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Literature Review

Psychosocial predictors and psychological prevention of soccer injuries: A systematic review and meta-analysis of the literature

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ABSTRACT

Objectives: To examine (a) the relationships between the psychosocial risk factors and injury rates and (b) the effects of psychological-based prevention interventions on the injury risk of soccer players.
Design: Scholarly electronic databases (PubMed/MEDLINE, Google Scholar, Scopus) were searched on 1 January 2017, complemented by manual searches of bibliographies. Setting: Systematic review and meta-analysis.
Participants: We identified 13 eligible studies, including a total of 1149 injured soccer players aged between 14 and 36 years.
Main outcome measures: Psychosocial risk factors, psychological-based prevention interventions and injury risk in soccer players.
Results: Personality traits, such as trait anxiety and perceived mastery climate, along with a history of stressors, like negative-life-event stress or high level of life stress, daily hassle, and previous injury, are the main predictors of injury rates among soccer players. Also, from injury prevention studies, it has been shown that psychological-based interventions reduce injury rates (effect size = 0.96; 95% CI 0.34−1.58; p = 0.002) in senior soccer players.
Conclusions: Practitioners need to ensure injured soccer players are psychologically and socially ready to play. They should also employ psychological-based interventions (i.e., mindfulness, imagery, self-talk, stress management, relaxation, goal setting) when designing injury prevention programs.

1. Introduction

Soccer is the most common sport in the world and has high mental and physical demands (Slimani & Nikolaidis, 2017; Slimani et al., 2016). It is one of the most complex contact sports whose frequency of practices during the season varies depending on the training phase or competing level (Kirkendall, 2011, p. 71; Scott & Anderson, 2013). Accordingly, as competitive level rises, it is a common practice for some football teams to play one or two matches per week, and take part in international tournaments, such as world championships and the Olympic Games (Slimani & Nikolaidis, 2017). These heavy schedules of practice, matches, and high psychophysical demands, lead to high risks and rates of injury in professional (Hawkins & Fuller, 1996; Hawkins, Hulse, Wilkinson, Hodson, & Gibson, 2001) and amateur players (Junge, Cheung, Edwards, & Dvorak, 2004; Kofotolis, Kellis, & Vlachopoulos, 2007). Furthermore, soccer players in an overreaching phase of training or intense competition would appear to be particularly vulnerable to injuries and psychophysical stress (Ekstrand, Hägglund, & Walden, 2011). In other words, this intensive phase

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may lead to the accumulation of stress, fatigue and its concomitants (i.e., non-functional overreaching or overtraining), and, consequently, can increase the risk of injury and illness to the athlete (Meeusen et al., 2013). For this reason, because the potential to eliminate physical stressors is limited in sport, a potential avenue for decreasing injury rates is to help players cope psychologically with stressors (Galambos, Terry, Moyle, Locke, & Lane, 2005). Previous studies suggest that psychosocial factors could affect injury risk among athletes. To provide a theoretical framework to explain the relationship between psychological variables and injury occurrence, the model of stress and athletic injury was developed (Williams & Andersen, 1998). Williams and Andersen (1998) provided a comprehensive, interactional model explaining the psychological antecedents (hardiness, sense of coherence, achievement motivation, sensation seeking, locus of control, and trait anxiety as personality traits) of sport injuries. In this model the stress response has a bidirectional relationship with the athlete's cognitive appraisals of potentially stressful situations (e.g., practice, game competition). Both the magnitude of the stress response and the athlete's appraisals of the situation may be influenced by the interplay between various psychosocial factors, which are divided into three broad categories: personality factors, history of stressors, and coping resources. Initially Andersen and Williams (1988) included hardiness, sense of coherence, achievement motivation, sensation seeking, locus of control, and trait anxiety as personality traits. Some authors have also included daily hassles, life events, and previous injuries as history of stressors (van Mechelen et al., 1996; Williams & Andersen, 1998) . Furthermore, in the model (Williams & Andersen, 1998) intervention approaches targeted to influence/buffer the stress response through psychosocial, physiological, and attentional pathways may reduce injury rates. A recent meta-analysis (Ivarsson et al., 2017) showed that including psychological training programs into other types injury prevention programs (e.g., biomechanical, strength training) within sports has the potential to reduce the risk of sport injuries and may have positive outcomes for athletes, clubs, and communities.

The aforementioned model (Williams & Andersen, 1998) and meta-analysis review (Ivarsson et al., 2017) were limited by several methodological issues. First, some psychological variables, not included in the model of stress and athletic injury (Williams & Andersen, 1998), have been found to be related to increased injury risk, such as poor visual and verbal memory, high levels of psychophysiological fatigue, behaviors related to ignorance of stressors and/or neglecting recovery (Liederbach & Compagno, 2001; Richardson, 2008; Swanik, Covassin, Stearne, & Schatz, 2007). Second, the meta-analysis review (Ivarsson et al., 2017) in this area included studies that evaluated the psychosocial predictors and the effects of prevention interventions on injury rates in different sports, limiting applicability to specific sporting contexts. Thus, more review is required in order to single out those specific psychological risk factors targeting the many different groups of athletes, such as soccer players. More specifically, for example, Johnson and Ivarsson (2011) found that increased injury risk among players in junior soccer was predicted by players having ineffective coping skills, such as worry.

In the last two decades, the effectiveness of psychological interventions on injury rate reduction has also been demonstrated (Driediger, Hall, & Callow, 2006; Edvardsson, Ivarsson, & Johnson, 2012). Some studies have shown that psychological preventive interventions, such as goal setting, positive self-talk, imagery, relaxation, mindfulness, and cognitive-behavioral biofeedback, contribute positively to the prevention of injuries, physical recovery from injury, improved self-confidence levels and the decrease of cognitive and physical anxiety (Driediger et al., 2006; Edvardsson et al., 2012; Johnson, Ekengren, & Andersen, 2005). A review of soccer-specific intervention studies will complement the focus on psychosocial risk factors in this sport and together the two aims may present a broader knowledge base on which to generate practice guidelines and identify future research needs. Therefore, attempting to extend the previous studies, the aims of the present systematic review and meta-analysis were to examine (1) the psychosocial risk factors of soccer injuries and (2) the effects of psychological prevention interventions on the injury risk in soccer players.

2. Materials and methods

2.1. Search strategy

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Statement guidelines (Moher, Liberati, Tetzlaff, & Altman, 2009, Fig. 1). Scholarly electronic databases (PubMed/MEDLINE, Google Scholar, Scopus) were searched from inception up to 1st January 2017. Moreover, we performed manual searches of relevant journals and reference lists obtained from published articles. Electronic databases were searched using the following keywords: “soccer” in combination with the terms “psychosocial predictors”, “stress”, “anxiety”, “risk factors”, “history of stressors”, “personality traits”, “coping”, “psychological prevention”, and “injuries”.

2.2. Inclusion and exclusion criteria

To be suitable for inclusion, studies had to fulfill the following selection criteria: (a) studies examined either the relationships between the psychosocial risk factors (e.g., stress response, history of stressors, coping, and personality traits) and injury rates among soccer players or investigations studied the effects of psychological prevention interventions on injury rates; (b) studies recruiting male or female soccer players and at any age category and any level as participants and (c) original studies written in English. Reviews, comments, interviews, letters, posters, book chapters, and books were excluded.

2.3. Data extraction

Two authors independently extracted data (participant details, intervention details, outcome measures, and main conclusions), using an *ad hoc* structured form. We resolved discrepancies by referring to the original papers and through discussion.

2.4. Procedure and data analysis

Once the database of papers had been finalised, we followed procedures described by Edwards, Tod, and Molnar (2014) and Sallis, Prochaska, and Taylor (2000) to analyse the content. Each study was listed first by year, and then alphabetically according to first author within each year. Papers meeting the inclusion criteria are indicated in the reference list at the end of this manuscript with an “*”. The data tables were then analysed to create summary tables presented in the results section of this article, the creation of which involved a number of stages. First, the relationships the injury rates had with other variables were examined. Second, the effects of psychological-based prevention interventions on the injury risk in soccer players were also examined.

For each variable, the number of studies and observations and percentage of these observations in which the variable's relationship with the injury rates was positive (+), negative (−) or insignificant (0) are presented. Consistent with Sallis et al. (2000) and other systematic reviews (e.g. Edwards et al., 2014), the ‘summary code’ column reflects the consistency with which each variable