



Original research

Extending in-competition Athletics injury and illness surveillance with pre-participation risk factor screening: A pilot study



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ABSTRACT

Objectives: To explore the performance of retrospective health data collected from athletes before Athletics championships for the analysis of risk factors for in-competition injury and illness (I&I).

Methods: For the 2013 European Athletics Indoor Championships, a self-report questionnaire (PHQ) was developed to record the health status of 127 athletes during the 4 weeks prior to the championship. Physician-based surveillance of in-competition I&I among all 577 athletes registered to compete was pursued during the championships.

Results: 74 athletes (58.3%) from the sample submitted a complete PHQ. 21 (28%) of these athletes sustained at least one injury and/or illness during the championships. Training more than 12 h/week predisposed for sustaining an in-competition injury, and a recent health problem for in-competition illness. Among the 577 registered athletes, 60 injuries (104/1000 registered athletes) were reported. 31% of injuries were caused by the track, and 29% by overuse. 29 illnesses were reported (50/1000 registered athletes); upper respiratory tract infection and gastro-enteritis/diarrhoea were the most reported diagnoses.

Conclusions: Pre-participation screening using athletes' self-report PHQ showed promising results with regard to identification of individuals at risk. Indoor injury types could be attributed to extrinsic factors, such as small track size, track inclination, and race tactics.

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1. Introduction

The European Athletics (EAA), the International Association of Athletics Federations (IAAF) and the International Olympic Committee (IOC) have an ethical obligation to protect athletes' health (Alonso, Edouard, Fischetto, Adams, Depiesse, & Mountjoy, 2012; Edouard, Branco, & Alonso, 2014; Edouard, Depiesse, Branco, &

Alonso, 2013; Edouard, Depiesse, Hertert, Branco, & Alonso, 2013; Junge et al., 2008; Ljungqvist et al., 2009). As the first step in the sequence of prevention (van Mechelen, Hlobil, & Kemper, 1992), epidemiological injury and illness (I&I) surveillance studies during elite international outdoor Athletics championships have reported that 10–14% of athletes sustain an injury and 7% develop an illness (Alonso, Junge, Renstrom, Engebretsen, Mountjoy, & Dvorak, 2009; Alonso, Tscholl, Engebretsen, Mountjoy, Dvorak, & Junge, 2010; Alonso et al., 2012; Edouard, Depiesse, Branco, et al., 2013; Feddermann, Junge, Edouard, & Alonso, 2014). Lower incidences have been observed during indoor championships (5–8% for injuries and 3% for illnesses) (Edouard, Depiesse, Hertert, et al., 2013;

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Feddermann et al., 2014). However, these latter results must be interpreted with caution due to the low number of covered athletes (Edouard, Depiesse, Hertert, et al., 2013; Feddermann et al., 2014).

For the second step in the sequence of prevention, the current I&I surveillance system has to be improved by collecting pre-participation data on risk factors. In football (soccer), a pre-competition medical assessment (PCMA) is performed by team physicians during the three months before the FIFA championships to identify players at risk of injuries or cardiac problems (Dvorak, Grimm, Schmied, & Junge, 2009; Dvorak, Grimm, Schmied, & Junge, 2012). In an effort to adapt pre-participation screening methods to the heterogeneity of Athletics (Edouard et al., 2014; Jacobsson, Timpka, Ekberg, Kowalski, Nilsson, & Renstrom, 2010), we hypothesised that self-reporting of an athlete's training practices and health status in the month preceding the championships using a pre-participation health questionnaire (PHQ) would be more relevant.

Thus, the aim of this study was to explore the performance of retrospective health data collected from athletes before Athletics championships in the analysis of risk factors for in-competition I&I. The incidence and characteristics of I&I sustained during the championship were analysed as a baseline.

2. Methods

2.1. Study design and data collection procedures

The study was performed during the European Athletics Indoor Championships (28 February to 3 March 2013) held at Göteborg, Sweden. It used a nested cohort design involving a sub-cohort of athletes ($n = 127$) invited to participate in a pilot study of pre-participation risk factors and an I&I surveillance study involving the total cohort of athletes registered at the event ($n = 577$).

- 1) Pre-participation risk factor study: This part of the study was based on a sub-cohort of athletes belonging to 6 national teams whose team physicians accepted to inform and actively encourage their athletes to return a pre-participation health questionnaire (PHQ). At the start of the championships, these athletes were asked to provide individual pre-participation information (personal, training, and health status during the month preceding the championships) using a PHQ (Fig. 1). All new I&I during the championships were recorded using the I&I surveillance system. The athletes' gender, date of birth and nationality were used to combine pre-participation and I&I surveillance data.
- 2) I&I surveillance study: The recording of all new I&I occurring during the championships among all the athletes registered (total cohort of athletes) was made by national medical teams (physicians and/or physiotherapists) and/or by the local organising committee (LOC) following the methodology previously used during international Athletics championships for more information about implementation, definitions and report forms see previous publications (Alonso et al., 2009, 2010, 2012; Edouard, Depiesse, Branco, et al., 2013; Edouard, Depiesse, Hertert, et al., 2013; Junge et al., 2008).

All the national medical teams and LOC were informed about the study two months before the championships by e-mail, and the day before the championships during an instructional meeting.

2.2. Definitions

A “pre-participation health problem” was for the present study defined as any pain, injury and/or illness reported by an athlete to

have occurred during the month prior to the championships. A “new health problem” was any new injury and/or new illness recorded by their national medical team and/or LOC during the championships.

2.3. Development of the pre-participation health questionnaire

The PHQ was developed by a group of experts consisting of scientists and practitioners ($n = 9$) with backgrounds in sports medicine and physiotherapy, epidemiology, biostatistics and Athletics coaching. The PHQ was developed to collect relevant information directly from the athletes regarding their morphological status, training conditions, and pre-competition I&I (Alonso et al., 2012; Edouard, Depiesse, Branco, et al., 2013). The overall goal was to identify possible in-championship I&I risk factors by comparing data from this questionnaire with those from I&I surveillance. In practice, the questionnaire needed to be easy to understand and quick to complete, enabling its use during major championships with a maximum response rate.

During telephone meetings, the authors developed a list of questions based on previous findings from Athletics studies (Alonso et al., 2012; Edouard, Depiesse, Branco, et al., 2013; Edouard, Depiesse, Hertert, et al., 2013; Jacobsson et al., 2013) regarding the athlete's characteristics (gender, age, country, height, weight, discipline, time spent in training) and health status (fatigue, pain, injury and illness). It was agreed that the health status part of the questionnaire should focus only on the month immediately preceding the championships, as this would avoid recall bias. Self-reported data were chosen because such athletes are not always regularly followed-up by official or team physicians, and also because this would better reflect the heterogeneous nature of Athletics disciplines (Jacobsson et al., 2010). The questions were formulated in line with a questionnaire used for monitoring over-use sports injuries, especially regarding the term “problem” (Clarsen, Myklebust, & Bahr, 2013).

The PHQ was deliberately designed to be short in order to improve the response rate. The design of the documentation form also aimed at simplicity, clearness, and data accuracy. Checkboxes were used, and spaces for free text were provided for describing the diagnosis with the help of the tutorial and team physicians, if needed. Iterative corrections/comments were made by e-mail correspondence between the authors until there were no further changes. After the final iteration, all authors were asked to confirm their agreement with the final PHQ. The PHQ was created in English but also translated into Spanish and French by native speakers (JMA, PE). The PHQ (Fig. 1) was given to athletes in paper format either in their welcome bag or by their team physicians. They were asked to complete the questionnaire either alone or with help of their team physicians if necessary, and to return it to their team physician or the designated desk at the warm-up area.

2.4. Confidentiality and ethical approval

The athletes' gender, date of birth and nationality were used only to avoid duplicate reporting from team and LOC physicians and to link I&I surveillance data to that collected during the pre-participation survey. The athletes were informed of the purpose and procedures of the study via an information letter in their welcome bags. All athletes were free to refuse that their data be used. All I&I reports were stored in a locked filing cabinet and were rendered anonymous after the championships. Confidentiality of all information was ensured so that no individual athlete or national team could be identified. Ethical approval was obtained from the Saint-Etienne University-Hospital Ethical Committee (Institutional Review Board Information: IORG0004981).

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