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Knowledge and Attitude of Hungarian Athletes towards Long-term Sports Injuries

Authors' contribution:
A) conception and design of the study
B) acquisition of data
C) analysis and interpretation of data
D) manuscript preparation
E) obtaining funding

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ABSTRACT

The purpose of this study was to investigate long-term sports injuries, their prevalence, general identification of and consultation about injuries, and the knowledge among Hungarian athletes related to injury prevention. A questionnaire was designed to survey athletes regarding these topics. Olympic medal winners, nationally selected athletes, and amateur athletes were surveyed, and altogether 502 completed questionnaires were obtained. The data was analyzed with the Chi-square test for dichotomous variables and the Kruskal-Wallis H-test for questions with the Likert scale to try the statistical power of the hypotheses. The results of our analysis show that athletes suffer injuries regardless of their level of play, and that athletes regard their sports to be moderately dangerous. Most athletes would compete despite the risk of permanent injury; they compete with injuries mostly of their own volition; and they will risk potential injuries or long-term health damage to gain exceptional outcomes. Success is the first and foremost desire of athletes, and the risk of injuries or even long-term health damage does not play an important role in the value system of Hungarian athletes. Sport managers and officers of sport federations must be made aware that the first line of prevention of sport injuries is comprehensive medical consultation with proper medical coverage.

KEYWORDS injury prevention, sports policy, Olympic medalists, sports federations

Introduction

Injuries happen to professional and amateur athletes alike, and can even occur in leisure sportsmen. According to Kosiewicz (2010), aggressive behaviors will become a significant component of sport expression in the future, with which sport injuries will increase as well. As every injury has a negative impact on the overall health of the body, it is important to inform athletes of the need to prevent injuries and properly rehabilitate injuries after they occur. To construct effective intervention to increase prevention, it is crucial to study the specific injuries of given sports, the knowledge of athletes about potential injuries, and the medical support available.

Van Mechelen, Hynek, and Kemper (1992) state that "in general sports injury is a collective name for all types of damage that can occur in relation to sporting activity" (p. 84).

Sports injury is any injury that results from participation in sport with one or more of the following consequences: (a) a reduction in the amount or level of sports activity; (b) a need for (medical) advice or

treatment; or (c) adverse social or economic effects (van Vulpen 1989, as cited in van Mechelen et al. 1992, p. 85).

Sports injuries are usually categorized by severity or incidence, but it is important to note that if only injuries that are seen by the insurance system or by a medical institution are considered, then most athletic injuries remain invisible.

Maffulli, Longo, Gougoulias, Loppini, and Denaro (2010) found that elite athletes often risk severe sports injuries to achieve better results. Elite athletes often force the body beyond its capabilities, which causes pain and can even cause injury (Pisk, 2017). According to Sávolt-Szabó (2015), the occurrence of sports injuries and accidents are increasing, as are permanent impairments to health, because of the increasingly higher expectations that increase pressure in competitive sports.

As reported by Kosiewicz (2014), spectacle sport is more dramatic when authentic pain, suffering, and blood are present because of injuries, and this dramatization is enhanced by the replays and close-ups that make it more visible and allow it to attract more and more spectators.

Tjonndal (2016) found that the common acceptance and encouragement of player violence and self-violence in ice hockey has led to many broken bodies, lives, and careers among professional male athletes.

Athletes' motivation for pushing themselves through injury or using performance-enhancing drugs is also present. Take for example Goldman's dilemma in 1982, where 198 world-class elite athletes were asked if they would take a drug that guaranteed sporting success but would result in their death in five years' time: 52% answered in the affirmative (Goldman, 1982). Connor and Mazanov (2009) tested Goldman's dilemma on a random sample of the Australian general public and found that only a minor portion (1%) of the general public answered in the affirmative.

Either from the players or from the regulator's perspective, it is crystal clear that athletes have to be protected. If a given sport does not prevent injuries with its self-organizing, self-governing mechanisms, then systematic injury prevention will have to be in the focus of policy makers and sport associations. Most of the negative effects of these injuries could be prevented by education, consultations, a professional approach, and general awareness. Long-term health damage could also be significantly decreased (Adirim & Cheng, 2003; Clarsen, Myklebust, & Bahr, 2013; Clarsen, Ronsen, Myklebust, Florenes, & Bahr, 2014; Engebretsen et al., 2013; Verhagen, van Stralen, & van Mechelen, 2010).

Objectives and research questions

The aim of this research is to conduct a survey among Hungarian athletes about the typical injuries that occur in their sport and to find injuries that could cause long-term, or even permanent, damage to their health. The following research questions were formulated:

- Is there a difference in the occurrence, knowledge, and support of athletes according to level of performance?
- What kind of special medical support is provided to elite athletes and what kind of education and information are given to them by medical doctors?
- How do athletes view the dangers of their sports?
- Would athletes risk injuries or compete with the symptoms of injuries?
- How often do athletes use medications, painkillers, or anti-inflammatory drugs (or have used them in their elite sports career)?

Hypotheses

To explore the above research questions, it was assumed that:

H1a: Athletes suffer long-term injuries regardless of the level of their performance.

H1b: Similarly, regardless of the level of their sports involvement, the examined athletes do not perceive their sport to be very dangerous.

H2a: Medical support given to Hungarian elite athletes is better than that given to amateurs.

H2b: Consultations about sport-specific injuries are more frequent for elite athletes.

H2c: The frequency of medical instructions to increase athletes' awareness about sport-specific injuries depends on the level of the athletes' sports involvement, but is not sufficient even for elite athletes.

H3: Elite athletes use pain relievers more often than amateur sportsmen.

H4a: Athletes compete when injured or ill, regardless of their level of performance.

H4b: Athletes compete with injuries because of external pressure.

H5: Athletes risk injuries and long-term health damage for the sake of exceptional results, regardless of the level of their sports involvement.

Material and methods

Research population

The population of the research consisted of three subsamples of Hungarian athletes. The athletes were classified according to their level of competition. The first group is composed of athletes who have won an Olympic medal either in individual or in team sports in the Summer Olympic Games (Group of Olympic Medal-Winning Athletes – OA). In Hungary, around 520-530 Olympic medalists are living. We selected 94 athletes from this group with quota sampling. This is 18% of the total population, which is a high rate considering the composition of the total population. The first subsample is representative of sports and gender, but not of age as it was very difficult to find and include elderly Olympians.

The second group is composed of active national athletes who have participated in international competitions, either individually or on a team. Most of them are Olympians who have not won a medal in the Olympic Games (Group of National Athletes – NA). The number of active national athletes is approximately 2,000, out of which 105 were selected with quota sampling. The second subsample is also representative of sports and gender.

As a control group, the third subsample is made of active amateur athletes, mostly from non-Olympic Sports. Information about them was obtained through their national sports association (Group of Amateur Sportsmen – AS).

Based on estimation, the number of the control group consists of between 400,000-500,000 sportsmen. A total of 303 of these individuals were selected with quota sampling for the sample, which is representative of sport and gender. However, due to the lack of exact data, the characteristics of the total population could only be roughly estimated and the representativeness of the third subsample should be considered with caution.

Data collection

To test the hypotheses, survey data was used. The data were collected by a questionnaire that consisted of 19 questions: 16 yes and no questions, two 5-point Likert Scale questions, and one three- way follow-up question. The questionnaires were administered in a different way in the individual subsamples. In subsample "a," a type of personal interview, a structured standardized interview was made with all of the Olympic athletes from the OA group. Their questionnaires were filled in by the interviewers.

Members of subsamples "b" and "c," participants in the NA and the AS group, filled in the questionnaire themselves. It was given to them by their national sports association and then sent back when completed. Between September 15, 2015 and November 30, 2016, 621 questionnaires were sent out to athletes from the different subsamples by the sports associations concerned. A total of 502 completed questionnaires were sent back, resulting in a high response rate of 80.8%.

The OA dataset consists of 94 responses (18.7% of the total), the NA dataset consists of 105 responses (20.9%), and the AS dataset, the control group, consists of 303 responses (60.4%). Thus, the research covers a high proportion of the total population of Hungarian Olympic medalists, which is unique to this research paper. The size of the other two subsamples, comprised of national athletes (NA) and amateur sportsmen (AS), is also extraordinary.

Ethical approval of the study was obtained from the Ministry of Human Capacities and informed consent (or assent for minors with parental/guardian consent) was obtained from all research participants.

Statistical Data Analysis

We analyzed the data with the Chi-square test for dichotomous variables and the Kruskal-Wallis H-test for questions with the Likert scale to test the statistical power of the hypotheses. Plots were generated using WinStat for Excel (R. Fitch software, Bad Krozingen, Germany). The level of significance was set at $p < 0.05$.

Results

As the main focus of this paper is the occurrence of long-term sports injuries, the sample was analyzed according to the injuries sustained. Injuries are serious events for athletes; therefore, knowledge about suffering injuries or overcoming them is very important.

Occurrence of injuries

There is a public belief that athletes at higher levels probably suffer more injuries. Therefore, the first hypothesis was to examine the occurrence of injuries suffered in the different groups. We did not find a significant difference among the different groups, as 69% of the Olympic medal winners, 81% of the national athletes, and 77% of the amateurs reported the absence of a severe injury (Chi-square test, $p = 0.12$; see Figure 1).

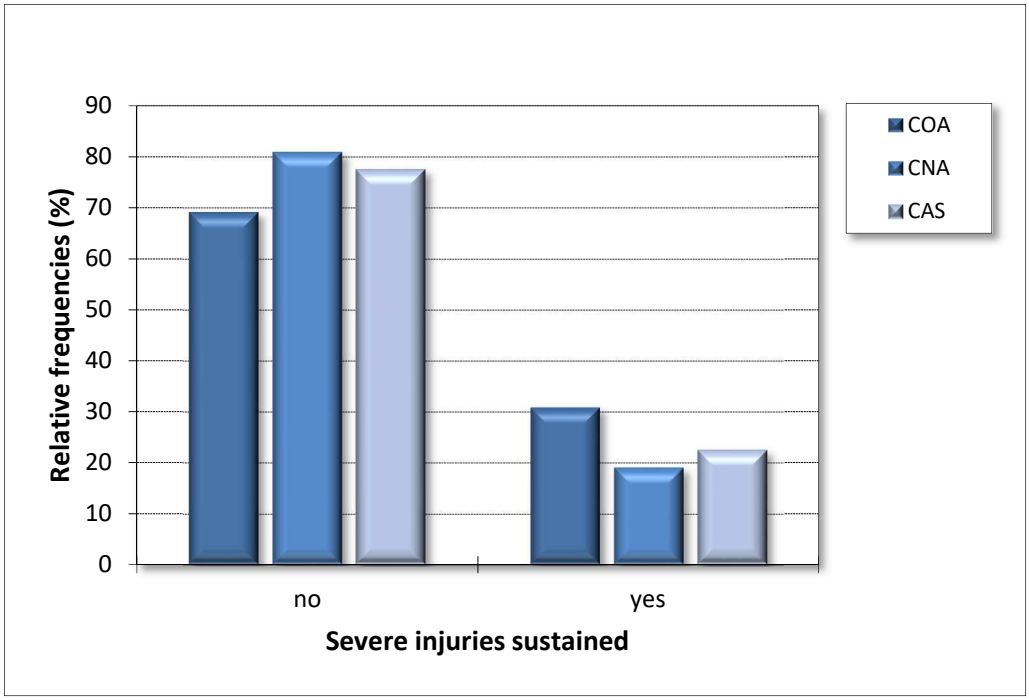

Figure 1. Severe injuries sustained by Hungarian athletes
Source: Authors' own study.

The athletes' opinion about how dangerous their sport is proved to be similar. The five-level Likert scale was used, where 1 meant *not dangerous* and 5 meant *very dangerous*. In this issue, we did not find a

significant difference between the athletes' views as the means were 3.02 ± 0.27 for OA, 2.48 ± 0.19 for NA, and 3.12 ± 0.13 for AS; $p = 1.469$ (see Figure 2).

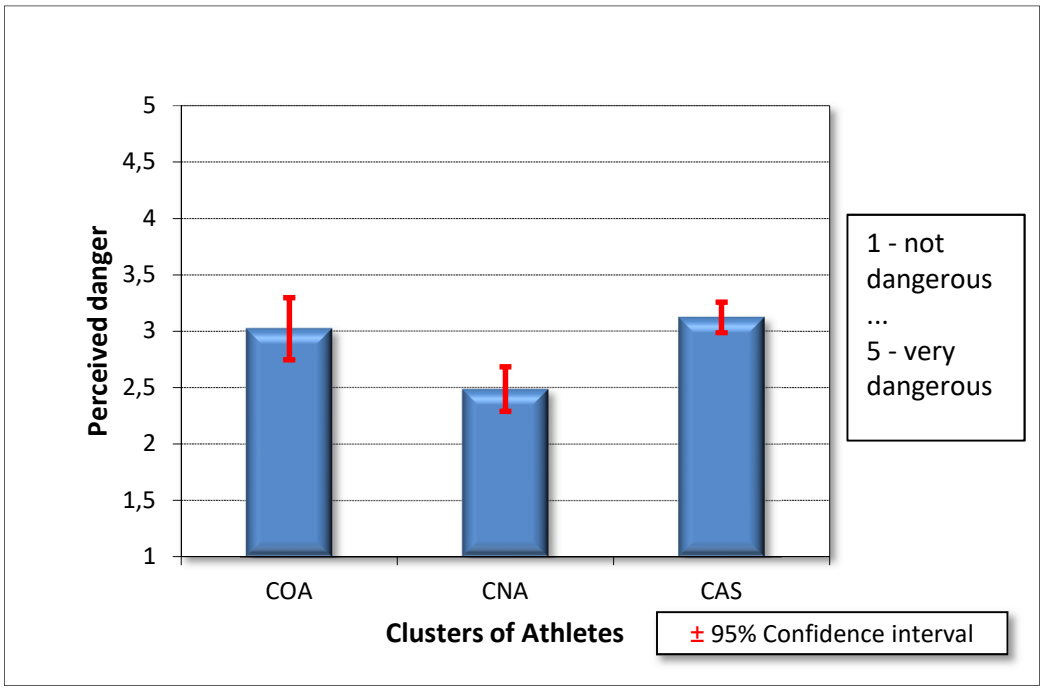

Figure 2. Perceived danger of the given sport
Source: Authors' own study.

Medical support

The findings reveal a significant difference among the groups regarding their medical support. A total of 84% of the Olympic medal winners and 77% of the national athletes reported that they had the medical support of dedicated medical doctors during their sports career, whereas only 12% of the amateurs reported having similar experiences (Chi-square test, $p < 0.00001$; see Figure 3).

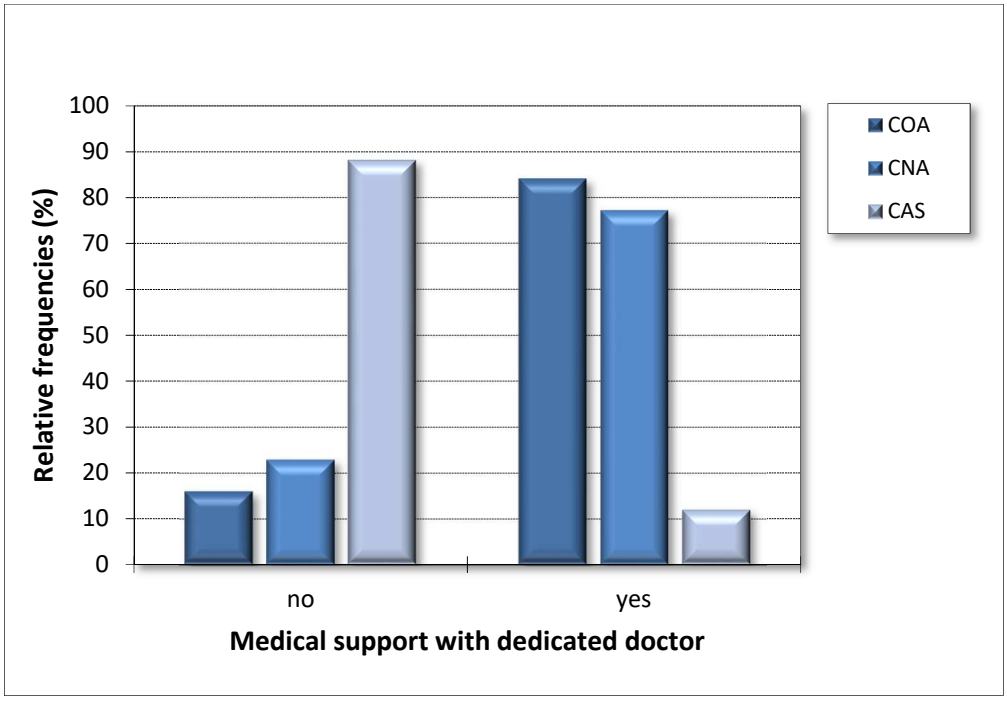

Figure 3. Medical support of Hungarian athletes
Source: Authors' study.

The research data show that the athletes had been instructed or educated about the medications they used and their effects during their sports career according to the level of their sports involvement. A significant difference was observed, as 69.1% of the Olympic medal winners and 68.6% of the national athletes reported that they had been instructed about the medications they used, whereas only 20.1% of the amateurs had been so instructed (Chi-square test, $p < .00001$; see Figure 4).

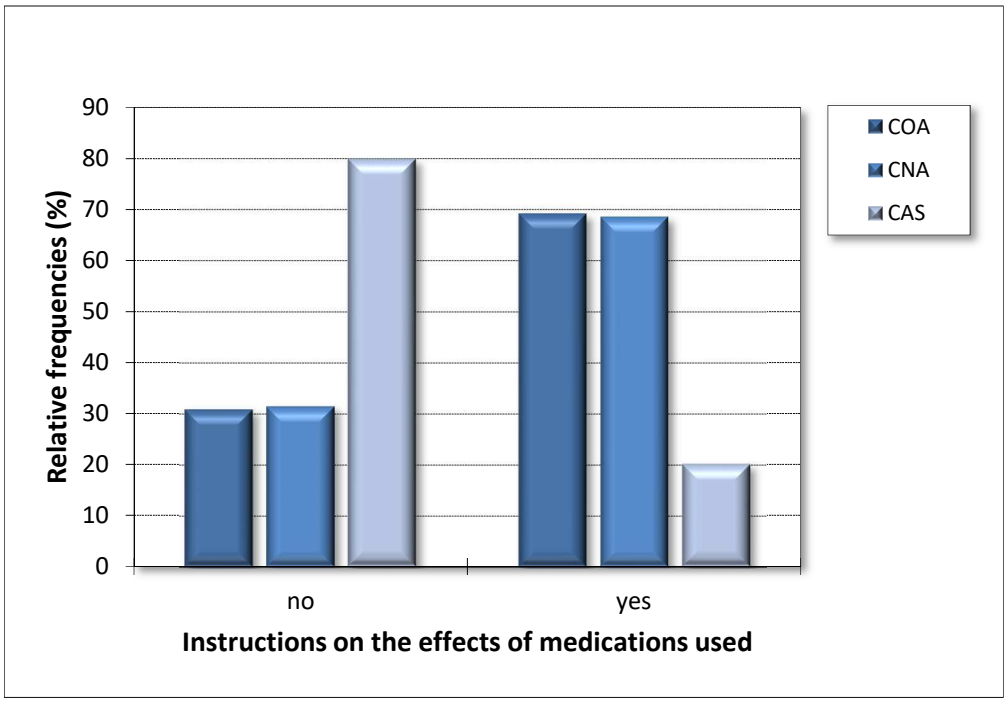

Figure 4. Instructions on the effects of medications used by Hungarian athletes
Source: Authors' own study.

Medical instructions about sport-specific injuries were reported by 45.7% of the Olympic medal winners, whereas only 23.8% of the national athletes and 18.5% of the amateur sportsmen reported having medical instructions about sport-specific injuries. In want of medical information, three-quarters of the examined athletes do not believe that sport-specific injuries can cause long-term damage to their health.

As shown in Figure 5, no significant differences were found among the groups of athletes with different levels of sport participation. A total of 29.8% of the Olympic medal winners, 26.7% of the national athletes, and 23.1% of the amateur sportsmen reported that they suffered long-term health damage during their sporting career (Chi-square test, $p = 0.39$; see Figure 5).

However, the fact that one-quarter of them experienced just the opposite should call attention not only to the responsibility of those in the medical field, but to all who can contribute to athletes' awareness of injuries and/or injury prevention (Figure 6).

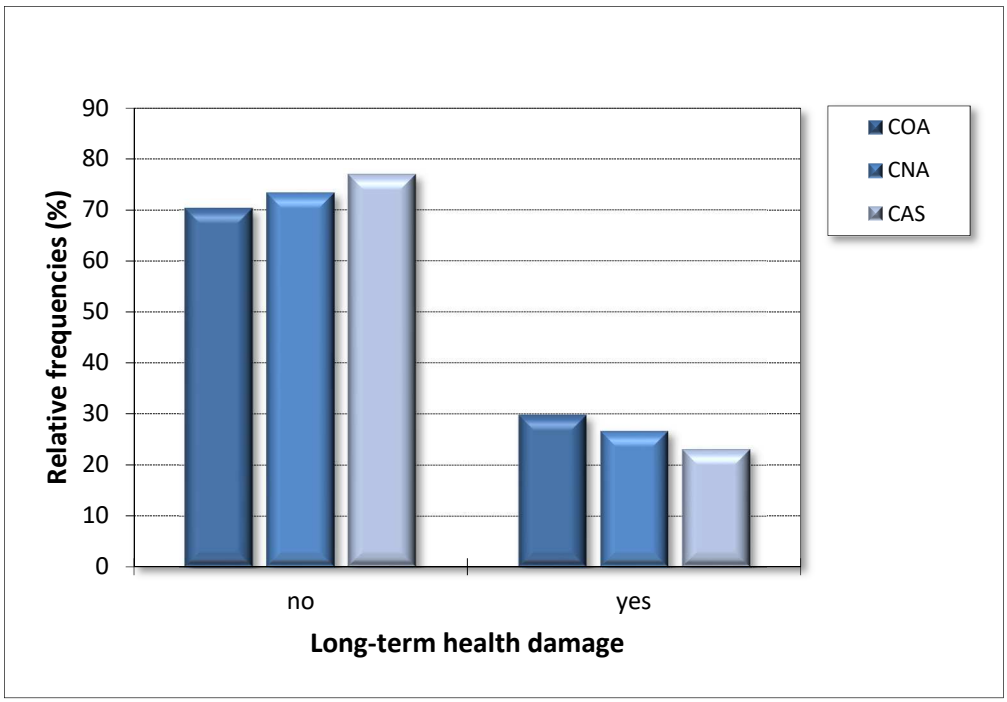

Figure 5. Long-term health damage of sport-specific injuries
Source: Authors' own study.

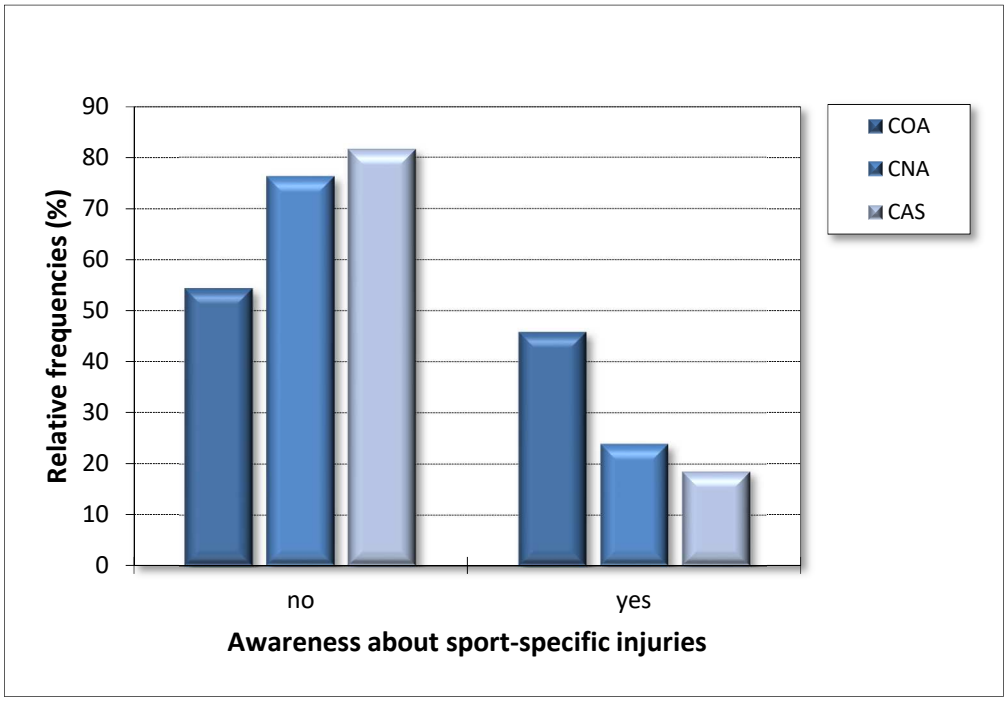

Figure 6. Awareness of Hungarian athletes about sport-specific injuries
Source: Authors' own study.

Using pain relievers

The examined athletes had to assign on a five-point Likert scale how frequently they used pain relievers during their sports career. No differences in pain-reliever usage were found between the different groups of athletes (Mean: 2.53 ± 0.24 OA, 2.46 ± 0.24 NA, and 2.5 ± 0.1 AS; $p = 0.948$; see Figure 7).

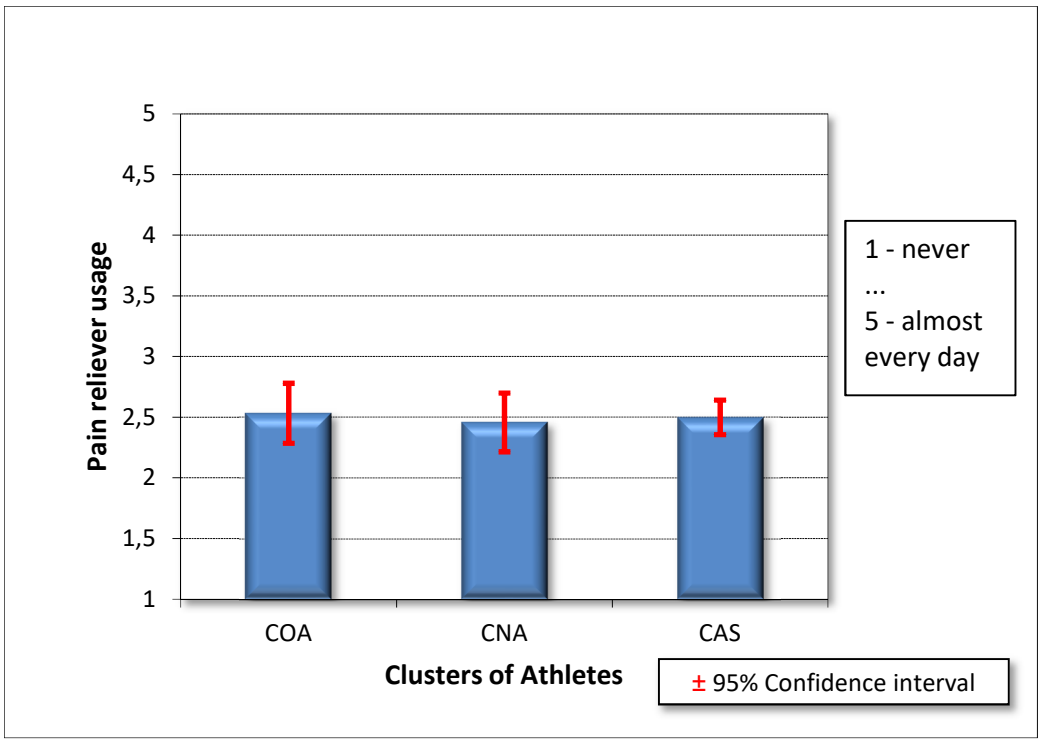

Figure 7. Frequency of taking pain relievers
Source: Authors' own study.

Competing while injured

Regarding the athletes' experiences about competing while they were injured or sick, no significant differences were found between the subsamples. The majority of the athletes competed in spite of injury or sickness (for example, with chills, a temperature, or a urinary tract infection) regardless of which group they belonged to (88.3% of the Olympic medal winners, 78.1% of the national athletes, and 73.6% of the amateurs). Therefore, no significant difference was found between the groups (Chi-square test, $p = 0.012$; see Figure 8).

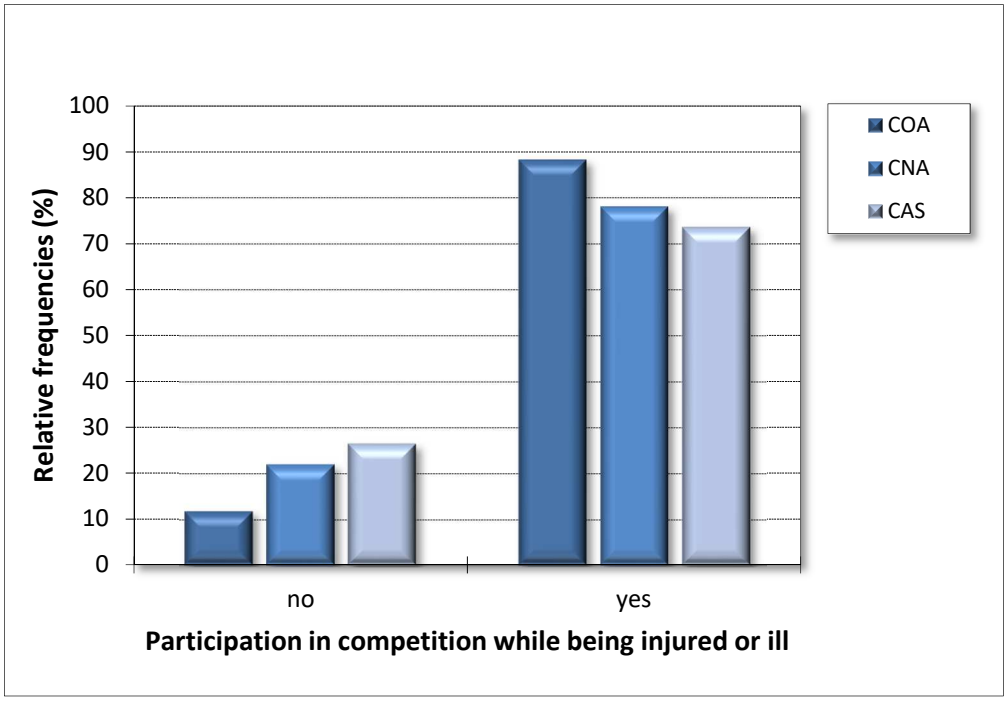

Figure 8. Participation of Hungarian athletes in competition while being injured or ill
Source: Authors' own study

Although most of the athletes competed while they were injured, a tendency could be noticed: lower-level athletes are less likely to compete when injured or ill.

The findings concerning the reasons behind competing while injured discovered that 78.7% of the Olympic medal winners, 47.6% of the nationally selected athletes, and 50.5% of the amateur sportsmen did it of their own volition. A total of 17% of the Olympic medal winners, 26.7% of the national athletes, and 17.5% of the amateur sportsmen have competed while injured or ill because of performance pressure in their sport. External pressure by their coach or parents played very little role in the athletes' decision in this regards (see Figure 9). However, it is very interesting that 21.9% of the national athletes and 26.4% of the amateur sportsmen involved in the research did not answer the question related to external pressure.

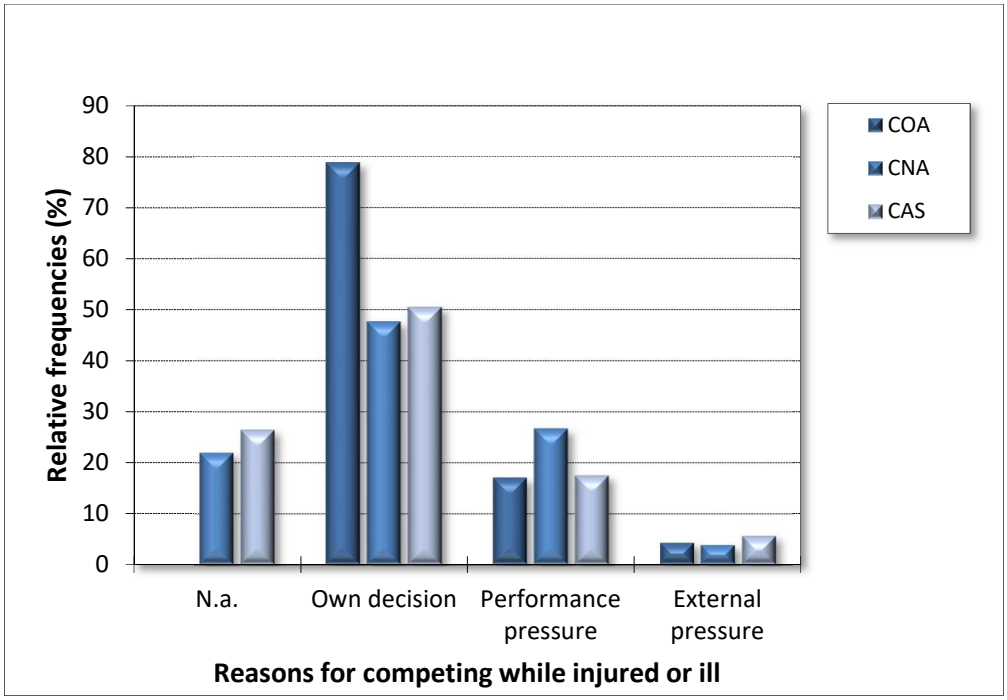

Figure 9. Reasons for competing while injured or ill
Source: Authors' own study.

Taking risks

Some of the findings referred to the athletes' willingness to risk damaging or even destroying their health in the hope of reaching outstanding achievement in their sport.

A significant difference was found between the different subsamples concerning jeopardizing their health in order to gain fame and a reputation in their sport. A total of 87.2% of the Olympic medal winners, 75.2% of the national athletes, and 64.7% of the amateurs stated that they would risk injury if they could become medal holders in the Olympic Games ($p = 0.00008$; see Figure 10).

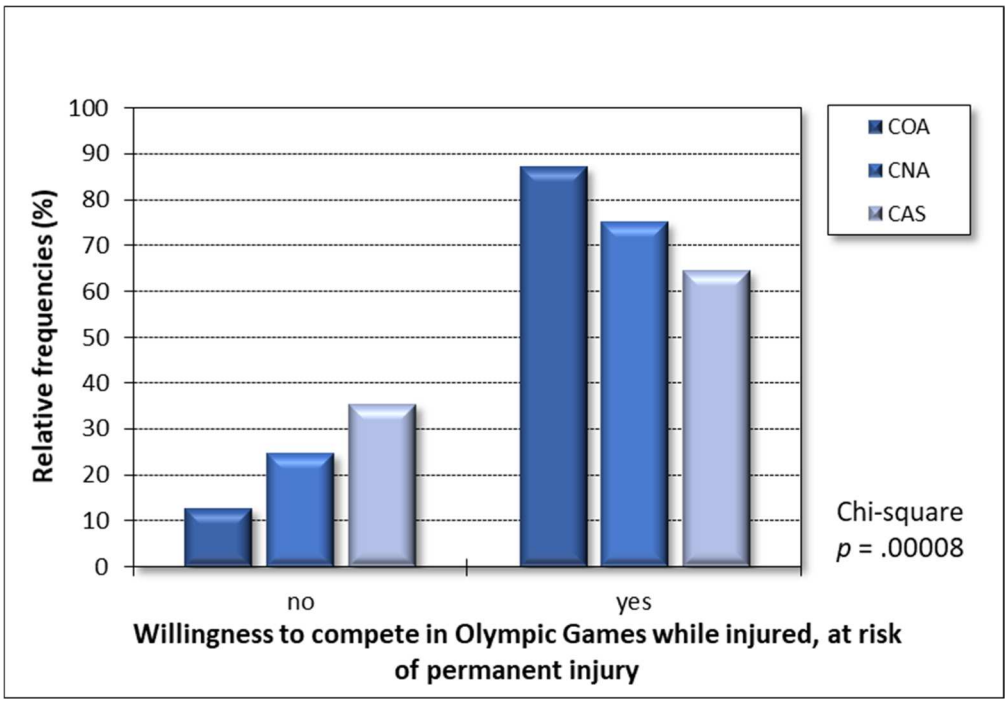

Figure 10. Willingness of Hungarian athletes to compete in the Olympic Games
Source: Authors' own study.

Although the differences between the individual subsamples are significant, even in the amateurs' group more than half of the athletes would compete with a lesser injury. They would be willing to cause trouble for themselves even though they know that competing with any kind of injury involves risk: their injury may get worse, and it may have permanent consequences. These results reveal an unhealthy feature of Hungarian sport: many athletes attribute too much importance to victory. Jeopardizing one's health is definitely against the true spirit of sport.

Discussion

Athletes often risk severe injuries for the sake of better results, but most of these injuries could be prevented through proper education and precautions (Alonso et al., 2009). The most important aim of this research was to assess the experience of Hungarian athletes with their injuries, injury prevention, their medical support, and their knowledge about injuries and possible consequences. On top of this, it was also investigated whether Hungarian athletes prefer to take risks for the sake of success.

The main assumption of the research was that Hungarian athletes – even Olympic medalists or nationally selected elite athletes – possess little information about sport-specific injuries, and they lack knowledge about potential long-term health damage as well. As was reported in the methodological chapter, 502 completed questionnaires were sent back to the researchers to analyze the differences and similarities of three different groups of athletes, namely, Olympic medal winners, nationally selected athletes, and amateurs. The high response rate to the survey questionnaire can be attributed to the athletes' exceptional interest in the controversial topic.

Regardless of the athletes' level of competition, they reported similar experiences in several issues. Examining the reasons of their account of these matters, we can state that most of the athletes have not received detailed medical information about the injuries prevalent in their sport and about the prevention of such injuries. Moreover, the athletes did not think that their sport would cause long-term health damage because they did not receive proper information related to this problem. This lack of awareness is also reflected in the fact that many of the athletes (not really differentiated by their level of performance) have competed while injured or ill. Most of them stated that they did so of their own volition, but informal conversations with several athletes revealed that we can rightly have some reservations in connection with this result.

The explanation of the significant difference between the different groups of athletes regarding medical support is controversial. On the one hand, it shows that Olympic medal holders and other nationally selected athletes are granted all medical supports by the Hungarian Government. On the other hand, these results also revealed that amateur athletes' lack of medical support is still an unsolved problem.

Most of the athletes stated that if they were medal contenders they would participate in the Olympic Games even if they risked an injury, and even if their medical doctor warned them that they might suffer severe or even permanent health damage if they re-injured themselves. There was, however, some difference in this regard between the groups, as 87% of the Olympic medal winners and "only" 64.7% of the amateurs answered that they would accept such a risk.

According to the results, the majority of the Olympic and other national athletes and even a high number of the amateurs long for success. The danger of injury or long-term health damage does not diminish performance pressures, mainly because athletes lack sufficient information about unwelcomed consequences and because their awareness of the need to be cautious has not been raised to an optimal level.

Conclusion and recommendations

Based on the findings, the hypotheses of our research were justified or refuted as follows:

- The first assumption (H1a) was verified, since the examined athletes reported long-term injuries regardless of the level of their sports involvement. H1b was also justified: the athletes in question did not consider their sport to be seriously dangerous.
- All three parts of the second hypothesis were accepted because significant differences were found between the groups of athletes with different levels of sport performance in connection with the medical support provided to them and with the frequency of consultation about sport-specific injuries and medical instructions to increase the athletes' awareness.
- The third assumption was refuted because, contrary to our hypothesis, the research data show that elite athletes do not use pain relievers more frequently than amateurs.
- The first part of hypothesis four (H4a) was accepted because the majority of athletes with different levels of sports involvement competed when they are injured.
- The second part of hypothesis four (H4b) had to be rejected because, according to the athletes' report, they did not compete with an injury because of external pressure.
- The assumption that athletes are willing to take risks in the hope of reaching outstanding sports achievements (H5) was not accepted because a significant difference was found between the three groups of athletes in this regard.

Athletes long for success and want to push their performance. Without proper medical information, however, these desires can lead to permanent health damage. Based on the results of our research paper, we must draw the attention of Hungarian sport managers and the leaders of the Hungarian sports associations to the need for the prevention of injuries and the avoidance of long-term damage. The primary method for this prevention could be full disclosure of such information to athletes along with adequate medical support, and this issue should be emphasized in *all* sports. We also suggest that the Hungarian Government amend the Act on Sports so that all sports associations and federations have a statutory obligation to introduce new regulations such as ethical regulations, child protection regulations, and sports health regulations, with an emphasis on protecting the interests of athletes.

The discussion about long-term sports injuries and especially about the prevention of these injuries is very scarce in the literature. Our paper made an attempt to contribute to this discussion by revealing elite and amateur athletes' experiences and knowledge about potential injuries. According to our study, athletes generally underestimate the dangers of their sports and do not have proper knowledge about the injuries they can sustain or the consequences of these injuries. Injured athletes would even risk long-term health damage if they could become medal winners in the Olympic Games. Injury prevention already exists in Hungary, and the next step should be educating athletes about injuries.

Our research had a complex, prevention-based approach. We are sure that if there were a wide-ranging dissemination of information about injuries, then the risk of long-term health damage would decrease. Besides prevention, risk mitigation of health-damaging sports injuries must also be considered. Risk mitigation would also reduce reparations; as such, litigation would be less frequent. Further research could examine rehabilitation after injuries, focusing on further policy recommendations to protect athletes from negative consequences, allowing them to concentrate fully on preparation for favorable results.

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