějin. *Historie – Otázky – Problémy: Jinakost našich společných dějin*, 3(2), pp. 11–19.

[8] WANDYCZ, P. S. (1998). *Střední Evropa v dějinách: od středověku do současnosti: cena svobody* 1. Praha: Academia.

[9] KŘEN, J. (2005). *Dvě století střední Evropy.* Praha: Argo, pp. 22–27.

American influence in Europe

From the very beginning of its existence, the United States of America has always appealed to Europeans. Over time, American democracy, its ideals, wealth and the vastness of the United States have become the subject of fascination and aspiration for millions of people around the world. In the second half of the 19th century, crowds of emigrants from Western, Northern and later from Central, Eastern and Southern Europe began to arrive in the United States of America. Millions of them were to make their dreams come true. They had reached the country offering the chance of a lifetime. For millions of other people around the world, the United States of America remain the land of plenty, land of countless possibilities and potential success or making a career "from shoe shiner to millionaire". This image has been strengthened to a large extent by its inhabitants themselves, the recent emigrants and current citizens of the United States of America.

With American participation in the First World War and Woodrow Wilson's politics, Americans and America began to influence the European continent at an unprecedented rate. After the United States of America's entry into the war, "The Gospel of Americanism" and the widespread activity of the Committee on Public Information, led by George Creel to inform and educate, left permanent traces here. The Committee played an important role in popularising America and its priorities in Europe and the world. It effectively promoted and "sold" the United States of America as an example of democracy and freedom as well as its superb system ensuring prosperity and its technological and civilizational progress.

Two million soldiers in the American expeditionary force opened up America to Europeans with their tinned food, uniforms, good equipment, modern technology, etc. For Europeans, America became particularly associated with mechanisation, automation, modernisation, unlimited possibilities, abundance and affluence. However, it was not only various products but also ideals and examples of American democracy that began to penetrate into Europe. This was the beginning of Americanisation of the "Old Continent" in big style.

It was in the twenties that the film boom also took off (first silent then spoken film) for American films began to enter Europe as well. Previously there had been foreign films from Germany, Italy and Denmark. The first American screen stories were brought to Czechoslovakia by theatre and film director Miloš Havel.[10] Not only films began to spread here but also jazz.

After the end of the First World War and the Paris Peace Conference, it seemed and was expected that the United States of America would remain active in Europe. Many American politicians also spoke of the need for American participation in the economic and political reconstruction of the "Old Continent". That was understood as a special mission to be executed. With Americans having everything a Europe destroyed by war and hopelessness needed at their disposal, expectations were even higher. That particularly applied to Central Eastern Europe and above all to states which had been newly established after the First World War, i.e. Czechoslovakia and Poland, among others.

[10] He brought mute filmed serial stories from the wartime. These were about cowboys or Indians, some of them were thrillers and so on. WAIC, M. & KÖSSL, J. (1992). *Český tramping 1918–1945*. Praha: Práh, p. 16.

Some politicians also played a significant and inseparable role in America's influence, particularly Wilson and Hoover, who typified for many Europeans the best sides of America, i.e. freedom, democracy, humanitarian aid, idealism, altruism, etc. As in Poland, President Wilson was a legendary figure in Czechoslovakia and enjoyed extraordinary popularity. For millions of Czechs and Slovaks, he symbolized American aid in gaining independence and the United States of America's responsibility for the fate of small nations, oppressed for centuries. This "defender of democracy" was a widely renowned personality.[11]

A significant role in the "Americanisation" of Central Europe was played by the YMCA. During the First World War there were relatively large numbers of foreign YMCA workers on the battlefields and in the Allies' POW camps. Not only did they set up reading rooms, tearooms and kitchens for soldiers but they also offered them leisure activities, which the soldiers enthusiastically joined in with.[12] It was in this way that the association became acquainted with Czechoslovak legionnaires, who they accompanied to Czechoslovakia after the war on the basis of an agreement between the US Ministry of Defence and the Czechoslovak Republic. The YMCA also came to Poland in 1919, with Polish military troops from the west, however. In both countries it began to carry out its humanitarian and social mission. It began to set up social centres, canteens, reading and common rooms for soldiers, it took care of prisoners of war and promoted physical education and sport.

Subject of research

After the end of the First World War, Central Europe was reorganised in Versailles, France. Apart from reparations being required from the defeated states and the disintegration of the Austro-Hungarian Empire, defeated Germany also lost part of its territory, part of which went to the newly-established states of Poland and Czechoslovakia, the latter gaining only a negligible part.[13] This led to the overall reorganisation of Central Europe and its division into the victorious states – Czechoslovakia, Poland and the defeated states – Germany and Hungary, which was the successor state of the former Hungarian Empire.

The YMCA had been established in both of the defeated countries in the 1880's. The YMCA had also worked in the territory of the newly-formed Czechoslovakia in the second half of the 19th century, but only through the so-called "Christian Youth Unions", whose activity was significantly hindered by the First World War.[14] It wasn't until after the First World War that it actually became widespread, just as in the territory of the newly-formed Poland.

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[11] PARAFIANOWICZ, H. (2003). Americký mýtus a amerikanizace Československa po první světové válce. *Lidé města,* 5(9). Available at: http://lidemesta.cz/index.php?id=661 [2012-12-31].

[12] HLAVÁČ, P. (2010). YMCA v Československé armádě na začátku 20. stol. In: *YMCA v proměnách času*. Praha: YMCA v ČR, pp. 5–8.

[13] But it was just a really small area – Hlučínsko. Hlučínsko was connected to Czechoslovakia at 4. 2. 1920. Villages Píšť and Hať stood the part of the Germany. They were connected to Czechoslovakia in 1923. Hlučínsko was the area of 316 km^2 where lived about 46,000 people. KŘEN, J. (2005). *Dvě století střední Evropy*. Praha: Argo, p. 378.

[14] These were religious associations which were founded thanks to G. Williams. He visited Prague in 1884. That was the short time after the conference in Berlin. Historie – YMCA [online] [2013-01-23]. Available at: http://www.ymca.cz/info-o-ymca/historie/.

In Central Europe, the physical education and sports activities of the YMCA have not yet been systematically researched. In order to synthesise this, it is necessary to use yet unpublished archive materials, primary and secondary sources which haven't yet been systematically researched. Gathering and successively recording them would become a significant contribution to the historiography of inter-war Central Europe.

However, to start with, what will have to be outlined is the arrival and origin of the YMCA in these particular countries as well as their political and religious situation. Furthermore, this problem requires an analysis of the activity of the YMCA in the inter-war period, which was the time when this organisation perhaps flourished most. This period was also extremely important for the fact that it was not until the end of the First World War that the YMCA began to spread among the masses in Czechoslovakia and Poland and, in addition, began to develop in the field of physical education and sport. The YMCA in Czechoslovakia was first dissolved in 1943, but it had already significantly restricted its activity with the approach of the Second World War. To introduce the issue, however, several important circumstances from the history of this organisation and the reasons for establishing it will also have to be outlined.

Along with the above-mentioned countries, it would be worth briefly mentioning other countries. It will definitely be necessary to describe the beginning of the YMCA in England, where this organisation was born and spread from. The rise of the YMCA in the United States of America can also be outlined, as it was here that this union grew significantly and significantly supported, in material and funding, the YMCA organisations which emerged in other countries around the world.

Methodological approach

The methodological approach will be based on researching documents in archives, period press and literature.

The basic method which will have to be used is the comparative method. With the help of this classic method of historical research, it will first be necessary to compare the acceptance of the YMCA as a Christian organisation in Catholic Poland and Hungary, Catholic – Protestant Germany and religiously-lacking Czechoslovakia. Another subject of comparison has to be how this originally English organisation, strongly supported by the United States of America, was accepted by the Central European states on the winning side on the one hand and the defeated on the other.

For the given comparison, it is also worthwhile observing the YMCA's share on the "Americanization" of the national cultures of the researched countries, to what extent young people were influenced and, not least, the credit the Christian organisation in question deserves for developing sport in Central European countries.

No less important will be to focus on the success, popularity and size of the member base of individual sports cultivated in the YMCA. Furthermore, it will be necessary to compare numbers and types of sports grounds built by the YMCA in Central European countries in relation to their economic policy.

The main question to pose is whether physical education and sport was developed by this organisation in the same way in the Central European countries or whether the YMCA, for example, developed in a completely different way in each Central European country.

This problem also requires defining and describing which of the observed factors differed and which corresponded. No less important will be to carry out an analysis of matches and differences between the objects of comparison.

Due to the fact that this is a comparison of territories which vary in size, such as Germany and Hungary, it will be necessary to take into consideration differences in the populations of these macro-regions. Some objects which are to be compared with each other will have to have their quantitative side investigated (e.g. the number of inhabitants per sports ground, etc.).

No less important will be to apply the comparative method in relation to a time axis. This is where two elements have to be confronted – what happened in a certain place sooner and what happened later (e.g. when the YMCA first started to build sports grounds in Central European countries). Some historical processes took place in different places at the same time (e.g. sport in summer camps). Furthermore, some of these researched objects are sure to have gone through a similar historical development, each of which having proceeded at a different pace, however. All of these processes should be taken into consideration.

Due to the anticipated inequality and imbalance of sources, the method of probing will have to be used to assess individual regions. A representative local organisation will have to be chosen in each state. However, certain choice criteria have to be considered in its selection (population of the town it operated in, etc.). After selecting representative organisations, it will be necessary to compare the observed criteria, which should lead to gaining a basic overview of the development of the YMCA in particular Central European states.

Furthermore, this problem requires a description of the development of physical education and sport in the YMCA in various Central European states in the inter-war period, including the arrival of the YMCA in these states, an outline of the political situation and a description of the events in given places dependent on time. Facing the task of observing the development of a relatively large territory, it will be necessary to take into consideration the fact that our researched events were taking place in this territory simultaneously at several levels. Therefore, events which were taking place in many places at the same time will have to be researched. This calls for using a synchronised approach to historical development. However, it is appropriate to combine this approach with a diachronic approach, which enables the description of the development of events which took place in one place dependent on time. The synthesis of the history of a larger unit should be based on a combination of both of these approaches. These two approaches to historical background principally correspond with the progressive method, because it comes to observing and recording of past events as they progressed chronologically.

The use of further methods which could be used while working on this issue is dependent on what materials and information are gained for this topic.

Sources of information

Facing a task that is of a research (theoretical) and documentary nature, it will be necessary to devote much attention to working through archive collections, regional periodicals, printed sources and literature. A big problem to be anticipated in this case will evidently be the inequality and imbalance of the occurrence of individual topic areas in archive collections, periodicals, sources, literature and on the internet, both from the point of view of

time and subject matter. However, it would be worthwhile trying to confront more sources from the period and subject them to a thorough internal review (an external one is unlikely to be relevant).

The YMCA was established in 1844 and still exists today. However, this association was not aimed solely at physical education and sport. This constituted only one part of the activities of the organisation as a whole. Consequently, it can be assumed that most information will concern another topic area. Researching Czech and Slovakian literature concerning this issue should not present too many obstacles. However, difficulties will set in during the heuristic research of foreign archive collections and the study of foreign press and literature from the period. This part will be both time-consuming and costly. Some of the foreign sources and literature have already been looked up. This literature is cited in the chapter Selected Bibliography. Its specific content and significance in dealing with this issue is not fully known.

It could be assumed that there are relatively large numbers of materials to be gained on this topic in the National Archive in Prague, but quite the opposite is true. The YMCA collection in the National Archive in Prague contains information of a very diverse nature, but little of it concerns physical education and sport. Although the whole collection is sorted into areas of subject matter, it is rather difficult to find one's way around it. In addition, very little information concerns the period of the First Republic. On the contrary, most materials deal with the fifties, which this topic is not actually focused on. One of the main reasons is the fact that a large proportion of materials from this period were destroyed by the Gestapo. Therefore, the archive can supply only a few reports on the activity of the YMCA in certain towns in a given year, several requests to obtain subsidies for physical education, several reports from summer camps (these were filed in a separate unit) and reports on sending YMCA workers to foreign vocational schools. After exploiting this information, the problem needs to be focused on another available archive in the Czech Republic, which is the YMCA Archive in the Czech Republic.[15]

The YMCA Archive in the Czech Republic likewise contains information of a diverse nature. A large number of annuals, reports or almanacs from YMCA summer camps are to be found in the archive. Correspondence between individual members of this organisation and state offices is also not negligible. However, finding one's way around this archive is relatively complicated. The archive is not sorted in a very systematic way. Despite this, however, it contains a large amount of information important for this issue.[16]

There are YMCA archives in other Central European countries too. However, their content and significance for a potential study is so far unknown. As well as gaining information from these archives, it will be necessary to visit other archives and libraries in the countries where this part of the history of the YMCA is to be researched. To mention some of them: Archiwum Akt Nowych w Warszawie, Archiwum Uniwersytetu Jagiellońskiego, Biblioteka Jagiellońska, Zentralbibliothek der Sportwissenschaften der Deutschen Sporthochschule Köln, Magyar Országos Levéltár or Országos Széchényi Könyvtár.

Period press is likely to be one of the biggest sources of information. However, its fragmentation around archives and libraries will be a big drawback. Information about sports

[15] National Archives in Prague, fund YMCA.
[16] Archives YMCA in Czech Republic.

matches and their results can be easily found in sports periodicals which were issued in the inter-war period. The weekly *STAR*[17] and *Sport*[18] contain a relatively large number of match reports and the organisation of individual matches, championships and competitions. Articles on the history of individual sports and their introduction in this country can also be found in them. They also contain a wide range of photographs. There are, of course, similar types of period press in other Central European countries and they will have to be studied in depth in order to successfully research this problem. A similar weekly can be found in Poland under the name of *Przegląd Sportowy*.[19]

Táborový zpravodaj YMCA, a magazine issued regularly by the YMCA, is of great significance for discovering facts. As its name suggests, its content mostly concerns the camp environment. Summer camps were very popular among YMCA members. It could even be claimed that the YMCA was the impulse behind the organisation of permanent summer camps in Czechoslovakia. This magazine contains a large number of articles and photographs from the camp life of YMCA members. The camps, of course, also ran sports activities. The magazine also contains a range of instruction manuals on how to make sports equipment (e.g. longbows, canoes, etc.).[20]

Other important materials include, above all, almanacs from YMCA summer camps, which contain a wide range of information and photographs from seasonal summer sports activities. Besides these, there were, for example, *YMCA* magazines containing (along with photographs) information on the history of the YMCA in various places in the Czech Republic, reports from summer camps, reports on the work of the physical education department of the YMCA and reports on the activity of the YMCA in certain years during the First Republic.[21]

Summer camp activity was also described by J. First in his book *Cesty a cíle našich táborníků: Účel a cíle letních táborů YMCA*. The book described camp regularities, everything a camp resident has to know and be able to demonstrate, what kind of tests of physical fitness there are in camps, what games were popular in summer camps and what achievements are necessary for various commendations.[22]

In the interwar period, the so-called *Nová tělesná výchova* was also issued. This was a journal devoted to physical education and sport. It contained, for example, information about the YMCA's physical education colleges in the United States of America or the results and courses of matches played in a particular year. This journal always contained a large number of photographs.[23]

The history concerning the establishment of the YMCA is relatively short but very accurately described in the book by J. Konečný called *YMCA její vznik, dějiny a význam.* This is one of the main publications from which information could be drawn for the part dealing with stating the YMCA to the whole issue.[24]

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[17] STAR, vol. 1926–1938.
[18] Sport, vol. 1923–1929.
[19] Przegląd Sportowy, vol. 1 (1921) – 19 (1939).
[20] Táborový zpravodaj YMCA, vol. 2 (1926), 3 (1927), 4 (1928).
[21] YMCA (Časopis sdružení YMCA v Československu), vol. 1 (1922) – 5 (1926).
[22] FIRST, J. (1935). *Cesty a cíle našich táborníků*. Praha.
[23] Nová tělesná výchova, vol. 1 (1927/1928) – 11 (1938).
[24] KONEČNÝ, J. (1930). *YMCA její vznik, dějiny a význam*. Praha.

In 1926, Kroměříž YMCA published the journal *Službou k cíli (řetěz služby vykonané YMCOU v Kroměříži pro mládež a občanstvo města i okolí za rok 1925)*. It describes, for example, the history of the worldwide YMCA or all the activities it carried out in 1925. Even numbers of competitors and matches in particular fields of sport are stated.[25]

An interesting publication, where a large amount of information can also be found is the book by J. A. Pipal called *Co je to tělesná výchova?*, in which the author describes his opinions on physical exercise and its importance. In this book, J. A. Pipal outlines the system of physical education and sport in the United States of America and suggests the modernisation of physical education and sport in Czechoslovakia according to this model.[26]

Several dissertations concerning the YMCA have been published in the Czech Republic. Some worth mentioning are: *YMCA a její význam pro českou společnost* by Mr Petr Chlápek[27] and *YMCA jako středisko výchovy mládeže v Československu 1919–1951* by Helga Černá.[28] However, both of the dissertations only deal marginally with physical education and sport in the YMCA. Mr Chlápek captures this organisation in great detail and focuses on whether the educational work of the YMCA had any specific impact on the lives of individuals in Czechoslovakia, who influenced their immediate vicinity with their attitudes. This work also relatively extensively captures the development of the YMCA in Czechoslovakia, including the arrival of the American YMCA in the Czechoslovak Republic.

YMCA jako středisko výchovy mládeže v Československu 1919–1951 documents the activities and influence of this Christian social-educational organisation on young people in Czechoslovakia in the first half of the 20th century. Its content deals more with physical education and sport in this association. However, it is by far not as comprehensive.

Perhaps the only self-contained work in the Czech Republic concerning the history of physical education and sport in the YMCA is the dissertation by Tomáš Tlustý – *Tělesná výchova a sport v organizacích YMCA a YWCA v meziválečném Československu*. However, this is almost exclusively devoted to the development of individual sports which were propagated in Czechoslovakia by the YMCA.[29]

In order to find out information about the activity of the YMCA and its work in specific parts of Central Europe, we can also make use of works which do not only concern this association but include the physical education and sports activities of a number of other organisations. One of them includes the "habilitation" work by J. Štumbauer – *Dějiny spolkové tělesné výchovy a sportu v Č. Budějovicích od poloviny 19. století do roku 1938*.[30]

For an outline of the political situation in individual countries where information on the history of the YMCA has to be sought in order to research this issue, the book by Jan Křen

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[25] *Službou k cíli (řetěz služby vykonané YMCOU v Kroměříži pro mládež a občanstvo města i okolí za rok 1925)* (1926). Kroměříž: YMCA.

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called *Dvě století střední Evropy* can be used. This book offers a comparatively interpreted history of Central European nations (Czechs, Slovaks, Hungarians, Poles, Germans, Austrians and Jews) in the modern era from the turn of the 18th century to present.[31]

In Poland, the issue of the history of sport in the YMCA has been dealt with by Ewa Kałamacka[32] and Bernard Woltmann.[33] In Germany, Rolf Müller[34] focused on physical education and sport in the YMCA and András Koczogh[35] in Hungary. However, these are probably cases of partial studies or works which concern a different period. Despite this, however, it is necessary to look up these studies as well and try to gain some important information from them.[36]

CONCLUSION

Despite physical education and sport being only one of the activities of the YMCA, it had a very serious approach to this part of its program. In inter-war Czechoslovakia, it was responsible for the "Americanisation" and modernisation of Czechoslovak physical education and sport, through which it introduced new sports and training methods or contributed to the introduction of the tradition of permanent summer camps. There are currently works describing physical education and sport in the YMCA in inter-war Czechoslovakia. However, the question remains whether the YMCA did the same in other Central European countries or whether it developed in a very different way. This question remains yet unanswered since there are currently no extensive publications describing this issue in a systematic and comprehensive way. For such works to be created, it will, above all, be necessary to visit designated archives and study period and current sports literature from Central European countries. The subsequent complex researching of the history of physical education and sport in the YMCA in Central European countries would undoubtedly become a significant contribution to Central European historiography.

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YMCA VE STŘEDOEVROPSKÝCH ZEMÍCH JAKO JEDNA Z CEST AMERIKANIZACE STŘEDNÍ EVROPY PO 1. SVĚTOVÉ VÁLCE (INFORMAČNÍ BÁZE A METODOLOGICKÉ PŘÍSTUPY K ŘEŠENÍ PROBLÉMU)

TOMÁŠ TLUSTÝ

SOUHRN

YMCA je v první řadě organizace sdružující lidi křesťanského vyznání. Základem její práce byl takzvaný „Čtyřstranný program“, do kterého patřila činnost náboženská (duchovní), vzdělávací a tělovýchovná. Tato organizace vznikla v roce 1844 v Londýně, kde ji založil obchodní příručí George Williams. Organizace se začala rychle šířit po Velké Británii. Odtud se rozšířila do Francie, následně do Holandska a Německa. K jejímu velkému rozkvětu došlo především ve Spojených státech amerických, odkud se dostala po 1. světové válce do Československa. YMCA zde začala zřizovat vojenské a později studentské domovy. Zasloužila se o rozvoj basketbalu, volejbalu a dalších sportů. Výrazně zde přispěla ke vzniku trvalých letních táborů. Rovněž přinesla nový názor na svět vycházející z amerického protestantismu. Základní metoda, kterou budeme užívat, je metoda komparativní. Pomocí této klasické metody historického výzkumu je nutno porovnat podíl organizace YMCA na „amerikanizaci“ národních kultur sledovaných zemích a míru ovlivnění mládeže. Vzhledem k předpokládané nerovnoměrnosti a nevyváženosti pramenů bude nutno využít metodu sondy k posouzení jednotlivých regionů. Při zpracovávání informací bude využíváno nepublikovaných archivních materiálů, dobových časopisů a novinových zpráv, které dosud nebyly systematicky zpracovány.

Klíčová slova: činnost, odbory, sportoviště, výsledky, sportovci, funkcionáři

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