Mental Imagery Ability in Injured and Uninjured Elite Professional Soccer and Volleyball Players

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Abstract: The purpose of this investigation was to determine the amount of mental imagery ability in injured and uninjured Iranian professional soccer and volleyball players. Two Iranian soccer premier leagues and two volleyball premier league clubs participated in this study. VVIQ & VMIQ were used to measure the ability of participants’ mental imagery. Also, Fuller's questionnaire [9] was used to evaluate the incidence of the players’ injury. An independent t-test was used to analyze the data. The results of this study revealed that for soccer players, a significant difference existed in the internal imagery ability between injured and uninjured players while no significant difference was found in external mental imagery between injured and uninjured players. For volleyball players, in internal mental imagery ability and external mental imagery, no significant difference was found between the injured and uninjured players. Based on the finding of this study, soccer players with higher internal imagery ability are more prone to injury.

Key words: Internal Mental Imagery % External Mental Imagery % Sport Injury

INTRODUCTION

At present, science and technology tremendously influence physical activities. Application of science in sport is widespread. Sport psychology is a science which has a very important role in improving sport performance. One area of sport psychology is mental imagery which is also called mental rehearsal. It is an experience that resembles sporting experience but occurs without an actual activity being performed. It is a mental skill which is applicable to various situations. There are two kinds of mental imagery: internal and external. When a player creates a skill and rehearses it in his/her mind, it is called internal mental imagery; when a player watches himself/herself in his/her mind performing as a spectator, it is called external mental imagery. Mental imagery ability is different among people and can be improved with practice. Mental imagery ability thus is a technique which is widely used for enhancing sport performance [1].

Sport injury is an undesired part of competitive sports. Prevention of injury is an important part of the game strategy and requires special attention. Researches have shown that mental imagery could enhance the healing process of injury [2]. Mental imagery techniques have been developed in hospitals and clinic settings to improve the effectiveness of medical treatment interventions [3, 4].

Lyeen Evans et al. (2006) reported positive effect of mental imagery practice on sport injury rehabilitation [5]. Richardson et al. (1995) in their investigation of relationship between mental imagery practice and rehabilitation of sport injury concluded that athletes with knee injury who performed 10 minutes of mental imagery practice, three times a day, could walk with less pain after one week [6]. The result of Poltrock's (2002) study indicated that mental imagery ability is very personal and clearness of imagery is different among individuals [7]. Mulder (2007) investigated the relationship between age and capacity of mental imagery. The results indicated that older people have less capacity of imagery [8]. Allami et al. (2007) in their study of motor learning with combination of different rates of motor imagery and physical practice concluded that motor imagery is beneficial for motor learning and maybe a good substitution for motor practice in rehabilitation clinic [9]. No study has been found in which mental imagery ability in injured and uninjured sport players was investigated.

It has been shown that mental imagery enhances motor task acquisition and athletic performance (for a complete review, see Feltz & Landers, 1983) [10]. Besides, studies have shown that imagery could enhance the healing process of injury. However, the question...
which was attempted to be answered by the present investigation was that whether there was any difference in the ability of mental imagery between injured and uninjured elite soccer and volleyball players. The question would provide us with the fact that whether mental imagery ability, by itself, affects the incidence of injury.

**MATERIALS AND METHODS**

**Participants:** 32 Iranian professional soccer players (Mean age: 24±2.1 years) and 17 volleyball professional players (Mean age: 25±4.8 years) participated in this study. All of the subjects were in a reasonable good health and physical condition. The Committee for Ethical Considerations in Human Experimentation of the College of Physical Education and Sport Sciences, University of Isfahan, Iran assessed and approved the experimental protocol. Players who had experienced a moderate or severe injury during a full season were considered as injured athletes.

**Materials:** We used the Vividness of Visual Imagery Questionnaire (VVIQ) [11] and the Vividness of Movement Imagery Questionnaire (VMIQ) [12] to assess the subjects' ability of internal and external mental imagery. There are 16 items in the VVIQ referring to different situations that the subjects are asked to visualize and rating the image vividness on a 5-point scale. The subjects first completed the questionnaire with their eyes closed. The scores ranged from 16 to 80. A low score on the questionnaire indicates high imaging capacity. The internal consistency of the questionnaire is high [13]. VMIQ requires the participants to separately form a kinesthetic and a visual image of each of the 24 situations. We used a 5-point scale to assess vividness of imagery. The VMIQ scores ranged from 24 to 120 (the lower the score, the greater the vividness) in the kinesthetic and in the visual ratings. It has been demonstrated that VMIQ has strong construct validity [11].

We also used a modified form of Fuller et al.’s (2006) questionnaire to evaluate the participants’ injury incidence [14]. To express the severity of injuries, the days of sport inactivity were presented in days. The days of sport inactivity were defined as the number of days in which the player was not able to play or train because of the injury sustained. The definition of Wong and Hong (2005) was used to define minor, moderate and severe injuries. 0-7 days of sport inactivity was defined as minor injury while 7 to 30 days of sport inactivity was defined as moderate injury and more than 30 days of sport absence was defined as severe injury [15].

**Statistical Analysis:** Statistical analysis was performed with an independent *t* test by SPSS software (Version 10.0). We set statistical significance at *p* < 0.05.

**Procedure:** The imagery was done in a lie-down position in complete silence and closed eyes. We asked the participants to calm their mind and relax their body. We provided them with a few minutes to relax and to get focused. If they got distracted while doing the imagery, we let them focus once more. Following imagery, we asked the participants to rate the image vividness on a 5-point scale. The lower the scores, the better the mental imagery ability. For internal mental imagery, we asked the subjects to imagine performing the task mentioned in VMIQ as if they are performing in their real life. For external imagery, we asked the subjects to imagine watching themselves from the perspective of an external observer as if they are viewing themselves on a movie screen performing the task mentioned in VVIQ. We told them not to focus on the kinesthetic feel of the VVIQ items [16].

**RESULTS**

Table 1 shows the mean and standard deviation of the participants’ weight, height and age.

Table 2 shows the mean and standard deviation of the external and internal mental imagery ability in injured and uninjured volleyball players.

Table 3 shows the mean and standard deviation of external and internal mental imagery ability in injured and uninjured soccer players.

To investigate whether there is a difference in the external mental imagery between injured and uninjured volleyball players, we compared the mean score of the external mental imagery ability that the injured volleyball players achieved with the mean score of the external mental imagery ability of uninjured volleyball players. We found no significant difference. Also, no significant difference was found when we compared the mean score of the internal mental imagery ability that the injured volleyball players achieved with the mean score of the internal mental imagery ability of uninjured volleyball players.
To investigate whether there is a difference in the external mental imagery between injured and uninjured soccer players, we compared the mean score of the external mental imagery ability that the injured soccer players achieved with the mean score of the external mental imagery ability of uninjured soccer players. We found no significant difference. We compared the mean score of the internal mental imagery ability that the injured soccer players achieved with the mean score of the internal mental imagery ability of uninjured soccer players. We found a significant difference, \( t(31) = 2.83, p<0.001 \).

**DISCUSSION AND CONCLUSION**

The results of this study revealed that a significant difference exists in the internal imagery ability between injured and uninjured soccer players while no significant difference was found in external mental imagery between injured and uninjured players. No significant difference was found in internal mental imagery ability and external mental imagery between the injured and uninjured volleyball players. Based on the finding of this study, soccer players with higher internal imagery ability are more prone to injury. In order to discuss this phenomenon, three scenarios can be suggested. First, higher imagery ability may have a positive impact on players’ self-confidence and as a result improve their arousal to a level that enhance their performance [17]. The higher level of self-confidence also could cause more perseverance to perform at a higher level which may put them in a higher risk of injury. Second, mental imagery ability is the ability to use senses for creating or rebuilding the past mental experience [2]. Players with higher internal imagery ability are better equipped to use internal senses to create a new skill or techniques which they have not experienced it so far. Thus, they might have put themselves at a risk of injury. Third, there are chances that players with higher internal imagery ability also have higher performance ability in which they might become a target for opponent players and this could cause them to be injured. It seems differences exist between contact and non-contact sport activity in case of mental imagery ability and sport injury incidence. In the non-contact sport such as volleyball, performer with higher mental imagery who may also have higher performance ability could not be charged with opponent player. In conclusion, soccer players with higher internal imagery ability should be aware of the risk of sport injury.

**REFERENCES**


