

EFFECTS OF IMAGERY ON ACUTE INJURY RECOVERY

Abdulhameed Al Kitani¹, Haider Darain², Irfan Ullah³

Abstract

INTRODUCTION: A combination of both physical and psychological intervention is essential during injury recovery and rehabilitation. However, little has been reported in the literature. This study was designed to assess the acutely injured footballer's beliefs and intention towards the use of psychological interventions of imagery and its types.

METHODS: A total of 18 acutely injured male participants volunteered for this trial and introduction to the use of imagery was given to all participants in two government hospitals in the Sultanate of Oman. All participants filled three questionnaires on three different occasions during injury recovery; pre and two post interventions (immediately after and three weeks after intervention).

RESULTS: The results showed that imagery's belief mean immediately after intervention was significantly greater than pre-intervention mean, and that 3 weeks post-intervention mean for imagery intention was significantly greater than the immediately post-intervention mean (dependent t-test). In addition, the results revealed that motivational imagery's intention had the most significant improvement 3 weeks post intervention than immediately post compared to the other types of imagery (healing imagery and pre-experience). The results of the current study had offered some evidence that imagery is a very useful tool that can be used in the recovery of patients with acute injuries.

CONCLUSION: Improved results of beliefs and intention of use of imagery and the use of healing imagery warrant better outcomes in the recovery of acute injuries. Thus, imagery is a very useful tool that can be used for patients suffering acute injuries.

KEY WORDS: imagery, acute injury, intention, beliefs

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INTRODUCTION

Imagery is conceptualized as 'the quasi-sensory and quasi-perceptual experiences of which we are self-consciously aware and which exist for us in the absence of those stimulus conditions that are known to produce their genuine sensory or perceptual counterparts¹. This means that imagery involves the use of all senses in the body (i.e. seeing, hearing, smelling, tasting and feeling) to experience or pre-experience an event in the mind. Based on its

role on athletes, imagery is divided into two types of imagery; cognitive and motivational². The two types of imagery operate at two levels; specific and general³. Cognitive specific is concerned with imagining skill-oriented performances, while cognitive general represents strategies and game plans related to athlete's sport⁴. Motivational specific imagery, however, is concerned with goal-oriented responses and behavior such as imagining oneself recovering from injury, whereas motivational general imagery involves the arousal and associated-performance feelings such

as relaxation and anxiety².

In the context of rehabilitation, imagery is conceptualized as mentally rehearsing the desired rehabilitation outcomes such as healing, returning to sport and executing sport skills⁵. The two types of imagery which are found to have positive effects on injuries are cognitive and motivational imageries. However, very little have been documented in the literature to suggest or acknowledge the use of imagery contents (e.g. healing imagery) in injury rehabilitation¹. In an attempt to develop a better understanding of the use of imagery, in the latter trial a model was developed for mental imagery which, as a conceptual model, was believed to help researchers see what issues had been covered with regards to the imagery use and what issues needed to be addressed in the future. Martin and his colleague's

¹ Director of Testing and Performance Enhancement, Ministry of Sports Affairs in partnership with Sultan Qaboos Sports Academy Sultanate of Oman

² Assistant Professor Physical Therapy, Principal/Director Institute of Physical Medicine and Rehabilitation, Khyber Medical University, Peshawar-Pakistan

³ Physiotherapy department Hayatabad Medical Complex, Peshawar

Address for correspondence:

Abdulhameed Al Kitani
Director of Testing and Performance Enhancement, Ministry of Sports Affairs in partnership with Sultan Qaboos Sports Academy Sultanate of Oman
Email: aalkitani@gmail.com
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model was based on Bio-informational model which proposes that imagery can activate and process the stimulus characteristics (i.e. descriptive characteristics) of an imagined event and the physiological and behavioral responses to the imaged event or situation (see figure 1).

During injury it is our beliefs and intentions which are thought to direct and manipulate the emotional responses and rehabilitation behaviors⁶. As such they are regarded as the foundation of our thoughts and cognitions⁷. This means that it is essential to assess beliefs in order to understand the value of any kind of psychological interventions. The assessment of perceptions and beliefs in the area of behavior therapy is well documented and recognized for so many years now⁸.

Understanding the healing process is essential and should one is to practice certain type of psychological skills, namely healing imagery. The three common phases of healing in acute injury are the inflammation phase, the proliferative phase and the remodeling phase⁹. Inflammation phase acts as the first body's reaction to injury involving several complex cellular activities¹⁰. Such activities are necessary to minimize the damage at cellular level. The inflammatory phase is characterized by several signs and symptoms including redness, pain and swelling which can last for up to 4 days¹¹. The proliferative phase however, involves the formation of granulation tissue and the synthesis of fibroblasts (collagen)¹². The remodeling phase is the last healing process phase that involves the regeneration and remodeling of new strong tissues with scars¹³. Despite the fact the healing process is well understood, still, the role of imagery remained unclear. Therefore, this trial was designed in order to evaluate the effects of imagery in athletes.

METHODS

Participants and selection

criteria

A total of 18 acutely injured male participants age 25.9 ± 3.6 years volunteered and completed the study. Initially 30 participants (15 from Khoula and 15 from Diwan hospitals in Oman) were supposed to take part in this study, however, due to unexpected absence on the day of appointment, number of participants decreased to 18. The participants came with knee instability (33.3%), ankle sprains (22.2%), partial Achilles tendon (11.1%), with hamstrings and quadriceps partial muscle tears (16.7% in each) and with moderate sports hernia (16.7%). All the participants had an estimated recovery period of less than 21 days since injury occurrence (18.5 ± 2.3 days). Four senior physiotherapists (two from each hospital) volunteered for this study. All participants attended at least one physiotherapy session prior to the study and were left with at least one more appointment session.

Instrument

The Sports Injury Rehabilitation Beliefs Survey (SIRBS) was adapted for this study. The SIRBS is a questionnaire which was originally designed to assess athlete's beliefs to their rehabilitation programs. In order to suit this current study, the SIRBS was modified. The amendments were first done by replacing the word "rehabilitation" into "imagery" for the questionnaire. Further amendments were made to some items of the SIRBS which were rehabilitation-oriented. For instance the word "advice" in item⁸ was changed to "strategy for using imagery", while the sentence "something discomforting" in item¹⁰ was omitted. Such changes were necessary in order to ensure that the items were imagery-oriented.

The next step was to translate the questionnaires into an Arabic language. This was done for two main reasons. Firstly, English in Oman is not the first language. Secondly, the questionnaires had techni-

cal words (e.g. imagery) which might be misinterpreted when presented in a foreign language such as Arabic for instance. Initial pilot testing which involved five Omani amateur injured players showed poor response and understanding to such items in English. Such pilot testing was very useful to support the idea of carrying out the whole study in Arabic including the presentation.

Study procedures

Ethical approval was obtained from both hospitals (Khola and Diwan). Due to the presence of participants in two different departments, the intervention was delivered twice, that is one presentation for the 12 participants at Khoula hospital and another presentation for the 6 participants at Diwan physiotherapy department. Pre-arrangements were made by contacting physiotherapists in both departments. Prior to study, all participants were introduced to the research project and its objectives. Informed consents were obtained from all participants.

Imagery session

This session took an informal style in order to promote active interaction amongst participants. The session began by showing the participants flip charts on the step by step use of imagery and had emphasized the principles of using imagery. The two main types of imagery were introduced; motivational and cognitive. The two cognitive types used in this research were "pre-experience next phase" and "healing imagery". The use of imagery content of "pre-experience next phase" was conceptualized as imagining the next phase of their physiotherapy program (e.g. moving from isometric exercises to isokinetic exercises), whereas healing imagery was imagining the physiological healing process of injury.

The practical imagery session involved only healing imagery. Participants were thoroughly introduced to the healing process of their acute in-

juries. With handouts that illustrated in pictures the three injury healing processes (i.e. inflammation, proliferation and repair), a presentation was given to participants in which a clear description of what had happened internally as a result of acute injury and the subsequent process of healing was explained to the participants. After the healing process presentation, injured footballers were given five to seven minutes in which they were asked to perform a practical session on the three healing processes.

Questionnaire distribution

The three questionnaires were given at different times of the study. First, the SIRBS imagery beliefs and intention questionnaires were given to the injured participants at pre and immediately post the presentation (i.e. intervention). Before leaving the physiotherapy departments, participants were required to take home the last questionnaire which involved the assessment of intention and adherence to imagery three weeks post the intervention. The assessment of adherence at this particular stage (3 weeks post intervention) was at the appropriate time frame.

Statistical design

Data was analyzed using Windows SPSS (Statistical Software Package Program 16.0 versions). A dependent t-test was employed in this study to check if there were differences in imagery beliefs between pre and immediately post the intervention. The dependent t-test was also used to evaluate the significance of using the healing imagery between immediately post and 3 weeks post intervention.

RESULTS

There was significant differences ($p < 0.05$) between the pre-intervention mean (84.5 ± 9.5) and immediately post-intervention (101.3 ± 11.6) for imagery beliefs. This shows that the acutely injured football-

Figure (1): The conceptual model of mental imagery use in sport (adapted from Martin et al, 1999).

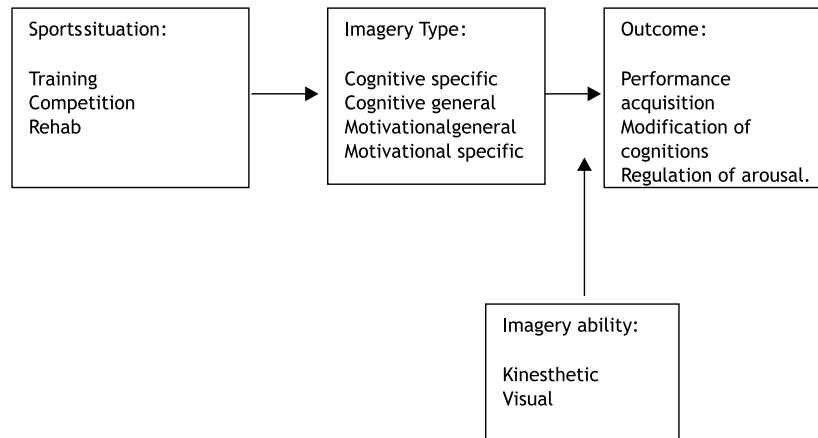
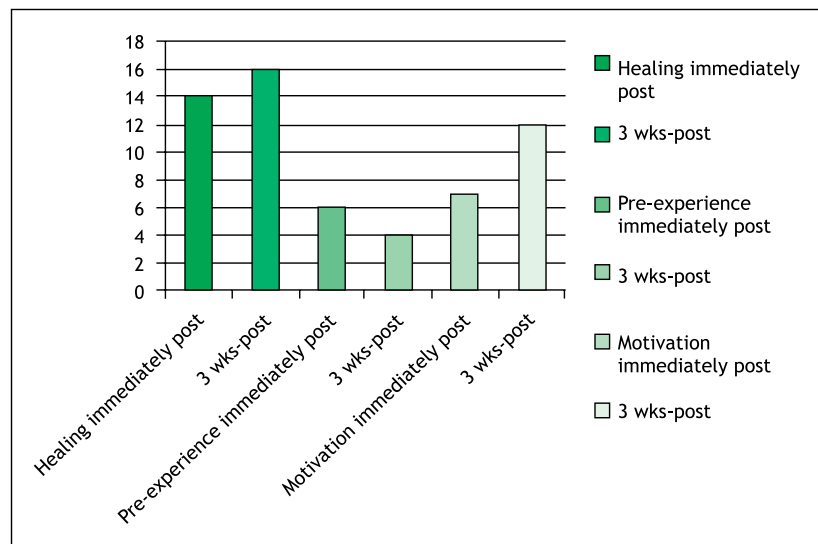


Figure 1: The types of imagery used between immediately post and 3 weeks post intervention



ers had greater beliefs in the use of imagery during injury rehabilitation following the psychological intervention. Similarly, with regards to imagery intention, a significant difference ($p < 0.05$) between the 3 weeks post-intervention for imagery intention (37.7 ± 3.2) and immediately post-intervention (36.1 ± 4.3) were observed. This indicated that the acutely injured footballers had a significant improvement in their imagery intentions 3 weeks after the interventions.

Types of imagery

The results demonstrated that the 3 weeks post-intervention for

healing imagery intention was not significantly greater than the immediately post-intervention. In contrast to the other two contents of imagery (i.e. pre-experience next phase and motivational imagery intention), motivational imagery intention had the most significant improvement between immediately post and 3 weeks post intervention. Figure 1 shows the types of imagery used between immediately post and 3 weeks post intervention.

DISCUSSION

This study predicted that the acutely injured athletes would have

greater beliefs in the use of imagery during injury rehabilitation following the psychological interventions. Similar findings were reported by Brewer et al. (1994), who gave participants a scripted exercise that demonstrated how to perform muscle relaxation, deep breathing and healing imagery, and concluded that imagery was perceived effective strategy for improving rehabilitation. However, this current study should have personalized the imagery program for each athlete. For instance, considering the fact that time gap between inflammation and repair could be less than 3 days¹¹, in the use of healing imagery some athletes might have been in the proliferative phase (2nd phase) of healing process, and thus did not need to do imagery for the first phase (inflammatory). Lamott and Petlichkoff (1990) suggested that for imagery to be effective programs should be personalized to suit the individual athlete's characteristics and circumstances.

In addition, the current study predicted that the acutely injured athletes would have a significant improvement in their imagery intentions 3 weeks after the interventions. The results demonstrated that the intention was positively maintained over time. This view is also supported by the meta-analysis by Randall and Wolff (1994) who suggested that there is an improved correlation between I-B over time (i.e. intention would be maintained better over time). However, Randall and Wolf (1994) attributed this correlation to the self-report measures used in studies. They further stated that "one might anticipate that over time studies using a self-report measure of behavior would have stronger I-B correlation than studies using objective measures of behavior.

Moreover, the current study predicted that there would be a significant improvement in healing imagery 3 weeks post-interventions. The results did not support the use of this type of imagery. However, the

results were inconsistent with the findings of Iveleva and Orlick (1991) who showed that healing imagery had the greatest relationship to recovery time amongst other imagery contents, and thus was used more by fast healers. There are several possible reasons for obtaining such insignificant results in the current study. Firstly, ideally 15 minutes is recommended for practicing the imagery skill⁷, but due to the time constraints in the study, participants were allowed to practice for only 5-7 minutes which might not have been long enough to demonstrate the effectiveness of healing imagery skill. Secondly, it is possible that the injured athletes did not view their healing process as a "skill" in the same way as they view their athletic activities. If athletes were given a handout demonstrating the phases and the likely psychological demands for each phase it would have possibly helped immensely to view the healing process as a skill.

In contrast, motivational imagery in this study had shown significant improvement between immediately post and 3 weeks post intervention compared to the healing and motivational imageries. This seems to be consistent with the study of Sorodoni et al. (2000) who found that motivational imagery was used more than cognitive imagery in enhancing injured athlete's self-efficacy and rapid return to athletic activities. With regards to the "pre-experience next phase" content, the inclusion of such content was thought to be inappropriate in this study. In such content, the injured participants were led to imagine the next phase of their physiotherapy program (e.g. moving from isometric exercises to isokinetic exercises).

CONCLUSION

Based on the finding of this trial it can be concluded that improved results of beliefs and intention of use of imagery and the use of healing imagery warrant better outcomes in

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NOTES ON CONTRIBUTORS

The study was part of MK's Bachelors in Physical Therapy Education. DAK, MIK supervised the dissertation, and was involved in every part of the analysis, idea's development, and write-up.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

ETHICS APPROVAL

The approval/permission was obtained from Khyber Medical University Research and Ethics Board.

the recovery of acute injuries. Thus, imagery is a very useful tool that can be used for patients suffering acute injuries.

REFERENCES

1. Martin KA, Moritz SE, Hall CR. Imagery use in sport: a literature review and applied model. *The sport psychologist*. 1999.
2. Paivio A. Cognitive and motivational functions of imagery in human performance. *Canadian journal of applied sport sciences Journal canadien des sciences appliquées au sport*. 1985;10(4):225-85.
3. Callow N, Hardy L. Types of imagery associated with sport confidence in netball players of varying skill levels. *Journal of Applied Sport Psychology*. 2001;13(1):1-17.
4. Munroe KJ, Giacobbi Jr PR, Hall C, Weinberg R. The four Ws of imagery use: where, when, why, and what. *The Sport Psychologist*. 2000.
5. Sorodoni C, Hall C, Forwell L. The use of imagery by athletes during injury rehabilitation. *Journal of Sport Rehabilitation*. 2000;9(4):329-38.
6. Tracey J. The emotional response to the injury and rehabilitation process. *Journal of Applied Sport Psychology*. 2003;15(4):279-93.
7. Crossman J. *Coping with sports injuries: psychological strategies for rehabilitation*. Toronto; United States: Oxford University Press; 2001.
8. Bassett SF. *The assessment of patient adherence to physiotherapy rehabilitation*. New Zealand Journal of Physio-

- therapy. 2003;31(2):60-6.
9. Broughton 2nd G, Janis JE, Attinger CE. The basic science of wound healing. *Plastic and reconstructive surgery*. 2006;117(7 Suppl):12S-34S.
 10. Anderson JM, Rodriguez A, Chang DT, editors. *Foreign body reaction to biomaterials*. *Seminars in immunology*; 2008: Elsevier.
 11. Houglum PA. Soft tissue healing and its impact on rehabilitation. *JSR*. 2010;1(1).
 12. Diegelmann RF, Evans MC. Wound healing: an overview of acute, fibrotic and delayed healing. *Front Biosci*. 2004;9(1):283-9.
 13. Frantz S, Bauersachs J, Ertl G. Post-infarct remodelling: contribution of wound healing and inflammation. *Cardiovascular research*. 2009;81(3):474-81.
 14. Brewer BW, Jeffers KE, Petipas A, Van Raalte JL. Perceptions of psychological interventions in the context of sport injury rehabilitation. *Sport Psychologist*. 1994;8:176-.
 15. La Mott E, Petlichkoff L, editors. *Psychological factors and the injured athlete: Is there a relationship*. Annual meeting of the Association for the Advancement of Applied Sport Psychology, San Antonio, TX; 1990.
 16. Randall DM, Wolff JA. The time interval in the intention-behaviour relationship: Meta-analysis. *British Journal of Social Psychology*. 1994;33(4):405-18.
 17. Ilevleva L, Orlick T. Mental links to enhanced healing: An exploratory study. *The Sport Psychologist*. 1991;5(1):25-40.