

Methods: We evaluated the Burn 2 Learn (B2L) intervention using a cluster randomised controlled trial with older adolescents (N=670) from 20 secondary schools in New South Wales, Australia. We utilised a range of implementation strategies to support teachers to facilitate the delivery of 2-3 high intensity interval training (HIIT) sessions/week during lesson-time. The B2L intervention included the following: (i) information seminar for students delivered by school champions, (ii) school-based HIIT sessions delivered during lesson time, (iii) purpose-built smartphone application (app) and heart rate monitors designed to quantify individual and group heart rate and support self-monitoring, and (iv) information newsletters for parents. The HIIT sessions involved a combination of aerobic and muscle-strengthening exercises, designed to be enjoyable and vigorous in nature. Teachers and students in the control group continued with their usual practice. Outcomes were assessed at baseline, 6 and 12-months. The primary outcome was CRF (multi-stage fitness test). Secondary outcomes included physical activity (ActiGraph GT9X Link accelerometers), hair cortisol concentrations, muscular fitness (push-up and standing long jump tests), body composition (body mass index), mental health and HIIT self-efficacy (questionnaires). Data were analysed using linear mixed models, accounting for clustering of effects at the class level. Potential moderators of effects were identified a priori and sub-group analyses were conducted if interaction tests were significant ($p < 0.1$).

Results: At the primary endpoint (6-months), we found a significant difference between groups (in favour of B2L) for the primary outcome CRF [4.0 laps (95% CI, 1.7 to 6.4)] and a range of secondary outcomes. Moderator analyses revealed reduced stress and internalising problems among adolescents in the intervention group who were identified as 'at-risk' of poor mental health at baseline.

Discussion: Implementing high intensity breaks during curricular time improved CRF and muscular endurance among the full sample of older adolescents, and mental health among the 'at-risk' sub-sample. Our findings highlight the health benefits of re-allocating a small amount of curriculum time to physical activity during the final years of secondary school.

Trial registration: ACTRN12618000293268

My co-authors and I acknowledge that we have no conflicts of interest of relevance to the submission of this abstract.

<http://dx.doi.org/10.1016/j.jsams.2021.09.018>

S32

Physical literacy & early childhood executive function and language development: Active Early Learning randomised controlled trial

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Background: Executive function involves a number of cognitive processes that are integral to the self-regulation of behaviour and developing social and cognitive competence in young children. Physical activity is increasingly recognised as an important determinant of cognitive functioning among older populations but less is known about these relationships in early childhood. In younger populations, it has been suggested that interventions aiming to increase physical activity should focus on children's physical literacy. Physical literacy can be defined as developing capabilities in the physical, psychological, cognitive and social domains that facilitate and promote an active lifestyle across the life course. The contribution of physical literacy programs to the healthy development of language and executive function during early childhood is yet to be fully investigated. In this randomised controlled trial, we examined the effect of a physical literacy curriculum, delivered in an early learning centre setting on

child executive function and language development.

Methods: 321 children aged 3-5 years from 16 early learning centres were randomly assigned to the intervention (8 centres; n=169 children) or control group (7 centres, n=152 children). The intervention group received 20 weeks of the physical literacy curriculum, while the control group received usual practice care. Executive function (inhibition [Go/NoGo]; visual spatial working memory [Mr Ant]; shifting [Card Sort]) and expressive vocabulary was assessed using the Early Years Tool Box. Linear mixed effects models were used to determine differences in groups, adjusting for clustering of children within centres.

Results: Children receiving the intervention had greater improvements on measures of inhibition ($\beta = 1.97, p = .001$) and expressive vocabulary ($\beta = 0.5, p = .033$), compared to control group children. No significant differences were observed for visual-spatial working memory or shifting.

Discussion: A physical literacy curriculum that aligns with the Australian Early Years Learning Framework and is fully integrated into early learning centre practices is beneficial in improving aspects of young children's executive function and language development. These data support the case for greater investment in physical literacy professional development for educators working in early learning centres.

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

<http://dx.doi.org/10.1016/j.jsams.2021.09.020>

S33

Hormone therapy and exercise as interventions for post-menopausal women with greater trochanteric pain syndrome. A randomised clinical trial

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Background: Greater trochanteric pain syndrome (GTPS) is a debilitating condition, prevalent in post-menopausal women. A positive association between high oestrogen levels and tendon health may exist. Menopausal hormone therapy (MHT) could reduce the incidence of tendon abnormality in post-menopausal women, particularly when combined with exercise. This blinded 2 x 2 factorial randomised clinical trial (GLOBE Hip Trial) aimed to determine the effect of MHT and exercise on tendon pain and function in post-menopausal women with GTPS.

Methods: A total of 132 post-menopausal women (mean age 61.1 ± 6.4 years, BMI 28.6 ± 5.43) with GTPS were randomised into either MHT (oestradiol 50mcg and norethisterone acetate 140mcg) or placebo transdermal cream groups and either tendon-specific/GLOBE or sham exercise groups for a 12-week intervention period. All groups received education on avoiding gluteal tendon compression. Primary (Victorian Institute of Sport Assessment - Gluteal Tendon (VISA-G)) and secondary (Assessment of Quality of Life, Hip Disability and Osteoarthritis Outcome Score, Oxford Hip Score, Global Rating of Change) outcomes were measured at baseline, 12 and 52 weeks. A linear mixed effects model (of best fit) was used to compare groups at each time point and changes over time. Body mass index (BMI) was included as a covariate.

Results: All groups improved over time, regardless of intervention. There was no difference between targeted or sham exercise or MHT and placebo creams (raw unadjusted and including BMI as covariate) at each timepoint. VISA-G outcome was significantly associated with BMI ($p = 0.003$) and there was a significant interaction effect between cream and BMI ($p = 0.03$). The population was therefore stratified based on BMI ($< 25, < 30, \geq 30$). The MHT groups (with exercise and education) had

significantly better VISA-G (baseline $p=0.04$, MD=-11.2, 95%CI=-21.70:-0.70, 12 weeks $p<0.00$, MD=-20.72, 95%CI=-31.22:-10.22, 52 weeks $p<0.00$, MD=-16.71, 95%CI=-27.21:-6.22) and secondary measure scores compared to placebo at all timepoints when BMI<25.

Discussion: MHT or placebo combined with tendon-specific or sham exercise plus education reduced pain and increased function for this population. Women with BMI<25 who were allocated MHT with any exercise plus education were better than placebo cream. MHT may be an effective intervention for post-menopausal women with GTPS when BMI <25 and when prescribed in conjunction with any exercise plus education. Any exercise strategy is effective when prescribed with education about avoiding gluteal tendon compression and load management.

Conflict of interest: None declared.

<http://dx.doi.org/10.1016/j.jsams.2021.09.021>

S43

Joint Associations of Physical Activity and Insomnia Symptoms with Incident Mood Disorder in a population-based cohort study

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Background: When examined as separate risk factors, low physical inactivity and insomnia symptoms are both associated with increased risk of mood disorders including depression, however few studies examine these risk factors jointly. The aim of this study was to examine the joint association of physical activity and insomnia symptoms with the incidence of mood disorder in Australian adults.

Methods: Data were drawn from the 2013-2018 waves of the annual Household Income and Labour Dynamics in Australia panel study. In 2013, participants completed a survey assessing mood and anxiety disorder, physical activity, insomnia symptoms, lifestyle behaviours (i.e., diet, sleep duration, smoking, alcohol), reported diagnosis of depression/anxiety, and sociodemographic characteristics. Incident mood disorder was assessed using the MHI-5 and defined as mood disorder (MHI-5 score <54) in 2013 and no mood disorder (MHI-5 score >54) in 2014-2018. Physical activity was assessed using the IPAQ-SF and classified as low, moderate, and high using standard scoring protocols. Insomnia symptoms were assessed using three items assessing poor sleep quality and difficulty initiating and/or maintaining sleep and dichotomised as Insomnia symptoms/ No Insomnia. Participants were then classified into one of six groups representing distinct combinations of physical activity and insomnia symptoms. Only participants with complete data on covariates and exposure variables and who were free of mood disorder in 2013, and who had at least one follow-up survey during 2014-2018 were included in the analysis. A discrete-time proportional-hazards model was estimated using a logit-hazard (i.e., logistic) regression model to examine the association between joint categories of physical activity and insomnia symptoms and incident mood disorder between 2014-2018 adjusted for sociodemographics, lifestyle behaviours and prior/current diagnosis of depression/anxiety.

Results: There were 11,023 participants with complete data and no mood disorder in 2013. The incidence of mood disorder in 2014-2018 was 21.1%. Relative to participants classified as High PA/No insomnia symptoms, reporting either High PA/Insomnia (OR = 1.87, 95% CI 1.57,

2.23), Moderate PA/Insomnia (OR = 1.94, 95% CI 1.62, 2.32), or Low PA/Insomnia (OR = 2.33, 95% CI 1.96, 2.77) was significantly associated with increased likelihood of incident mood disorder.

Discussion: The combination of any level of physical activity and insomnia symptoms was associated with an increased likelihood of reporting mood disorder during the following five years, and this increased as physical activity decreased. These observations highlight the potential benefit of interventions targeting physical activity and insomnia symptoms to promote good mental health.

Conflict of Interest Statement: My co-authors and I acknowledge that we have no conflict of interest of relevance to the submission of this abstract

<http://dx.doi.org/10.1016/j.jsams.2021.09.022>

S55

Prevalence of chronic conditions in masters games athletes

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Introduction: Masters athletes (MA) are typically individuals 35 years of age or older who engage in sporting competitions or systematic training. They are widely reported to be healthier and to exhibit a lower risk of chronic conditions than age-matched peers. Few studies have examined the prevalence of chronic conditions in MA. The study aimed to identify the prevalence of chronic conditions and their possible predictors in MA, and their prevalence compared to the general population.

Methods: Masters athletes competing at the 2017 Australian Masters Games (n= 4,848) and 2018 Pan Pacific Masters Games (n=14,455) were invited to complete an online survey collecting data on demographics and health, including presence of chronic conditions. A logistic regression model was built to investigate the association between demographic and lifestyle factors and the prevalence of having at least one chronic condition in MA. The 2017-18 Australian National Health Survey (AHS) provided data on the general Australian adult population. Age- and sex-adjusted prevalence of selected chronic conditions was compared with AHS data using a weighted t-test, and p values were adjusted for multiple comparisons. Statistical analyses were conducted using R version 3.6.3 and level of significance $\alpha=0.05$.

Results: A total of 814 MA (53.7±10.6 years, 60.7% female) completed the targeted survey questions. Overall, 53.1% of MA had at least one chronic condition, with the most prevalent being food allergies and intolerances (14.9%), osteoarthritis (13.3%), heart conditions (11.2%), asthma (10.3%), anxiety (8.9%), depression (6.9%), and hypertension (4.5%). Being female and drinking more than two standard drinks per day had a higher OR for having at least one chronic condition (OR, 1.6; 95%CI, 1.2-2.2 and OR, 2.3; 95%CI, 1.1-5.0 respectively). The prevalence of osteoarthritis was similar in MA compared to the general population (11.3%; 95%CI 9.1-13.6; 13.5% respectively, $p=0.45$). The prevalence of all other chronic conditions was lower in MA compared to the general population (anxiety, asthma, cancers, depression, hyperlipidaemia, hypertension, osteoporosis, type 2