Original Article

Relationship between emotional intelligence and the injury occurrence rate in elite athletes of various martial fields

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Abstract

Introduction: Emotional intelligence (EI) it's a skill set that have ability to cope successfully with demands and have affect on the environment pressures. Athletic performance is mostly affected by the factors that create a common stress in sport that may be associated with risk of injury. Hence, the purpose of this study was to relationship between EI and the injury occurrence rate in elite athletes of various martial fields.

Materials and Methods: In this study, 110 elite men athletes in the Tehran city who were active in various martial fields in 2016, completed Lane et al. (2009) questionnaire of EI at sport. Information about the injury of the previous year was collected through reports tab of sports injuries, interview with athletes and these data were analyzed in Faculty of Physical Education, University of Tehran. To investigate the relationship between variables Pearson's correlation method was used.

Results: The Pearson's correlation analysis showed that there is a negative and significant relationship between the number of sports injuries for martial elite athletes and each of the six factors of EI. But, statistically this relationship was significant only in three factors the number of injuries-appraisal of others emotions (P=0.027, r= -0.211), number of injuries-appraisal of own emotions (P=0.015, r= -0.232), number of injuries- self-regulation (P=0.018, r= -0.225).

Conclusion: Low EI and lack of appropriate evaluation and adjustment of emotions might be through disorder of external senses of athletes and increasing the muscle tension can make interfere with a person's neuromuscular coordination and increases the injury risk of athletes.

Keywords: Athletic injuries, Elite, Emotional intelligence, Martial arts

Introduction

Participation in sport activities is accompanied with a higher quality of life (1) positive effect on behavior (2), better physical and mental health (3,4). Despite such benefits, increased physical activity is associated with an increased risk of injury (5). Sports injuries are a problem that most athletes face during their sport lives, which has concerns for athletes and coaches (6). Those injuries related to sports and recreational activities in the United States that medical care received has caused one in five students and

more than one in four active adults experience one or more day time lost from school or work (7). In addition to the short-term effects of sports injuries, long-term complications, such as arthritis, can be associated with continuous decline in physical capacity (8).

Although sports injuries are an inevitable part of sports activities, been done extensive efforts to increase awareness and prevention of injuries and damages resulting from it. Models that emphasize the risk of specific injury factors are the model of the effect of psychological factors on the incidence of sport injury with the three distinct classes of psychological stressors, coping resources and emotional state, and the last model of the risk factors of injury affects personality factors (9). One of the important personality traits which seem to affect athletes' performance in stressful situations such as sport situations and to prevent the effect of the inhibiting factors is emotional intelligence (EI) (10). In general, the concept of EI is explained by two approaches. The first approach is the capability approach proposed by Meyer and Salovey in 1990. According to this approach, EI consists of four levels of emotional ability: emotional perception, emotional empathy of thinking, emotional comprehension, and emotional management (11,12). The second approach is a combined approach and has been proposed by Bar`an in 1997. According to this approach, EI is a complex of non-cognitive abilities, abilities and skills that affect the ability of a successful encounter with the demands, requirements and pressures of the environment. This approach involves a pattern of Bar`an that EI is a combination of emotional self-awareness, as well as other skills and features knows that affect the individual's ability to cope with the stresses and demands of the environment (13). In this regard, exercise performance is also largely influenced by common stressors in sports such as committing a psychological or physical error, suffering from pain and discomfort, observing fraud or rivalry, receiving referee fines and reprimanding from the instructor (14). In addition, research findings have shown that disability in effective coping with sport stress is detrimental to athlete's performance and personal satisfaction (15); this means that if athletes are not able to control stressful situations, their performance will not only decrease but also they may also be injured (10).

So far, few studies have looked at the structure of EI in the field of sports. For example, Saklofske et al. conducted a field study entitled "the relationship between EI, personality and exercise" concluded that EI predict relationships between personality and behavior in sports training (16). Perlini and Halverson in a study entitled "EI of athletes Canadian national hockey league" concluded that EI has a positive effect on athletes score (17). Van Rooy et al. with a comparison of EI between men and women concluded that there are significant differences between men and women of EI and women are more EI than men (18). Zizzi et al. found EI was associated significantly with sport performance among college basketball players (19), whereas Thelwell et al. found that EI related with perceptions of coaching effectiveness (20). In addition, it has been shown that high emotional intelligence has a positive correlation with problem-solving ability, immutability, low anxiety and anger control (21). However, interactions in sports activities cause athletes to be involved with emotions such as happiness, anger, heartbeat, hopelessness and stress. Therefore, the question arises as to whether there may be opportunities in sporting environments which is provided in terms of emotion and its management; is there a relationship between EI and the injury occurrence? Therefore, with regard to the consequences of sport injuries and the importance of EI and reports on the high levels of anger and aggression among martial athletes compared to non-athletes (22,23), the purpose of this study was to investigate the relationship between EI and injury occurrence rate in elite athletes of various martial fields.

Materials and Methods

The present research is a descriptive-correlational study that aimed to investigate the relationship between EI and rate of injury in elite athletes of various martial fields. The statistical population of this research was Tehran city of active elite athletes in different martial fields such as Taekwondo, Judo, Kung Fu, Karate and Boxing in 2016. According to Vaeyens et al. elite athletes are those who are at the highest possible level for their age group or have a history of being invited to the national team (24). With regard to the scattering of subjects in various sports, data collection was

done using convenient sampling method. For this purpose, based on the methodology of previous studies related to the subject of research, 110 martial athletes with an average age of 23.35 ± 2.14 years who had the above conditions (elite), after the necessary explanations for the objectives of the study and completion consent form was participated in this research. This study was approved by the Ethics Committee of University of Tehran. In order to comply with ethical and human issues, all subjects were assured that all personal data was reserved to the researcher and only the overall results would be exploited. Despite the fact that the subject did not know the purpose of the research, however, since all subjects were active and elite athletes, and had a constant training throughout the week, and this was as much as possible controlled.The criteria for entry into the research included the elite conditions in the martial fields desired by the researchers, the age range of 20-25 years, the lack of mental disorders and satisfaction to participate in the research. The exclusion criteria include not answering all the questions of the questionnaire, the lack of knowledge of the subjects about the number and type of their injuries, the incorrect answers to the questionnaire questions.

Research instrument

A) Lane et al. emotional intelligence questionnaire: To measure the EI, Lane et al. questionnaire of the EI at sport which is designed based on Schutte et al., Austin et al. and based on the Meyer and Salovey model research, has been used (11). This questionnaire is a self-rating scale including 33 items and six factors which is included appraisal of others emotions (questions 1-7), appraisal of own emotions (questions 8-12), self-regulation (questions 13-17), social skills (questions 18-22), utilization of emotions (questions 23-29) and optimism (questions 30-33). The items are presented as declarative and interrogative sentences. The answers of each items based on five point Likert-type scale from 1 (completely disagree) to 5 (completely agree) are scored. Lane et al. by studied factor structure of the questionnaire among English athlete's students using confirmatory factor analysis. The results confirming the five-factor of the instrument that was included appraisal of others emotions, appraisal of own emotions, self-regulation, social skills, utilization of emotions and the optimism did not achieve proper correlation with the EI (25).

Nevertheless, results of factor analysis in Persian version of this questionnaire done by Eydi et al. in Iran indicated that six-factor structure in terms of separated questions and compliance with principles is appropriate. Reliability of results using Cronbach's Alpha for the six components was between 0.73 and 0.79 (appraisal of others emotions =0.76, appraisal of own emotions =0.77, self-regulation =0.79, social skills =0.78, utilization of emotions =0.75 and the optimism =0.79) that shows the proper reliability of tools. The reasons of disruption of alignment likely refer to the respondent's cultural conditions, society and different sample (26). Similarly, in the research six-factor questionnaire was used.

B) Reports tab of sports injuries: Based on previous studies reports tab of sports injuries in various body parts (neck, shoulder, humorous, elbow, forearm, wrist and fingers, hip, femur, knee, calf, ankle, etc.) including fracture, sprain and strain was used for injury occurrence (27). Reports tab of sports injuries were used in the study of Ghafouri et al. in the student Olympiad competitions of the ministries of health and medical education and the Ministry of Science and Research and Technology and had a validity and reliability of 0.86 (28). This form was completed by interview with athletes. Participants were required to report only those injuries that required medical attention or withdrawal from training for one day or more (29). Finally, total number of injuries was used in the statistical analysis analyzed in Faculty of Physical Education, University of Tehran.The raw data obtained from measurements of variables of this study were analyzed by using SPSS. 22, and descriptive and inferential statistics. According to the result of the one sample Kolmogorov-Smirnov test ($P>0.05$), a Pearson's correlation analysis was used to assign the relationship among the variables. Significance level was considered to be 95%, with alpha being ($P≤0.05$).

Results

The results of the analysis of the findings showed that the athletes who participated in the study in a previous were suffered from on average 1.83 ± 1.23 injuries for 110 athlete per year. The average of their scores in six components of EI is also shown in Table 1.
The Pearson's correlation analysis is also shown in Table 2.

Table 1. Demographic characteristics of subjects

Variable	Mean	Std. Deviation
Age (Year)	23.35	2.14
Weight (kg)	76.23	5.6
Height (meter)	1.79	0.35
Number of injury	1.83	1.23
Appraisal of others emotions	23.75	3.61
Appraisal of own emotions	21.17	3.03
Self- Regulation	19.03	2.99
Social Skills	19.16	2.61
Utilization of emotions	24.95	4.74
Optimism	15.74	2.91

Table 2. Correlation matrix among the study variables

Variables	R	P
Appraisal of others emotions	-0.211*	0.027
Appraisal of own emotions	-0.232*	0.015
Self- regulation	-0.225*	0.018
Social skills	-0.105	0.275
Utilization of emotions	-0.168	0.079
Optimism	-0.138	0.151

*- Correlation is significant at 0.05 (2-tailed).

Discussion

Having EI skills can play an important role in correct and proper use of strategies for athletic orientation in dealing with problems and preventing malicious behaviors such as aggression and anger (30). The results of this study showed that there is a negative relationship between the EI and the probability of rate of injury in elite athletes of different martial arts. This means that with increasing EI, the risk of injury in people decreases and vice versa. But statistically, this relationship was only significant in the three components of appraisal of others emotions, appraisal of own emotions and self-regulation with the rate of injury. Our results are consistent with Kalkhoran et al. They studied the relationship between the EI and the risk of injury in wrestlers and the results represented that there was a significant relationship negatively between these variables. Their measuring tool of the EI was the EI scale of Schutte et al. including 4 subscale ability to regulate emotion, ability to utilize emotion, ability to evaluate emotion and ability to generally regulate emotion that all four subscale had a significant relationship with the risk of injury and it showed that the results are overlapped with the current research (31). From the differences of their study with this research, different samples, different EI questionnaire and possibly the method of collecting information about athletes' injury were noted.

In justifying a significant relationship between the components of appraisal of others emotions, appraisal of own emotions and self-regulation with the rate of injury, it should be said that EI can be effective on athlete's mental health through mediating effect (32).

There is evidence that some forms of EI may protect individuals from stress and, consequently, lead to better adaptation. For example, in the research of Ciarrochi and Deane, emotional management skills were associated with the tendency to maintain a positive mood-induced state of affairs empirically, which has obvious implications for the prevention of depression. Athletes who are able to control the emotions of others have more social support and satisfaction, and such protection can lead to immunity from depression and anxiety (33). In explaining the insignificance of the relationship between the components of social skills, utilization of emotions and optimism with the rate of injury, it seems that these components indirectly affect the injury of elite athletes and interact with other risk factors such as the mental skills, and not as effective as three other components in this area.

Pellitteri examined the relationship between the components of EI and defense mechanisms. Correlation analysis of two variables showed that there was a significant positive correlation between developed styles of defensive and EI. This means that those who have adaptive defense mechanisms (enhanced) have a higher EI than those who are using non-reared defense mechanisms (34). Defensive mechanisms are defined as a group of mental activities that hold unacceptable thoughts, impulses and aspirations to protect individuals from increasing anxiety to increase self-esteem or to protect their integrity outside the consciousness area. (35). Therefore, considering the definition of EI as the ability to understand and manage emotions, those who have higher EI will be able to manage their emotions with higher psychological adaptability and use more adaptive mechanisms.

Therefore, emotions are experienced at different levels of consciousness and the individual is not aware of some emotions or their effects on their behavior. A higher EI allows a person to better manage, recognize, regulate, and evaluate emotions in the nonsense domain. Accordingly, it can be argued that EI influences the activities of the nonsense domain, including the individual's defense mechanisms. The ways of influencing EI on defensive mechanisms at the nonsense level can be found in the components of EI including management, recognition, regulation and emotion assessment. Therefore, if athletes are able to control and manage stressful conditions, their performance will not be reduced, but their risk of injury can be reduced (5).On the other hand, the components of EI are related to the processes of attention and perception. The higher the attention and perception of a person, he can the better record and perceive emotions in himself and others (36).Schulz and Brown found that the ability to understand and malfunction in the management of emotions in adolescents with lower EI is considered as the cause of maladaptive behavior of such adolescents (37). Ivarsson also argues that high concentration during exercise and competition plays a significant role in reducing sport injuries (38). Kerr and Fowler also stated that having stress response skills can have a positive effect on the increased concentration of athletes, which reduces injuries to the athlete (39). All of the above can be a reason for the findings of the present study, which showed a significant negative relationship between EI and injury occurrence. In fact, EI is one of the skills to coping with stress (40).

For this reason, the findings of this study are consistent with Williams and Anderson's injury stress model. Based on this model, prestigious sports situations (such as competition, important exercises and poor performances) may play a role in injuries through disturbances in the external senses of athletes and increased muscle tension that can lead to a person's neuromuscular coordination disorder (41). Finally, due to the fact that various factors are involved in the occurrence of injuries, we cannot consider one of them as the cause of injury and in full association with it. Therefore, given the little research done in this field, further research is needed to in order to achieve complete and more generalized results and address the limitations of this research, including the lack of control of the mental status of individuals, the use of only male samples, retrospective, and non-evaluation of the opinion variable should be done only at the elite level.

It is also suggested that in a prospective study to be investigated of EI as a predictor of injury in sport. In addition, it can be used to investigate the effect of psychological interventions in the field of EI on athlete's injury.

Conclusion

The results of this study showed that there is a negative correlation between the emotional intelligence and the probability of injury in elite athletes of martial arts. These aspects, along with other risk factors such as psychological factors, may affect the injury in athletes. A significant relationship between emotional intelligence and injury occurrence it shows that a person who has the ability to better understand the others changes of mood, properly identifying, controlling and managing your own and others' emotions and it prevents the sudden alteration of emotions into negative responses, which can reduce the incidence of sports injuries.

Therefore, it is recommended to the coaches, sports pathologists and sports psychologists work with the training of EI skills (with regard to their acquired status) and psychological skills in preventing and reducing the likelihood of injury to athletes.

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