SSM abstract

The abstract should be a maximum of **400 words** (excluding the title)

Are active boys and girls at increased risk of hospital attendance or admission for injury? A longitudinal study in Wales and Scotland using linked cohort and electronic health records

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Introduction Children and young people are being encouraged to increase the amount of time they spend being physically active, especially in activities of moderate and vigorous intensity. However, there is limited evidence on the prospective association of activity levels with injuries requiring health service utilisation. We examined the relationship between objectively-measured physical activity (PA) in childhood and subsequent hospital attendances or admissions for injuries, using linked electronic health records (EHR) from a nationally representative prospective cohort of children in Wales and Scotland. We hypothesised that children engaging in higher intensity PA at age seven experience higher rates of injury-related health service utilisation in later childhood and early adolescence.

Method We analysed accelerometer-based estimates of moderate and vigorous (MVPA) and vigorous PA (VPA) from 1585 (777 [weighted %: 46%] boys) seven-year-old Millennium Cohort Study members, living in Wales or Scotland, whose parents consented to linkage of cohort to EHRs up until their 14th birthday. We fitted negative binomial regression models adjusted by potential individual (sex, longstanding illness and weight status of child), household (poverty indicator, maternal age at birth of cohort child) and area-level (urban/rural) confounders, in order to estimate associations between average daily minutes of MVPA and VPA and number of hospital in-patient admissions and emergency department attendances for injuries from age nine to 14 years.

Results Children spent respectively a median of 59.5 (IQR 46.4, 75.2) and 18.1 (12.5, 25.3) minutes in MVPA and VPA/day, with boys on average significantly more active than girls; 47.3% experienced at least one injury-related admission/attendance. Associations of each 10 minute increment in MVPA and VPA with number of admissions or attendances were strong and significant in boys: adjusted rate ratio [RR] (95% CI): 1.09 (1.01, 1.17) and 1.16 (1.00, 1.34), respectively, but not in girls: 0.94 (0.86, 1.03) and 0.85 (0.69, 1.04), respectively.

Conclusion This is to our knowledge the first nationally representative prospective analysis examining associations between objectively measured PA in childhood and health service utilisation for injuries in childhood. We found that seven-year-old boys who engaged in more intense PA had higher injury-related admission or attendance rates from nine to 14 years than less active boys. While there was some suggestion of a protective effect of MVPA and VPA in girls, neither were significant. These findings may reflect gender differences in choice of active pursuits and will be the subject of future analyses.