

Mind Does Matter: The Psychological Effect of Ankle Injury in Sport

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Abstract

Introduction: According to previous sports psychological studies the therapy of ankle sprain does not extend to psychological support of the injured athletes. The aim of this study is to emphasize the significant role of a complex approach and to help athletes in coping with the injury.

Methods: To estimate the psychological consequences of ankle sprain, between October and December of 2014 we asked athletes to complete our questionnaire, of 28 items. In February of 2015 the answers were evaluated by SPSS.

Results: 15,6% of athletes were satisfied with the acute care and 25% of athletes were satisfied with the rehabilitation. Satisfaction rates showed correlation with the motivation and with the attitude to rehabilitation and training. The rate of motivation affected the attitude to training and the opportunity of quitting sport. The latter was affected by the fear of reinjury as well. The most important consequence of sport injuries was missing a tournament (36,1%). The importance of social support was proved as well: 38,1% of athletes could share their problems and feelings with their family, 31,1% with the coach and the team and 23,8% with friends and their boy- or girlfriend. After the injury 61,1% of athletes could decrease anxiety with relaxation, exercise, psychotherapy or conversation. The most common reactions to the injury were fear, pain, shock, misadventure, frustration, disappointment and hope.

Conclusion: Results confirm our previous hypothesis, that for the earliest return to play injured athletes need psychological rehabilitation and they require psychological interventions as well as social support in the post-injury period. The team physicians and coaches should acquire communication skills, motivational methods and relaxation techniques to enhance support.

Keywords: Ankle injury; Sports psychology; Team physician; Biopsychosocial rehabilitation; Psychological intervention

Introduction

Doing sports, itself, constitutes the risk of injuries. The most common, and at the same time most frequent sport injuries relate to the ankle [1,2]. There were 3.1 million sports related ankle injury in the United States of America between 2002 and 2006 most of them in the 15-19 year age group. Beyond young age other influential risk factors were recognized; ankle ligament rupture was more common among men between 15 and 25 and in case of women beyond 30 years of age [3]. Women more often suffer ankle injury. Of children, teenage and adult athletes, children are most while adults are the least likely to suffer ankle injury [4]. Ligament rupture is faced by the majority of athletes who check into ER and only 10% of them have ankle fracture. Ligament ruptures mostly occur while playing basketball or football and regarding fractures hiking is considered the other dangerous sport beyond the two games mentioned above [5]. Sport injuries happen three times more often during matches than in training sessions and about half of them are related to the lower limbs. 50% of the cases contact between players is the cause of the injury and in this respect footballers and ice hockey players are the most affected [6]. The highest number of incidents for ligament rupture is typical with team sports and indoor sports, so rugby, football, basketball, handball and volleyball players are the most exposed to this kind of injury [7]. A Hong Kong study presented data that ligament rupture is twice more frequent with the dominant leg and 73% of the injuries are recurrent resulting in the chronic instability of the ankle joint [8]. The ankle injuries of athletes mean a significant burden for the health care system as well: according to studies in the Netherlands, the treatment of a single ankle ligament rupture cost 360 EUR in the country in 2001. Another study on soldiers from the United States of America showed that the treatment of musculoskeletal injuries cost 1 billion USD in 1994 [4].

Sport psychology is considered a relatively new field of science and many would question its relevance even today. Even 19% of athletes can meet the negative psychological impact of their suffered sport injury that increases the risk of a repeated injury in itself [9,10]. The stress triggered by the accident goes along with the athlete from the very moment of the injury through the process of rehabilitation to the moment of their return to competition [11]. The very frustration is not generated by the seriousness of the injury, but the insecurity whether how long the recovery would take and to what extent their daily routine would change due to the injury [12]. Stress and anxiety significantly hinders complete recovery, thus a proper rehabilitation process should comprise the treatment of anxiety, fear and lack of self-confidence the athlete faces [9]. The emotion of fear is also related to the possible recurrence of the injury notably influencing the efficiency and intensity of training sessions, since the athlete does not dare to train with proper self-confidence and devotion [13]. In addition athletes are put under great stress by coaches and mates who push them to return and start their full training programme as soon as possible [14]. The experience of the rehabilitation programme in the perception of athletes may also continually change greatly influenced by the personality of the individual as well [15]. According to a study the majority of athletes come through three stages after suffering an injury: the first stage is of negation, the next is about experiencing increased stress, finally, high

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levels of coping characterize the stages. In the first days that follow the injury, athletes cannot show proper insight and understanding of their injury or its consequences, thus negation is typical at this stage. Later, stress appears with increased levels of anxiety, fear, anger, loss and depression coupled with low self-esteem. These negative emotions may even appear as a consequence of yearning for return at the end of the rehabilitation process. As soon as athletes go through these lows, they are able to cope with the new situation: they are determined, motivated and set new targets and can cooperate with the therapeutic team. The order and length of the mentioned stages vary according to individuals and can be easily tackled by applying diverse psychological methods [16].

To handle the injury, a specific strategy should be chosen –in which the personality traits of the athlete such as adaptation and optimistic attitudes are considered protective factors against the environment– thus athletes of the mentioned qualities can better cope with and accept their situation, as well as move on after the injury [17]. The mentioned idea is supported by a survey conducted among injured swimmers according to which athletes with pessimistic attitudes regarding their future carrier performed lower at later competitions in comparison with their peers who were optimistic [18]. Moreover, the age of the injured athlete also influences the success of tackling their situation. Teenagers can handle injury related issues best and they show the least signs of depression among the studied age groups [19], while older athletes often complained about depression, being exhausted, stressed or being in doubt besides somatic symptoms such as insomnia, lack of appetite and stomachache [20]. The gender of athletes is also decisive: it is more difficult to cope with injuries for female and they often demonstrate mechanisms of avoidance, anxiety and various states of stress [9]. Those athletes who did not have properly developed coping skills, or did not receive proper support by their families, had a need for a longer rehabilitation process compared to those individuals who had a more intense psychosocial support [21,22]. The supportive role of social background is apparent as well: injured athletes receive most support from their families and friends they turn to their coaches and team physicians with greater confidence in comparison with their habit

during the pre-injury period [23]. This finding has also been supported by another study according to which the three most important sources of social support in case of a sport injury are the team physician, the team –including the coach– and the family with the circle of friends [24]. Support promotes coping, reduces stress, the fear of being injured in the future, moreover and increases self-confidence and motivation [15] (Figure 1).

The emotional temperament and psychological state of individuals can be objectified by applying questionnaires during the rehabilitation process. There are various tests available and mostly “The Emotional Response of Athletes to Injury Questionnaire (ERAIQ)”, the “Tampa Scale of Kinesiophobia (TSK)” and “The Return to Sport after Serious Injury Questionnaire (RSSIQ)” are used [25-27]. In the ERAIQ individuals who complete the test provide an account on the circumstances, the type of the injury, on the characteristic features of the training programme and their feelings regarding the actual or previous injuries. A range of question types are applied in order to collect all data such as: yes-no questions, open questions, scales from 1 to 5 or 1 to 10, as well as supported questions occur in the test [13]. TSK is a test composed of 17 statements to estimate the rate of fear regarding reinjury. Athletes provide answers on a 4-point Likert scale whether to what extent they agree with a given statement. The higher scores gained indicates more fear of a possible reinjury [27]. RSSIQ consists of 21 questions to examine the cognitive, emotional and behavioural responses of athletes to an injury with scores gained from a 7-point Likert scale as well [26].

Data and Methods

Having completed a thorough overview of literature we set up a questionnaire of 28 items in October 2014, which was completed by ankle-injured athletes between October and December in 2014. A sum of 96 athletes answered the questions of whom 54 respondents completed the questionnaire online and 42 received printed copies. The students of The Institution of Physical Education and Sport Sciences in the Faculty of Sciences at Pécs University received the questionnaires,

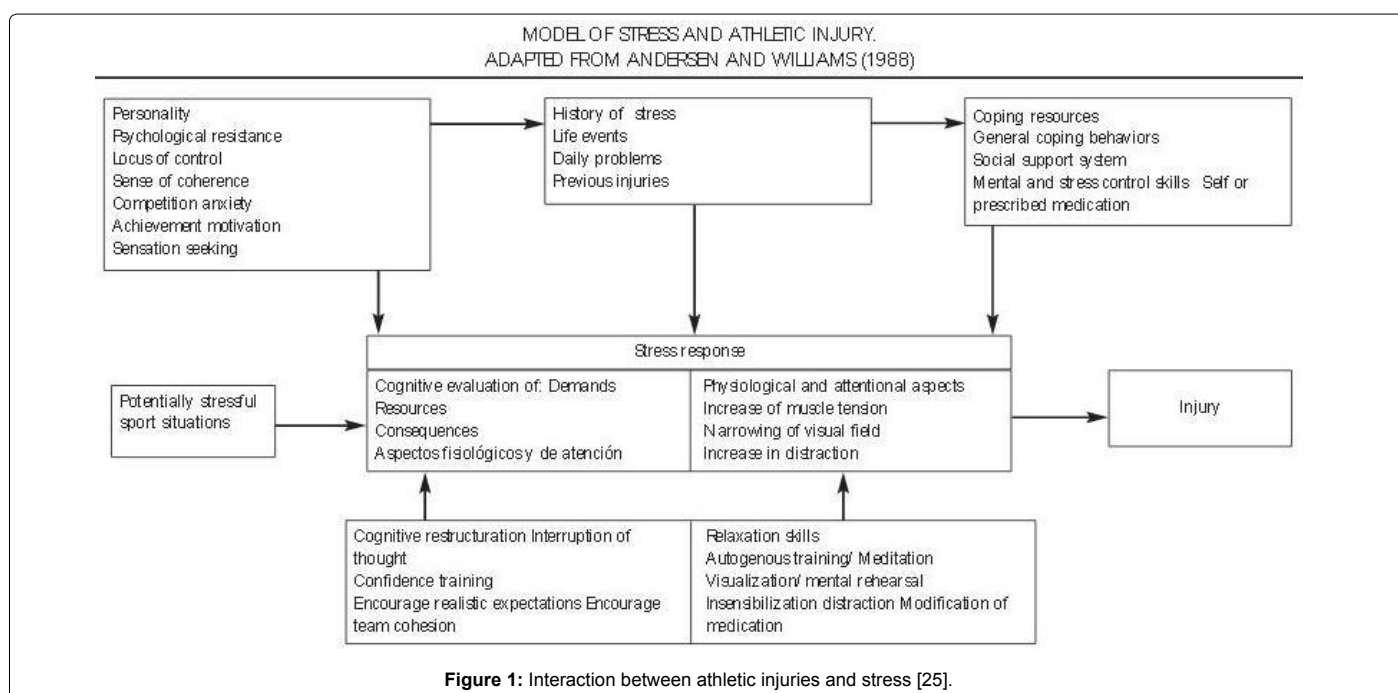


Figure 1: Interaction between athletic injuries and stress [25].

who, obviously do sports regularly and even take part in professional competitions and have a greater view on the effects of athletic injuries. Even more people could be reached online and we could collect data from different age groups and various regions of the country. Each person who completed the form had suffered an ankle injury related to doing sports, so they could provide authentic accounts of their feelings and experiences. The questions could be divided into two groups. The first 10 questions had the purpose to collect information about the person completing the questionnaire regarding some data on gender, age, the type of sport activity, the professional level of sport activity and about the circumstance of the injury. By the rest of the 18 questions, athletes were asked about the treatment received immediately after the injury and during the rehabilitation process, about the stress following the injury and the related strategies of coping, about the motivation of the individual, his or her attitude, as well as about conflicts that may occurred as a consequence of the injury. These data were surveyed by using yes-no questions, open-ended questions and a 5-point Likert scale. Data were processed by SPSS software in February 2015. Results were evaluated by the application of logistic regression, Pearson's Correlation Analysis, dual T-probe, and the Mann Whitney and Wilcoxon test. The tables and bar charts were created by Microsoft Excel, while pie charts were designed by the SPSS software.

Results

59% of all the athletes completing the questionnaire (n=96) were male and regarding age, most of the surveyed people belonged to the 21-25 age group. Only 21% of responding people were beyond 25 years of age. Considering the field or type of sport most of the people completing the survey played some kind of a ball game: one quarter of the athletes played football, 24% played handball, the third most popular sport was basketball. Nevertheless, volleyball and water polo players, dancers as well as martial artists also helped us in our work. 56 contracted professional athletes completed the questionnaire and most of them were members of division I of the county championship/league. 13 athletes answering the survey belonged to the Hungarian national team. 42.7% of athletes were members in division I, II or III of the National Championship. 11 people who pursue sports for a hobby also completed our questionnaire (Tables 1-3).

Partial ankle ligament tear was found to occur most frequently of sport injuries. 81.3% of the athletes who completed the questionnaire had had such an injury at least once in their sports carrier. Apparently, partial ankle ligament tear may easily lead to chronic instability, since 46.9% of the athletes surveyed had suffered an accident resulting in the mentioned problem at least twice. Only 30.6% of the surveyed athletes had suffered of complete ankle ligament tear and the least frequent injury of the ankle was its rupture: 20.2% of the surveyed individuals had had such an accident while doing sports (Figure 2).

Current experiences support the findings of previous studies that most of the injuries are suffered after warming up, but before cooling down, in the main section of the training session or during the match itself: 84.3% of our surveyed athletes got injured in the mentioned sections of sport events. The cause is easy to understand, since most of the ankle injuries take place in player-to-player contact and the hardest athletes should work is the main section of the match or of the training session, all increasing the risk of suffering injuries. Most of the respondents, 80.1% got injured in competition or training, while 19.9% suffered an injury while doing sports as free-time activity. The explanation could be the fact that there is greater stress on athletes in high-stake situations, or even during a training conducted by their coach, when tension may even manifest in the form of an injury (Figure 3).

Prying into the reasons of the injury, 49% of the questioned athletes found they were responsible for the event, one quarter of them found their opponent responsible, 11.4% blamed their coach or training mate, while 10.4% reported their circumstances, as the poor quality of the sports field, responsible or thought the accident took place by chance. Next, they had to judge the acute treatment and the rehabilitation process of their injury on a 5-point Likert-scale: those who gave mark 1 were not satisfied with the received treatment and felt they were not taken care of, while those who gave mark 5 were totally satisfied with both their post-injury treatment and the rehabilitation. Only 15.6% of the athletes felt they were properly taken care of in the first few minutes and hours following their injury, while 25% were particularly satisfied with the received rehabilitation. Regarding non-contracted athletes, there was no significant difference found between the acute treatment and the rehabilitation process in their judgement, however, contracted athletes found acute treatment 3 times worse in comparison to

| | Gender | | Age | | | | |
|-----------------|--------|--------|-------|-------|-------|-------|-----|
| | Male | Female | 15-20 | 21-25 | 26-30 | 31-40 | 40- |
| Athletes | 57 | 39 | 25 | 50 | 8 | 9 | 4 |
| Percent | 59% | 41% | 26% | 52% | 8% | 9% | 4% |

Table 1: Distribution of respondents according to gender and age groups.

| | Respective Sport | | | | | | | |
|-----------------|------------------|------------|----------|------------|-------|--------------|--------|------------|
| | Football | Basketball | Handball | Volleyball | Dance | Martial Arts | Other | Water Polo |
| Athletes | 24 | 20 | 23 | 8 | 5 | 4 | 11 | 1 |
| Percent | 25% | 20,80% | 24% | 8,30% | 5,20% | 4,20% | 11,50% | 1% |

Table 2: Distribution of respondents according to respective sports.

| | Level Of Sport | | | | | | Member Of A Sport Club | |
|-----------------|----------------|-------------|--------------|---------------|-----------------|--------|------------------------|-----|
| | National Team | Division I. | Division II. | Division III. | Lower Divisions | Hobby | No | Yes |
| Athletes | 13 | 19 | 15 | 7 | 31 | 11 | 40 | 56 |
| Percent | 13,50% | 19,80% | 15,60% | 7,30% | 32,30% | 11,50% | 42% | 58% |

Table 3: Distribution of respondents according to their achieved levels in doing sports.

Distribution of injures according to respective types

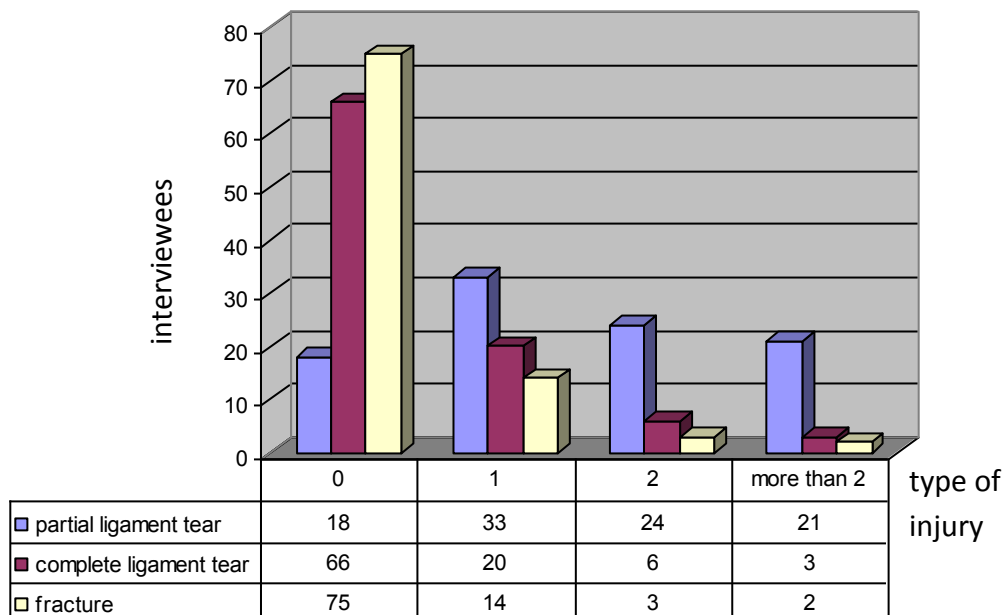
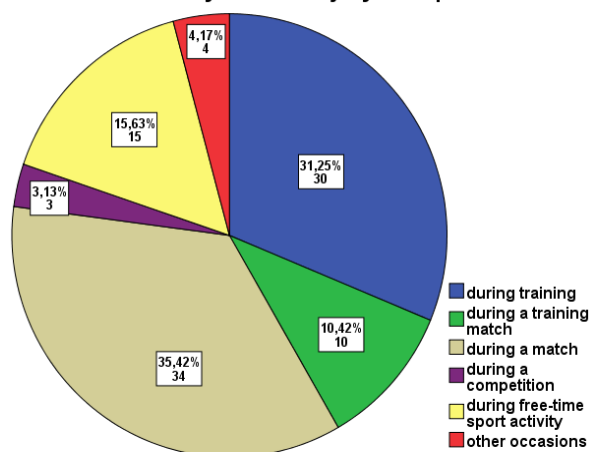


Figure 2: Distribution of injuries according to respective types.

When did your last injury take place?



When did your last injury take place?

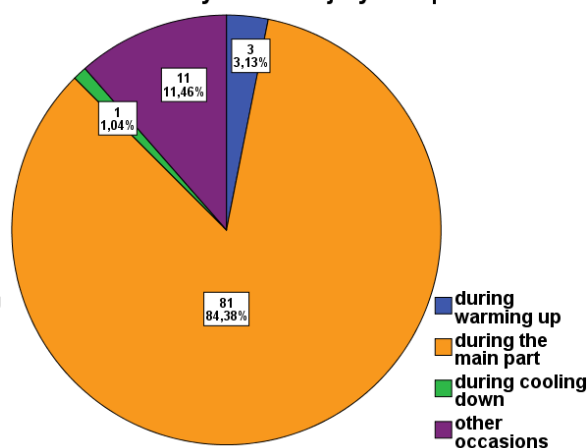
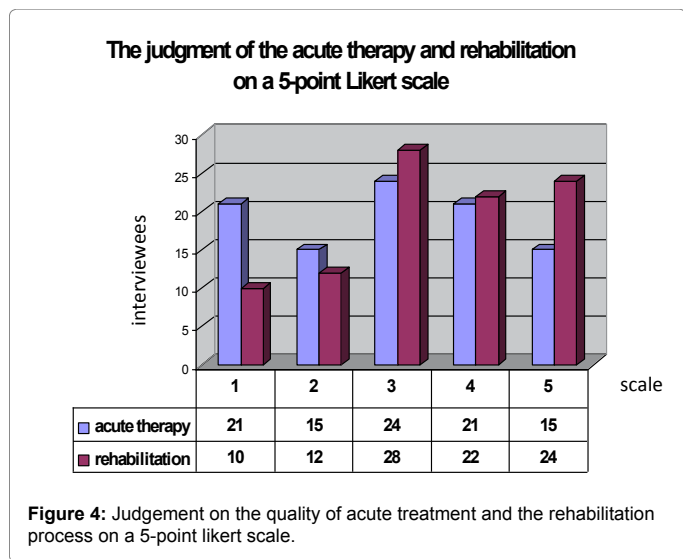


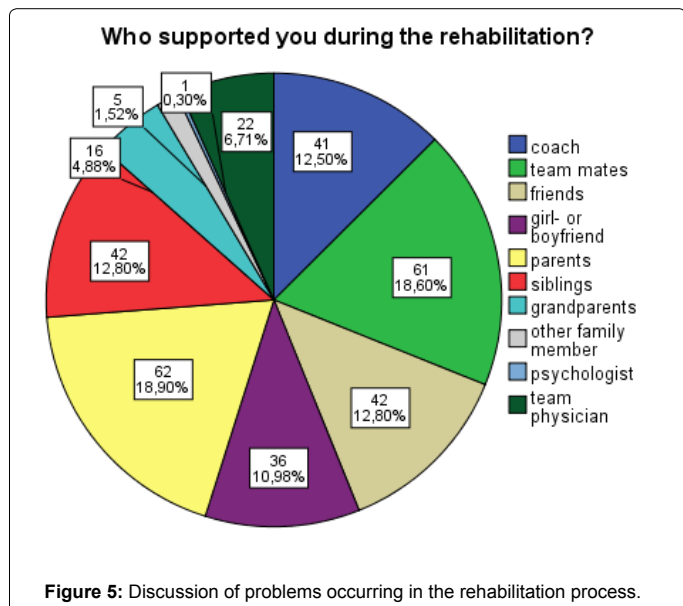
Figure 3: Distribution of injuries according to the time of occurrence.

rehabilitation ($p=0.001$, $OR=-3.179$). The social support by teammates reducing the levels of anxiety and frustration during the rehabilitation period can largely contribute to the mentioned results. There was no significant correlation found between age groups and the quality of the rehabilitation ($p=0.985$). We can infer from our results that the athletes who were more satisfied with their rehabilitation were also more motivated during the weeks of the process ($p=0.045$, correlation coefficient=0.205). Thus a high-level rehabilitation programme has a key role in a successful return later, since without proper motivation it is not possible to provide quality work in trainings (Figure 4).

The athletes provided honest accounts on their emotions and experiences of the minutes immediately following the injury. The most common emotions and thoughts mentioned were the following: dropping out of trainings, deserting teammates, anxiety, pain, anger, despair and the idea of the soonest possible return. Respondents had similar emotions during the weeks of the rehabilitation period, although hope, determination, confidence, persistence, strive, motivation and patience also appeared in the list. Based on our results, the positive or negative judgment regarding their experience of the rehabilitation process is greatly influenced by the quality of the rehabilitation



The respondents reported about their inner motivation and the work accomplished using a 5-point Likert-scale (1=no, 5=maximum). 81.3% of the athletes regarded themselves considerably or particularly motivated, accordingly 78.2% of them mostly or totally completed their assigned tasks in the rehabilitation programme. They closely correlate since even data show that those athletes who were more motivated were ready and more responsible in the completion of their training programme during the period of rehabilitation ($p < 0.01$, correlational coefficient=0.587) The quality of the accomplished work during rehabilitation was also greatly determined by what judgement the injured athletes formed about their treatment: the higher the level of rehabilitation was considered the better athletes could complete their assigned tasks ($p = 0.025$, correlational coefficient=0.229). Both correlations demonstrate the role of motivation really well which can be generated by setting up new goals and applying visualisation techniques. The support by the company of teammates can significantly enhance the motivation of the injured athlete. Nevertheless, an injury has various inevitable consequences: major issues include dropping out from matches, competitions, training sessions (36.1%), or from other team activities (23.2%), as well as the problem of reduced self-confidence occurs(19.35%) (Figure 6).



Only 8.3% of the respondents reported any injury related conflicts with their coaches, most of those found the reason in the attitude of the coach underrating the injury and forcing participation in matches or training sessions. 6.3% of the respondents had an argument with their teammates. The main reason was the improper attitude on behalf of mates towards the injury the athlete suffered. It was interesting to observe that those athletes who had conflicts with their teammates were 7 times more likely to face a conflict with their coaches as well ($p = 0.043$, $OR = 7.000$). Thus we could infer that a proper inquiry into the character of athletes, the careful exploration of their personality traits by a professional is necessary, since those who release their anxiety and fear by confronting their environment cannot adequately cope with stress situations. Recognizing the phenomenon, a well-designed psychological counselling can result in proper stress management and reaching a stress-free state. Being asked about failures in the period that followed the injury, quarter of the athletes found they did not face any failure after the rehabilitation process. Nevertheless, on the 5-point Likert scale 13.5% of the respondents mostly attributed any failure that occurred to their previous injury, where according to the result of the Mann-Whitney test there were twice more athletes from division II of the national league or from lower ranks ($p = 0.043$, $OR = -2.027$). In this case the factor of social support should be underscored again, since the higher-level the athlete pursues sports the more cohesive the team and skilled his coach is and both circumstances can provide more support for the individual. Moreover, regarding division I teams of the national league there is often greater attention paid to the bio-psychosocial treatment of injuries even by including a psychologist. Thus, in such cases athletes can better cope with their injuries and would not necessarily attribute failures to previous injuries. 17.9% of the respondents reported they thought of giving up sports during the rehabilitation programme referring to the injury during which fact also correlated with their rate of motivation: the more motivated the individual was the less he or she thought of giving up sports ($p = 0.006$, correlational coefficient=0.283). This data also supports the significant role of motivation. Any degree of fear regarding reinjury determines the daily life of athletes, since only 27.1% of them reported absolutely no concern for suffering a possible reinjury on a 5-point Likert-scale. The emerging idea of giving up sports may also be greatly influenced by the above mentioned factor as those who have more concern for reinjury

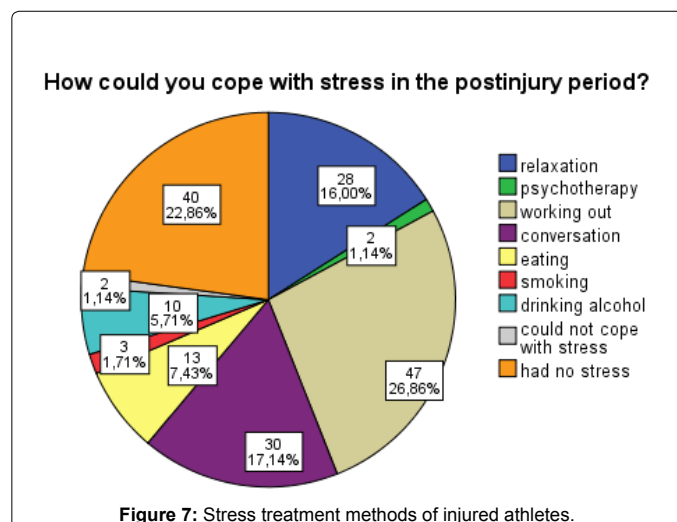
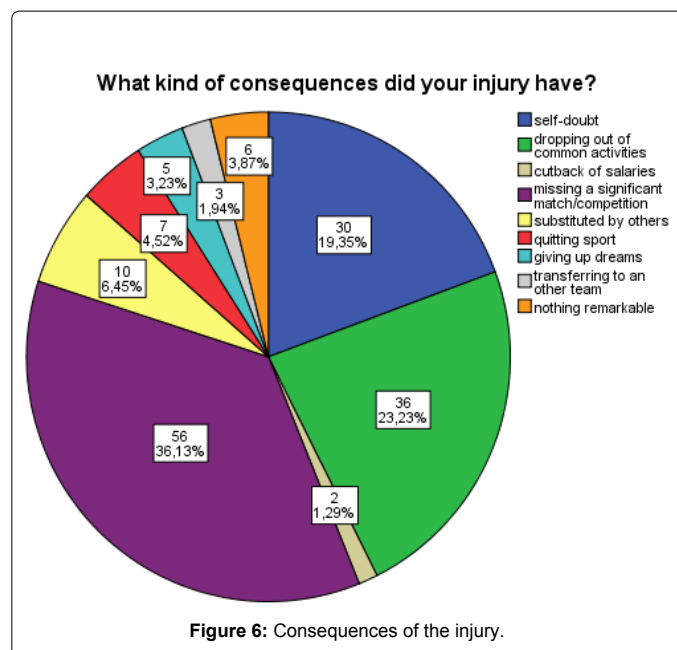
programme: those who evaluated rehabilitation more positively also had a more positive attitude to the process ($p < 0.01$, correlational coefficient=0.414). Those who had a positive experience of their rehabilitation were four times more satisfied with their treatment as well ($p = 0.0004$, $OR = 4.643$). Data shows it is worth to develop a positive attitude among athletes to which cognitive therapy could be a great solution. The problems of athletes that emerge during the rehabilitation process are readily shared with those who they feel close to. Results also suggest the significant role of families in support: 38.1% of athletes seek help at a family member. 31.1% of the respondents share their thoughts with their coaches or teammates, while 23.8% of them turn to friends or their partner to discuss about their emotions. It is interesting that only one respondent requested counselling at a psychologist to help process experiences. The latter fact supports our endeavour that the training of coaches and sports medicine doctors in the field of psychology is indispensable in order to help athletes develop their proper methods to cope with stress (Figure 5).

are more likely to give up sports subsequently ($p=0.004$, correlational coefficient= -0.291). A psychologist should be assigned to treat and eliminate fear, but when failing the support by a professional of the field the coach and the sports medicine doctor undertake these tasks to find a way out. Overcoming fear means a greater chance for the athlete to continue sport activity. On the basis of stress treatment knowledge and methods we could conclude that 22.8% of the respondents did not feel stress in the period following the injury and 61.1% of the athletes who experienced increased stress were able to reduce anxiety adequately with motoric activity, relaxation, psychotherapy or conversation. Others were either not able to cope with stress or did it in an inadequate manner by: eating, smoking or consuming alcohol. Interestingly only 19 respondents referred to inadequate modes of stress reduction of whom only 3 were recreational athletes and 16 were higher ranking athletes. It should be noted that trainings are an excellent way for athletes to reduce their everyday stress levels, thus the relatively inactive period prescribed for them following the injury may be experienced as a period of anxiety by an athlete (Figure 7).

Finally, we asked the respondents to summarize their feelings, thoughts and experiences of their injuries suffered in one word or a sentence. Most often the followings were mentioned: fear, fright, pain, misfortune, inability, disappointment, hope. One of the respondents expressed his opinion that injury is an inevitable part of professional sport participation and whatever does not kill you makes you stronger. Based on these findings it turns out that several athletes ($n=26$) considered their injury positively, these results may originate in their more conscientious and determined approach to assigned tasks during the rehabilitation process ($p=0.001$, correlational coefficient= -0.349). A tight correlation between the fear of reinjury and posterior judgement of the injury was observed: those who only highlighted negative experiences regarding their injury showed more fear of a possible reinjury during the rehabilitation process ($p<0.01$, correlational coefficient= 0.514). These findings also support our proposition that the quality of the acute treatment and the rehabilitation process greatly influence the psychological state, the motivation and attitude to return as well as their experience of the injury and the later judgment of events.

Conclusion

On the basis of the above findings it is evident that proper communication between the therapeutic team and the injured athletes, the empathy among medical professionals towards athletes and a well- designed rehabilitation programme are all essential to make the recovery as quick as possible [10,28]. According to a meta-analysis of 34 examined publications in the topic, more than the half recommended to incorporate the acquisition and development of communication skills, cognitive replanning, motivational methods, relaxation and visualisation techniques, the athletes could apply in case of an injury during the rehabilitation process [29]. Unfortunately, several other studies came to the conclusion that injured athletes do not seek help from psychologists, thus it is worth organising psychology related programmes for them such as communication, confidence and contact building, stress and conflict management trainings in order to support their self-help [10,13]. Another comprehensive study also indicated the advantages of intervention in rehabilitation: to reduce anxiety patient education is inevitable, so in the course of the psychological preparation of athletes information should be disseminated about the anatomy of a possible injury, the process of rehabilitation, and they have to be honestly informed about difficulties of the post-injury period. The articulation of both long and short term goals are to be considered



to enhance confidence and reduce frustration. Athletes can use their faculty of imagination and visualise how they are accomplishing a movement without feeling pain, or are playing in front of the cheering supporters and win a match or competition. By the application of cognitive replanning they can recognise and eliminate negative feelings and develop positive attitudes instead [15]. The most complex support is required for those who face difficulties in and are slow in coping with their experiences. Irritated behaviour, frequent changes in the mood of the injured person, gratuitous fear of reinjury, negating the serious character of the injury, blaming oneself for deserting the team, or overt speculations about one's return are all possible indicators [28]. In case of sport injuries the best solution is to prevent musculoskeletal injuries, therefore as part of primary prevention great emphasis should be laid on the psychological guidance of athletes [9,30]. Just as athletes physically prepare for competitions and matches on a daily basis, they should also prepare for challenges psychologically with the same intensity [13,31].

Experiences of our research support the idea that sport psychology

has its place in science. Our results may contribute to attain higher levels in team building, training work and preparation for competitions, be it professional or recreational sport activity. Discovering the complexity of sport and the significance of psychological factors, we can better understand the causes, effects and consequences of respective sport injuries.

By our research work we intended to both call attention and find justification to the psychological guidance in case of ankle injuries, to the necessity of individual rehabilitation, as well as to the importance of psychological training of coaches and sports medicine doctors.

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