

diabetes mellitus).

**Discussion:** Being female and alcohol consumption appeared to be key predictors of having a chronic condition in MA, and MA had a lower prevalence of most chronic conditions compared to the general population. This study highlights key factors influencing the health of MA as well as the potential health benefits of regular exercise and participation in sport for older adults.

**Conflict of interest statement:** My co-authors and I acknowledge we have no conflict of interest to the submission of this abstract.

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## S58

### **Pelvic floor symptoms are an overlooked barrier to exercise participation: a survey of 4556 symptomatic women**

J. Cook<sup>b</sup>, J. Dakic<sup>a</sup>, C. Ekegren<sup>a</sup>, H. Frawley<sup>e</sup>, J. Hay-Smith<sup>c</sup>, K. Lin<sup>d</sup>

<sup>a</sup>Monash University, Australia

<sup>b</sup>LaTrobe University, Australia

<sup>c</sup>University of Otago, New Zealand

<sup>d</sup>National Cheng Kung University, Taiwan

<sup>e</sup>The University of Melbourne, Australia

**Introduction:** Physical inactivity is the second highest contributor to chronic disease and injury in Australian women. Pelvic floor (PF) disorders are highly prevalent; 25% of women in the general population report symptoms. This study aimed to (i) investigate barriers to exercise in women with PF symptoms (urinary incontinence [UI], anal incontinence [AI] and pelvic organ prolapse [POP]) (ii) determine factors associated with reporting PF symptoms as a substantial exercise barrier and (iii) investigate the association between reporting PF symptoms as an exercise barrier and physical inactivity.

**Methods:** Australian women, 18-65 years with PF symptoms (n=4556), completed a survey containing validated PF and physical activity questionnaires. Participants reported exercise barriers and the degree they limited participation. Binary logistic regression was used to identify variables associated with (a) identifying PF symptoms as a substantial exercise barrier (stops exercise participation often/all of the time) and (b) physical inactivity.

**Results:** In this cohort, 31% (n=1429) reported PF symptoms as a substantial exercise barrier, UI was the most frequently reported barrier. Two-thirds of participants who identified POP and UI as exercise barriers, had stopped exercising. The odds of reporting PF symptoms as a substantial exercise barrier were significantly higher for women with severe UI (odd ratio (OR):4.77 CI:3.60, 6.34), high symptom bother (UI OR:10.19, CI:7.24, 14.37; POP OR:22.38, CI:13.04, 36.60; AI OR:29.66, CI:7.21,122.07), those who experienced vaginal birth (one birth OR:2.04, CI:1.63, 2.56) or a 3rd/4th degree obstetric tear (OR:1.47, CI:1.24, 1.76). The odds of being physically inactive were greater in women who identified PF symptoms as an exercise barrier than those who did not (OR:1.33, CI:1.1, 1.59).

**Discussion:** A high prevalence of PF symptoms in women has been previously established. This study demonstrated that PF symptoms are a substantial barrier to exercise participation, causing one in three symptomatic women to stop participation in exercise often/all the time. Physical inactivity is a major cause of mortality and morbidity in Australian women. Pelvic floor symptoms stop women of all ages from participating in exercise, including younger nulliparous women. Those who identify their PF symptoms as a substantial barrier to exercise have higher odds of being physically inactive. Pelvic floor muscle training has level 1A evidence as an effective, low-risk form of conservative management for UI symptoms in the general population. Identification and management of PF symptoms could allow women to remain physically active across their lifespan.

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## S62

### **A comparison of acceleration and maximum speed sprint training on eccentric hamstring strength and hamstring muscle architecture**

B. Freeman<sup>a</sup>, L. James<sup>b</sup>, D. Opar<sup>c</sup>, S. Tapley<sup>a</sup>, W. Young<sup>a</sup>

<sup>a</sup>Federation University Australia, Australia

<sup>b</sup>La Trobe University, Australia

<sup>c</sup>Australian Catholic University, Australia

**Background:** Hamstring strain injuries (HSI) are prevalent in field sports with a high-speed running component. It is widely believed that sprint training can have a HSI preventative effect due to the relatively high muscle activation. However, it is not known whether acceleration or maximum speed training is more effective for influencing HSI risk indicators such as eccentric strength or fascicle length. Therefore, the purpose was to investigate the differences between acceleration and maximum speed sprint training on eccentric hamstring strength and BFLH architecture.

**Methods:** Community footballers (age = 23.1 ± 3.8, n = 12) were recruited for six-weeks of acceleration or maximum speed sprint training. Athletes completed pre- and post-testing consisting of a 40-m sprint test with 0-10-m and 30-40-m splits, an eccentric hamstring assessment on the NordBord, and an ultrasound assessment of the BFLH. Athletes were ranked on eccentric hamstring strength then separated into three groups: acceleration (n = 4), maximum speed (n = 4) and control (n = 4). Sample size was limited due to COVID-19 restrictions. Acceleration and maximum speed training was completed twice weekly. Ultrasound assessment was performed 24-hours post-session 2, 4, 6, 8, 10 and, 12. Athletes were asked to rate their soreness on a Likert scale 24-hours post-session.

**Results:** Mean eccentric hamstring strength improved in the acceleration (5.3%, d = 0.27) and maximum speed (3.5%, d = 0.31) groups, however, not in the control (0.9%, d = 0.09) group. Acceleration (+23%, d = 1.59) and maximum speed (+20%, d = 1.81) athletes increased BFLH fascicle length compared to control athletes (-6%, d = -0.31). Acceleration improved by 2% and 3% for the acceleration and maximum speed athletes respectively. Likewise, maximum speed improved by 11% and 8% for the acceleration and maximum speed athletes. Control athletes performed 2% worse in acceleration and 1.5% better in maximum speed. Neither intervention reported excessive soreness post-sessions.

**Discussion:** These findings indicate that sprint training for the mitigation of HSI risk factors is a promising training intervention. Specifically, the large increase in BFLH fascicle length suggests that the inclusion of regular sprint training should contribute to a well-rounded strength and conditioning program. There appear to be no substantial differences between the two training interventions, however, both interventions outperformed control subjects who completed their normal training schedule during this period. Minimal hamstring muscle soreness, coupled with clear improvements in speed qualities suggest that sprint training acts as a performance enhancement and injury prevention method.

**Conflict of Interest Statement:** Dr David Opar is listed as a coinventor on a patent filed for a field test of eccentric knee flexor strength (PCT/AU2012/001041.2012), known commercially as the NordBord. Dr Opar is also a minority shareholder in a company (Vald Performance) that commercializes the device. David Opar is the Chair of

the Vald Performance Research Committee (a role which is unpaid). Dr Opar has received funding from Vald Performance for research unrelated to the current research. Dr Opar's brother and brother-in-law are employees of Vald Performance. Dr Opar's brother is a minor shareholder in Vald Performance. No other authors have a conflict of interest of relevance to the submission of this abstract.

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## S63

### State-wide dissemination of the Resistance Training for Teens program: An evaluation guided by the RE-AIM framework

G. Dos Santos<sup>f</sup>, P. Estabrooks<sup>b</sup>, S. Kennedy<sup>a</sup>, D. Lubans<sup>a</sup>, P. Morgan<sup>a</sup>, N. Nathan<sup>c</sup>, M. Noetel<sup>d</sup>, J. Salmon<sup>e</sup>, J. Smith<sup>a</sup>

<sup>a</sup>Priority Research Centre in Physical Activity and Nutrition, University of Newcastle, Australia

<sup>b</sup>Department of Health Promotion, University of Nebraska Medical Center, United States of America

<sup>c</sup>National Centre of Implementation Science, Hunter New England Population Health, Australia

<sup>d</sup>Institute for Positive Psychology and Education, Australian Catholic University, Australia

<sup>e</sup>Institute for Physical Activity and Nutrition (IPAN), Deakin University, Australia

<sup>f</sup>Post-Graduate Program in Physical Education Associate UEM/UEM, State University of Londrina, Brazil

**Introduction:** The health benefits of muscular fitness for youth are compelling. Current guidelines recommend young people (5-17 years) engage in muscle-strengthening activities (e.g., resistance training [RT]) on at least three days per week. However, only 13% of Australians aged 15-17 meet this guideline. Schools present a unique opportunity to introduce adolescents to RT. However, few school-based physical activity interventions have focused on RT, possibly due to reported barriers to delivery in schools. Moreover, the majority of school-based interventions do not progress beyond pilot, efficacy/effectiveness phases to be implemented at-scale. The purpose of this study was to evaluate the state-wide dissemination of the Resistance Training for Teens (RT for Teens) program using the RE-AIM framework.

**Methods:** Student-, teacher- and school-level data related to RE-AIM were collected between August 2015 and October 2020. RE-AIM was operationalised as: (i) Reach: number and characteristics of students estimated to be exposed to the program; (ii) Effectiveness: impact of the program on student-level outcomes measured in a subsample of students ( $n = 750$ ); (iii) Adoption: number and representativeness of schools with one or more teachers trained to deliver the program; (iv) Implementation: extent to which the program was delivered as intended; and (v) Maintenance: extent to which program delivery was sustained in schools.

**Results:** Estimated program reach was ~10,000 students (~5% of a total student population of ~200,000). Students were from varied socioeconomic and language backgrounds. Program participation improved students' muscular fitness, RT self-efficacy, perceived cardiorespiratory fitness and flexibility, and participation in muscle-strengthening physical activities. A total of 468 teachers from 249 schools attended program training, with 30 workshops delivered. Schools were located in diverse geographical regions across NSW. Program implementation was measured via lesson observations and we observed considerable variability in the quality of program implementation. Resources were used in the majority of lessons; however, teachers had adapted the program to suit their students and school context. Despite the adaptations that were evident, the

necessary focus on RT remained. Adherence to the SAAFE (Supportive, Active, Autonomous, Fair and Enjoyable) teaching principles was high during observed lessons. Fifty-one schools (20.5%) sent an additional (previously untrained) teacher to a second workshop.

**Discussion:** Although the RT for Teens had high levels of reach and adoption, there was considerable variability in the quality of program implementation. Additional research is needed to identify support models to optimise implementation quality and sustain program delivery and effectiveness over time.

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## S64

### Acute effects of gait interventions on tibial stress during running: A systematic review and meta-analysis

J. Bonacci<sup>a</sup>, A. Fox<sup>a</sup>, M. Keast<sup>a</sup>

<sup>a</sup>Centre for Sport Research, School of Exercise and Nutrition Sciences, Deakin University, Australia

**Introduction:** High running volumes are a risk factor for sustaining tibial stress injuries. Changing running technique and/or equipment can alter the load and stress placed on the tibia. The ability of interventions to modify tibial stress during running are yet to be synthesised and evaluated. We systematically reviewed the effect of technique and footwear interventions on tibial stress during running.

**Methods:** Two searches of electronic databases were conducted using key terms relevant to tibial stress and running. Studies were included if: (1) participants were 18 – 45 years of age; (2) the immediate effect of a gait retraining or footwear intervention during running was evaluated; and (3) a measure of tibial stress was used. Interventions and corresponding data were categorised according to their approach (i.e. Footwear; barefoot running; running speed; surface; overground versus treadmill; orthotics, insoles and taping and technique). Methodological quality and risk of bias of included studies was assessed. Standardised mean differences (SMD) with 95% confidence intervals (95% CI) for changes in tibial stress following the intervention were calculated for all relevant studies and meta-analyses were performed where possible.

**Results:** Database searches yielded 1530 articles, with 33 meeting the inclusion criteria. Tibial stress measures increased when individuals ran barefoot (SMD 1.16 [95% CI 0.50, 1.82]), in minimalist shoes (non-habitually) (SMD 0.89 [95% CI 0.40, 1.39]), in motion control shoes (SMD 0.46 [95% CI 0.07, 0.84]), increased stride length (SMD 0.86 [95% CI 0.18, 1.55]), and with increased running speed (SMD 1.03 [95% CI 0.74, 1.32]). Tibial stress measures decreased when individuals ran on a treadmill versus overground (SMD -0.83 [95% CI -1.53, -0.12]), and when targeted biofeedback was used (SMD -0.93 [95% CI -1.46, -0.41]).

**Discussion:** Reducing the stress and loading on the tibia may reduce the risk of tibial stress injuries. We found several gait alterations that increase tibial stress measures during running and suggest that these be minimised during training periods of high load or be avoided with runners at-risk or recovering from a tibial stress injury. We also found that running on a treadmill versus overground, and the use of biofeedback can reduce tibial stress measures. These interventions could be adopted to target tibial stress reductions in runners training or rehabilitation.

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