

**Main Outcome Measures** Independent risk factors associated with all MEs (both injury- and illness-related) using race day factors and individual self-reported medical history (allergies and medical conditions/medication use) were investigated using a multivariate model with a Poisson distribution, reporting the prevalence ratio (PR: 95% CI).

**Results** Over 5 years 1 749 medical encounters were recorded. Independent risk factors associated with all MEs were: older females (males 31–40 years vs females >50 years, 0.6: 0.4–0.8,  $p=0.0017$ ; males 41–50 years vs females >50 years, 0.5: 0.4–0.7,  $p=0.0002$ ; males >50 years vs females >50 years, 0.6: 0.4–0.8,  $p=0.0008$ ), slower race pace (7–<8 min/km vs 8–<9 min/km, 0.8: 0.7–0.9;  $p=0.0044$ ) and self-reported medical conditions/medication use (no history vs. medical condition/medication use, 0.7: 0.6–0.9;  $p=0.0082$ ).

**Conclusion** A self-reported history of a medical condition/medication, older females, and slower runners were risk factors associated with MEs during/immediately after the 90km Comrades ultramarathon. These data support initiatives to introduce pre-race medical screening, which could then form the basis for the design and implementation of prevention programs to manage risk of MEs at these events.

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**METABOLIC/ENDOCRINE DISEASE, OLDER FEMALES, LONGER RACE DISTANCE, SLOWER RACE PACE AND HIGHER WBGT ARE INDEPENDENT RISK FACTORS ASSOCIATED WITH MEDICAL ENCOUNTERS IN 21.1 KM AND 56 KM RUNNERS: A SAFER STUDY IN 76654 STARTERS**

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**Background** Recent data indicate that pre-race medical screening and education can reduce medical encounters (MEs) at an endurance running event. However, the relationship between the risk of MEs and specific risk factors from pre-race medical screening, together with race day factors, and has not been explored.

**Objective** To determine the independent risk factors that are associated with MEs during distance running events, using data from pre-race medical screening and race day.

**Design** Prospective study, with cross-sectional analyses.

**Setting** 2012–2015 Two Oceans marathon races (21.1km, 56km), South Africa.

**Patients (or Participants)** 76654 consenting race entrants.

**Interventions (or Assessment of Risk Factors)** All entrants completed a pre-race medical screening questionnaire upon entry, coupled with an educational intervention, as per their responses to questions. Race day data were collected from the race organisers and all MEs were recorded by medical staff on race day.

**Main Outcome Measurements** Risk factors associated with ME (both injury- and illness-related) were investigated

using a multiple regression model with a Poisson distribution (reporting the prevalence ratio - PR: 95% CI) that included: demographics (age, sex), race day data [wet-bulb globe temperature (WBGT), race distance (21.1km or 56km), race pace], and individual pre-race medical screening data.

**Results** Independent risk factors associated with MEs were: history of metabolic disease (2.1: 1.3–3.3;  $p=0.0030$ ), older females (>55 years) (2.5: 1.6–4.1;  $p=0.0002$ ), longer race distance (56km vs. 21.1km, 1.9: 1.5–2.4;  $p<0.0001$ ), slower race pace (increase of 1min/km, 1.2: 1.1–1.3;  $p=0.0029$ ), and higher WBGT ( $p=0.0264$ ).

**Conclusions** Metabolic/endocrine disease, older females, longer race distance, slower race pace and higher WBGT were independent risk factors for MEs in distance running events. In addition to environmental factors, these data support initiatives to obtain pre-race medical screening, demographic, and running pace data in order to design and implement ME prevention programs at distance running events.

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**SLOWER RUNNERS, OLDER FEMALES AND ROUTE CHARACTERISTICS ARE INDEPENDENT RISK FACTORS FOR SERIOUS/LIFE-THREATENING MEDICAL ENCOUNTERS IN A 90 KM ULTRAMARATHON: A SAFER STUDY IN 70328 RUNNERS OVER 5 YEARS**

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**Background** Serious/life-threatening medical encounters (sltMEs) occur during mass community-based events, with higher incidences in ultra-endurance events. Risk factors associated with sltMEs are under-investigated.

**Objective** To determine independent risk factors for serious/life-threatening MEs in a 90 km ultramarathon running event.

**Design** Retrospective clinical audit, cross-sectional analysis

**Setting** 2014–2018 Comrades ultramarathon (90km, alternating annually between an ‘up’ vs. a ‘down’ run between a coastal and inland city), South Africa

**Participants** 70328 race starters

**Interventions** All entrants voluntarily completed two medically-related questions: 1) history of allergies, and 2) history of any medical condition and/or medication use. Race day data (start time, finish time, age, sex, ‘up’ vs. ‘down’ run) was recorded by the race organisers; and sltMEs (as defined in the 2019 consensus statement on mass community-based events) were recorded by race medical staff during and immediately after the event.

**Main Outcome Measures** Independent risk factors associated with sltMEs (injury- and illness-related) using demographics (age, sex), race day factors (route ‘up’ or ‘down’; race pace), and individual self-reported medical history (allergies, medical conditions/medication use) were investigated using a multivariate model with a Poisson distribution, reporting the prevalence ratio (PR: 95% CI).

**Results** 159 serious/life-threatening medical encounters were recorded over the 5 years. The following independent risk factors were associated with serious/life-threatening medical encounters: age and sex (males 31–40 yrs vs females >50 yrs, 0.3: 0.1–0.7,  $p=0.0076$ ; males 41–50 yrs vs females >50 yrs,

0.2: 0.1–0.4,  $p=0.0002$ ; males >50 yrs vs females >50 yrs, 0.4: 0.2–0.9,  $p=0.0323$ ), running pace (6-<7 min/km vs 8-<9 min/km, 0.4: 0.2–0.8,  $p=0.0062$ ; 7-<8 min/km vs 8-<9 min/km, 0.5: 0.3–0.9,  $p=0.0299$ ) and route (up vs. down, 0.5: 0.3–0.8,  $p=0.0046$ ).

**Conclusion** Older females, slower runners and route (down run) were independent factors associated with higher risk of serious/life-threatening MEs in a 90 km ultramarathon. These data will form the basis to design and implement prevention programs to manage risk of sltMEs at these events.

### 072 PROMOTION OF PARA ATHLETE WELL-BEING IN SOUTH AFRICA (THE PROPEL STUDIES), PART I: PROFILES AND PREVALENCE OF PSYCHOLOGICAL DISTRESS

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**Background** There is a paucity of research investigating the mental health profiles of para athletes globally, especially in South Africa.

**Objective** To describe the mental health profiles of a representative sample of para athletes in South Africa.

**Design** Descriptive, cross-sectional survey.

**Setting** National to international level athletes competing in the 2019 National Championships for athletes with impairments.

**Patients (or Participants)** A total of 124 athletes (93 males; 31 females) with a mean age 26.7 ( $\pm 9.2$ ).

**Interventions (or Assessment of Risk Factors)** Between-group differences were analysed using the Mann-Whitney U test or one-way ANOVA. On completion of the questionnaires, all athletes were given information about mental health support services.

**Main Outcome Measurements** Mental health was measured with the Trait component of the State/Trait Anxiety Inventory (STAI) and the Kessler Psychological Distress Scale (K-10).

**Results** The mean score for the STAI was 39.2 ( $\pm 9.3$ ) units. A quarter (25%) of all athletes scored 45 and above, in line with scores of patients with a psychological/psychiatric diagnosis. On average, females ( $35.9 \pm 8.7$ ) had better STAI scores than males ( $40.3 \pm 9.3$ ;  $p=0.02$ ) and married ( $32.6 \pm 8.9$ ) athletes had better scores than single ( $40.2 \pm 8.9$ ;  $p=0.002$ ) athletes. The mean K-10 questionnaire score was 20.4 ( $\pm 6.4$ ) units, with no gender difference. However, K-10 scores were significantly higher in single than in married athletes ( $U = 415.5$ ;  $p = 0.002$ ). Using a cut-off score of  $\geq 28$  and  $\geq 16$  on the K-10, 12.2% and 76.4% of athletes had symptoms of distress, respectively. Neither scale was associated with level of competition, sport code or impairment type. The K-10 and STAI scores were highly correlated ( $r_s=0.64$ ,  $p<0.001$ ).

**Conclusions** The study found high rates of psychological distress among para athletes, which is an important first step towards the development of prevention strategies. There is a need to further understand and identify mechanisms affecting mental health in this population.

### 073 PROMOTION OF PARA ATHLETE WELL-BEING IN SOUTH AFRICA (THE PROPEL STUDIES), PART II: IDENTIFICATION OF SLEEP-ASSOCIATED RISK FACTORS

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**Background** Good sleeping habits are necessary for optimal practice and performance, as well as for athlete health. Although the sleep characteristics of elite athletes are well described, research is limited on the sleep profile of similar-level para athletes.

**Objective** To evaluate sleep quality, sleepiness and chronotype of para athletes in South Africa.

**Design** Descriptive, cross-sectional survey.

**Setting** National to international level para athletes competing in the 2019 National Championships.

**Patients (or Participants)** A total of 124 athletes (93 males; 31 females) with a mean age 26.7 ( $\pm 9.2$ ).

**Interventions (or Assessment of Risk Factors)** Chi-square, with Fisher's exact tests were used to evaluate differences in sleep latency, efficiency, daytime dysfunction, sleep duration, chronotype and sleepiness between 'good' and 'poor' quality sleep groups.

**Main Outcome Measurements** Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness scale and Morningness-Eveningness Questionnaire (MEQ-SA).

**Results** Fifty-eight percent (58%) of athletes identified as morning types, while 38% identified as intermediate types. Forty-eight percent (48%) were classified as having 'good' and the remainder as having 'poor' sleep quality. Moderate to severe daytime sleepiness was present in 30% of athletes. Thirty percent (30%) reported sleep duration of 5–6 hours per night, while 5% slept less than 5 hours. Morning types were significantly associated with the 'good' quality sleep group ( $p<0.001$ ,  $V=0.35$ ) and the 'sleepiness' group were associated with the 'poor' quality sleep group ( $p=0.04$ ,  $V=0.19$ ). Additionally, athletes with 'poor' sleep quality were associated with shorter sleep duration ( $p<0.001$ ,  $V=.63$ ), greater sleep latency ( $p<0.001$ ,  $V=.62$ ), lower sleep efficiency ( $p=0.001$ ,  $V=.45$ ), greater daytime dysfunction ( $p<0.001$ ,  $V=.40$ ) and greater sleep disturbances ( $p<0.001$ ,  $V.34$ ).

**Conclusions** The majority of athletes in this study presented with poor sleep quality. These findings demonstrate a need to identify, address and prevent possible mechanisms affecting poor sleep quality in this population.

### 074 PROMOTION OF PARA ATHLETE WELL-BEING IN SOUTH AFRICA (THE PROPEL STUDIES), PART III: FACTORS ASSOCIATED WITH MENTAL HEALTH

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