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**SPORT-RELATED INJURY: PREDICTION, PREVENTION, AND
REHABILITATION - A PSYCHOLOGICAL APPROACH**

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Ralph Maddison. Sport related injury: Prediction, prevention, and rehabilitation – A psychological approach (under the direct supervision of Dr Harry Prapavessis, Department of Sport and Exercise Science, University of Auckland).

Abstract

Two interrelated studies were performed to examine the role of psychological factors in the prediction and prevention of sport-related injury. As far as injury prediction is concerned, Study 1 tested the Williams and Andersen (1998) revised stress-injury model. It was hypothesised through the model that athletes with a history of stressors, a shortage of coping resources, and personality dispositions that augment the stress response, would be the most vulnerable to injury. Four-hundred and seventy-rugby players from 37-teams participated in the study and completed measures corresponding to variables in the Williams and Andersen stress-injury model at the beginning of the playing season. The number of injuries sustained and the amount of time loss due to injury were recorded throughout the season. Data were analysed using product moment correlations between life-stress and injury for groups of participants who fell in the upper and lower third of the moderator variables (i.e., coping resources—type of coping and social support, history of stressor—previous injury, and personality—competitive anxiety) distributions. As expected, a mild positive relationship was found between life-stress and injury time loss ($r = .09, p < .05$) and number of injuries sustained ($r = .11, p < .05$). Results also showed that previous injury, the type of coping, social support, and competitive anxiety interacted in a conjunctive fashion to produce a maximum moderator effect (explaining up to 29% of the injury variance).

A second study (Study 2) was performed to determine whether a stress management intervention programme could effectively reduce injury among athletes identified from Study 1 to be most vulnerable to injury. A second purpose was to examine what might explain a

positive result by exploring psychological (i.e., coping and anxiety) and stress response (i.e., reaction time and perceptual sensitivity) variables.

Fifty-one rugby players from Study 1 who were found to be most vulnerable to injury (i.e., a rugby player with many recent life-stresses, high competition anxiety, inappropriate coping skills, and a history of previous injury) were recruited and randomly assigned to either an intervention (stress management programme) or a control condition. Participants completed psychological inventories at the beginning (Time 1) and end (Time 2) of the 2002 rugby season. Prospective and objective injury data were obtained for both number of injuries and time loss. In addition, a purpose built apparatus was used to assess stress response variables at the beginning (Time 1) and end (Time 2) of the 2002 rugby season.

Prior to the start of the 2002 rugby season participants in the intervention group started a 6-session stress management programme that lasted 4-consecutive weeks. Emphasis was placed on how athletes could modify their reaction to stress. Participants were contacted monthly to reinforce the intervention, discuss implementation of the skills, and any relevant issues.

ANCOVA results showed a significant condition (control versus intervention) effect for total time missed, but not for number of injuries sustained. Participants in the stress management intervention reported missing less time due to injury at the end of the 2002 season compared to their non-intervention counterparts. Furthermore, the intervention group appeared to only marginally increase the amount of time missed in 2002 compared to 2001, whereas the control group missed significantly more time due to injury.

ANCOVA results provided some insight into the potential reasons for injury reduction. For the psychological variables, a significant condition effect was found for total coping resources. The intervention group showed an increase in the amount of coping resources at Time 2 compared to Time 1, and showed greater coping resources than did the control group

at Time 2. The intervention group also showed a decrease in worry at Time 2 compared to Time 1 and less worry than the control group at Time 2. The condition effect for concentration disruption (CD) approached statistical significance, with the intervention group showing less CD at Time 2 compared to the control group at Time 2. For the stress response variables no significant condition effects were found for reaction times or perceptual sensitivity (d').

Overall, results support the recommendation that a stress management programme is effective in preventing further time loss due to injury for athletes with an “at-risk” injury profile. This result in part, is due to these athletes increasing their coping skills, and decreasing their worry and concentration disruption cognitions.

In an extension of the prediction and prevention studies, a third study was conducted to examine the effectiveness of a psychological intervention (modelling) in affecting rehabilitation outcomes. Specifically the purpose of Study 3 was to investigate whether a coping modelling intervention could decrease pre-operative anxiety and perceptions of expected pain, as well as increasing rehabilitation self-efficacy and motivation associated with surgical reconstruction of the anterior cruciate ligament (ACL). A second purpose was to determine whether the modelling intervention would be associated with improved functional outcomes in the early post-operative period (6-weeks) following ACL.

Sixty-four patients undergoing arthroscopic ACL were randomised to receive a coping modelling intervention or to act as a control. Participants completed psychological inventories at different time periods during a 6-week period. In addition, the following functional outcomes were assessed, days walking with crutches, range of motion (ROM), and International Knee Documentation Committee assessment (IKDC). ANCOVA results revealed a significant condition effect for perceptions of expected pain, but not for state anxiety. Significant group differences were found for crutch self-efficacy, with the

intervention group reporting greater self-efficacy than the control group. Repeated measure ANOVA results revealed significant time x condition effects for walking self-efficacy and exercise self-efficacy. No condition effect was found for jogging self-efficacy, nor were there any condition effects found for the motivation variables. ANCOVA results showed a significant condition effect (modelling) for functional outcome improvements (IKDC scores and crutch use) with the intervention group reporting superior IKDC scores and fewer days walking with crutches. No effects were found for ROM.

Collective findings from the three studies highlight the importance of psychological factors in the prediction, prevention, and rehabilitation of athletic-related injury. Moreover, studies 2 & 3 support the use of psychological based interventions for reducing injury and augmenting traditional rehabilitation outcomes. Opportunities for future research are discussed.

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