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CAN WE PREVENT INJURIES IN RECREATIONAL RUNNERS? A RANDOMIZED CONTROLLED TRIAL

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Background The INSPIRE trial examined in 2017 the effect of an online injury prevention program on the number of running-related injuries (RRI). Although this program showed no effect on the number of injuries, new insights from this study were used to design an enhanced prevention program.

Objective To examine the effectiveness of an online injury prevention program on the number of RRIs in recreational runners.

Design Randomized controlled trial.

Setting This study includes analyses of a randomized controlled trial on RRI prevention in recreational runners registered for a Dutch running event (distances 10–42.195 km).

Participants 4105 adult, recreational runners who registered at least two months before the running event and did not participate in the INSPIRE trial.

Interventions Participants that were randomized into the intervention group were given access to the online '10 steps 2 outrun injuries' prevention program, which included 10 steps with advice to prevent RRIs. Participants received three follow-up questionnaires: one month and one week before the registered running event and one month after the running event.

Main Outcome Measurements The number of new RRIs in the intervention and control group during follow-up. Secondary outcome measures included the injury proportions in participants per injury location and in participants with an RRI in the 12 months before baseline.

Results During follow-up, 35.5% (95% CI 33.5;37.6) of the participants in the intervention group sustained a new RRI compared to 35.4% (95% CI 33.3;37.5) of the participants in the control group, with no differences between groups (OR 1.03; 95% CI 0.90;1.17). No significant differences in injury proportions were found in participants per injury location and in participants with an RRI in the 12 months before baseline.

Conclusions An enhanced online injury prevention program including 10 steps to outrun injuries had no effect on the number of RRIs in recreational runners.

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IMPACT ASYMMETRY AMONG RECREATIONAL RUNNERS: EFFECTS OF SEX, SPEED, AND FOOTWEAR

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Background Comparison of between-limb loading asymmetry during running is often used to assess injury risk or return to run criteria. With the increased use of inertial measurement units (IMUs) in clinical and consumer contexts, it is important to determine normative values for impact asymmetry. For some metrics, such as strength, asymmetries of less than 10% are considered normal, but normal values of impact asymmetries and whether they vary depending on the runner's sex, running speed, or footwear is unknown.

Objective The purpose of this investigation was to describe the magnitude of asymmetries of peak positive vertical accelerations (PPA) during running among healthy runners and to determine the influence of sex, speed, and footwear.

Design Cross-sectional.

Setting Lab-based.

Patients (or Participants) Healthy recreational runners.

Interventions (or Assessment of Risk Factors) Healthy runners between the ages of 18 and 60 ran in standardized footwear (minimalist, maximalist, and neutral) at three speeds (self-selected, +10%, -10%) while an insole-embedded IMU collected acceleration data at 500 Hz.

Main Outcome Measurements Asymmetries were calculated for PPA. A univariate ANOVA with mixed effects assessed the influence of sex, speed, and footwear.

Results Seventeen runners (8 female) were included. The mean asymmetry across all trials was $16.0 \pm 23.5\%$, with an SEM of 2.6%. No significant interactions occurred with footwear or speed, but there was a significant difference between sexes (13.1%; $p = .013$). However, the effect sizes were very small based on Z-score comparison ($-0.325 \leq z \leq 0.232$) and unlikely to be meaningful.

Conclusions The magnitude of asymmetry varies considerably across individuals, but does not seem to be substantially affected by sex, speed, or footwear. Future studies should include a larger sample size and detailed running history variables in an effort to determine population norms and effect of training- and injury-related variables on impact asymmetry.

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LONG-TERM MEDICAL CONDITIONS (LTMCS) IN MARATHON PARTICIPANTS

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Background The average age of participants in mass-participation community-based endurance running events is slowly increasing. The prevalence of long-term medical conditions in marathon participants can inform medical planning for such events.

Objective To describe the prevalence of long-term medical conditions (LTMCS), including cardiovascular disease (CVD) risk factors, in participants of mass-participation community-based marathon events.

Design Observational questionnaire-based study.

Setting Two large UK city mass-participation marathon events.

Patients (or Participants) Entry to both events was open to novice runners, with no qualifying time for general entry. All registered participants were invited to complete an online questionnaire in the week preceding the event. 11809 runners completed the survey.

Interventions (or Assessment of Risk Factors) Demographics including age, gender, medical history, medication and smoking.

Results The average age of respondents was 40.9y (range 18–83y) and 54.1% were male. 42.3% of respondents had never completed a marathon event before. 1995 (16.9%) of all respondents had a LTMC. Most (95.7%) were aware of their condition prior to entering but only 47.0% had seen a doctor about their health with respect to the event. Respiratory conditions such as asthma were the most common LTMC (36.2%). 363 (18.2%) of LTMCs were related to a cardiovascular cause (hypertension, hypercholesterolaemia, previous myocardial infarction or angina, previous stroke/TIA or Type 2 diabetes mellitus). 35.1% were current or ex-smokers. 72.0% of those with aLTMC were taking prescribed medication (compared to 11.2% of those without a LTMC).

Conclusions In this study on runners in mass-participation community-based marathon events, approximately 1 in 6 respondents had a long-term medical condition. Further study will improve our ability to counsel individuals who wish to participate in endurance running events and help event organisers and medical teams to plan for reasonably anticipated medical conditions.

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RECREATIONAL RUNNERS' ATTITUDES TOWARDS RUNNING-RELATED INJURY PREVENTION, SELF-MANAGEMENT AND THE USE OF DIGITAL TECHNOLOGY TO PREVENT AND SELF-MANAGE INJURY

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Background Recreational runners have a high prevalence of running-related injury (RRI). Injury prevention and self-management of RRIs using digital technologies may be a way to enable continued participation and maintain positive health benefits.

Objective To explore attitudes of recreational runners towards prevention and self-management of RRI, including barriers and facilitators to digital methods supporting RRI prevention and self-management.

Design A qualitative design was conducted and data saturation achieved through five online focus groups conducted via Zoom.

Setting Recreational running community in Wales.

Patients (or Participants) 20 recreational runners aged 18+, distributed across 5 focus groups. All participants were selected from a subset of 233 runners who had participated in a survey mapping training and injury patterns in this population.

Assessment of Risk Factors All participants advised regarding protection of anonymity and confidentiality of information shared during focus groups. Transcripts were given to selected participants to ensure trustworthiness

Main Outcome Measurements Data were coded, organized into sub-themes and thematically analysed.

Results Recreational runners reported to prevent and self-manage injury using a range of means (e.g. stretches, massage, strength training and cross training). Runners sourced information from the internet, physiotherapists, running peers and

coaches. Participants found online information overwhelming, expressing distrust in the information. Facilitators for use of digital platforms were the information evidence base, its trustworthiness and the ability to personalise the programme according to characteristics such as age, gender and injury history. Other factors potentially enhancing its uptake were simplicity, ease of use, accessibility and content (e.g. information on warm-ups, specific RRIs and examples of exercises for prevention and management).

Conclusions Recreational runners find online information about RRI prevention and self-management to be overwhelming, confusing and unreliable. Any future digital RRI prevention and self-management programmes should be simple to use while also providing evidence-based, reliable information and advice.

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THE BALANCE ERROR SCORING SYSTEM: FAILURE TO DETECT PREVIOUS ANKLE INJURY OR INSTABILITY IN YOUTH ATHLETES

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Background Prevalence of lateral ankle sprains (LAS) is high among adolescent athletes resulting in time loss from sport and, often, long term functional ankle instability (FAI): a major risk factor for re-injury.

Objective This study aimed to assess the sensitivity of the Balance Error Scoring System (BESS) to detect FAI in adolescent athletes.

Design Case control study.

Setting Youth sport in an UK independent school

Participants Twenty-seven athletes who had sustained a past ankle injury took part. Selection criteria included participant involvement in the school athletic development programme.

Assessment of Risk Factors A modified BESS protocol was used. Participants balanced on one leg for 20 seconds on a stable surface (the ground) followed by an unstable surface (Airex balance pad), keeping their eyes closed and hands on hips. Both ankles were tested across each surface.

Main Outcome Measurements Participants received an error score for each condition (capped at 10 errors). Errors included: opening eyes, moving hands off hips, lifting toes or heel up, abduction or flexion at the hip $>30^\circ$ and stepping, stumbling, or falling.

Results There was no significant difference in error score between the ankle that had previously been injured and that which had not on a stable ($p=1.0$) and unstable ($p=0.46$) surface. On the unstable surface, the error score (mean \pm standard deviation) was 7.5 ± 1.8 for athletes with a previous ankle injury and 7.8 ± 1.4 for athletes without a previous ankle injury. On the stable surface, the error score (mean \pm standard deviation) was 3.2 ± 2.3 for athletes with a previous ankle injury and 3.2 ± 2.3 for athletes without a previous ankle injury.

Conclusions The BESS was not able to detect previous ankle injury or FAI in adolescent athletes. Using the BESS in conjunction with other assessment tools may allow practitioners to screen for more ankle injury risk factors.