4. Cross MJ, Williams S, Trewartha G, et al. The Influence of In-Season Training Loads on Injury Risk in Professional Rugby Union. Int J Sports Physiol Perform 2015.

THE RELATIONSHIP BETWEEN TRAINING LOAD AND INJURY RATES IN ADOLESCENT MALES PARTICIPATING IN HURLING DURING A 12-MONTH CALENDAR YEAR

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Introduction and Aims: Injuries can have undesirable effects on the performance of participants in team sports (1). As spikes in training load may precede injury, it is important to monitor and evaluate training loads to reduce the potential risk of injury (2). One of the aims of this prospective observational analytical cohort study was to investigate the association between injury rates (IR) and training load during a post primary school and GAA club season within a 12-month calendar period in adolescent males participating in hurling.
Methods: 821 male subjects aged 13 – 18.5 (15.9 ± 1.9 yrs.) years were recruited from fourteen post primary schools (n=581) and six GAA clubs (n=240). Participants entered information daily on a mobile phone web application, including the number of training sessions, competitive matches, activity duration (mins), activity rates of perceived exertion (RPE) along with injury data. From this information, participant training units (TU) and injury rates (IR) per 1000 hours of activity, with respective 95% confidence intervals (CI) were determined.
Results: A total of 151 lower extremity injuries were reported during 66,042 hours of activity. The post primary school season (Oct.-Apr.) reported a total of 2,262,026 TU with a lower extremity IR of 13.71/1000 hrs. (CI: 11.01-16.41) of participation. The GAA club season (May-Sep.) reported 1,124,775 TU with an IR of 14.08/1000 hrs. (CI: 10.26-17.91). The highest IR was reported in October (IR 4.87/1000hrs., 95% CI: 3.2-6.5), at the beginning of the school hurling season, which was the third highest month for player activity (357,051 TU). September had the lowest recorded IR of 1.17/1000hrs. (95% CI: 0.0-2.8) and TU of 87,919 during the 12-month period.
Conclusion: With adolescent hurling players constantly being exposed to high training and competition loads along with academic stress, it is crucial to monitor the risks connected to the potential negative consequences (3). Monitoring and evaluation of adolescent training loads is an integral part of assessing injury risk and can provide team coaches with valuable information, which may inform training scheduling and potentially reduce IRs in adolescent males participating in hurling.
Reference
(1) Hägglund M. et al. (2013) British Journal of Sports Medicine. 2013;47(12):738-42.
(2) Drew, M.K. et al. (2016). British Journal of Sports Medicine, 2015-095871.
(3) Halson, S.L. (2014) Sports Medicine, 44, pp.139–147.

INVESTIGATING THE EPIDEMIOLOGY AND MODIFIABLE RISK FACTORS FOR INJURY IN ADOLESCENT GAA

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Introduction & Aims: Recent research suggests that 32.5% of adolescent GAA players suffer injury in a given year (1). There are various associated benefits to increased training exposure for adolescent athletes. However, potentially negative associations to high training loads also exist (2). The relationship between training loads and injury has gained some interest of late and a number of papers have been published on the issue (3–5). Much of the research to date has been carried out on adult athletes, with limited research available for adolescents. The objective of this study was to identify any relationships between training load and injury risk among adolescent Gaelic games players.
Methods: 1396 adolescent GAA players (mean age: 16.3±1.7 years) were recruited from GAA teams across Leinster. Subjects completed a daily questionnaire via the Smartabase® smartphone application providing information on daily training units and self-reported injuries. Training units were categorised into 300 unit increments running from Sunday to Saturday. Injury Risks (IR) were calculated as the number of injuries sustained relative to the number of exposures to each training category. Relative Risks (RR) were significant when the CI did not contain the null of 1.00.
Results: Different levels of injury risk were found within each category of training load, with the lowest level of absolute risk (AR) found in the first category (0-300 units: AR = 7.46%). There appears to be a threshold for injury risk for athletes with greater than 1200 training units per week presenting with a 51.7% increased risk of injury compared to those with less than 1200 units per week (RR = 1.52, 95% CI; 1.25-1.84).
Conclusion: The relationship between higher training loads and increased risk of injury corresponds with previous literature in adolescents (2,3). 1200 units correlates to four 'hard' 60 minute sessions per week and may indicate a threshold for overtraining in youth athletes. While the acute:-chronic training load ratio(5) has gained much interest in recent research, establishing thresholds may provide a more efficient mode of monitoring TL within this cohort. Further research may aid in establishing the validity of using training load thresholds for injury prevention.
References
1. O' Connor S, McCaffrey N, Whyte EF, Moran K a. Epidemiology of injury in male adolescent Gaelic games. J Sci Med Sport [Internet]. 2015;2–6. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26094165
2. Hartwig TB, Wescombe H, Naughton GA. The Relationship Between Workloads , Physical Performance , Injury and Illness in Adolescent Male Football Players. 2014;989–1003.
3. Bowen L, Gross AS, Gimpel M, Li F-X. Accumulated workloads and the acute:chronic workload ratio relate to injury risk in elite youth football players. Br J Sports Med [Internet]. 2016;bjsports-2015-095820.
4. Hulin BT, Gabbett TJ, Lawson DW, Caputi P, Sampson J a, Blanch P, et al. The acute:chronic workload ratio predicts injury: high chronic workload may decrease injury risk in elite rugby league players. Br J Sports Med [Internet]. 2016;50(4):231–6.
5. Gabbett TJ. The training-injury prevention paradox: should athletes be training smarter and harder? Br J Sports Med. 2016;1–9.

THE ASSOCIATIONS BETWEEN TRAINING LOAD AND BASELINE CHARACTERISTICS ON MUSCULOSKELETAL INJURY AND PAIN IN ENDURANCE SPORT POPULATIONS: A SYSTEMATIC REVIEW

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Introduction and Aims: Over half of endurance sport populations experience injury and/or pain when training or competing. No previous systematic review or meta-analysis has evaluated the association between training load (internal and external), baseline characteristics (e.g. age and previous injury) and musculoskeletal injury and/ or pain risk within endurance sporting populations. To determine the associations between training load (internal and external), baseline characteristics (e.g. age or previous injury) and musculoskeletal injury and/or pain risk specifically within an endurance sporting population.
Methods: Eight electronic databases were searched by two independent reviewers. Studies were required to prospectively monitor musculoskeletal injury and/or pain and training loads for greater than three months.
Results: Twelve endurance sport (running, triathlon, rowing) studies were eligible. Increased injury and/or pain risk was associated with the following external training load parameters; (i) 'high' total training distances per week/month (medium effect size) (ii) training frequency of less than 2 sessions/week (medium effect size) and (iii) both low weekly (less than 2 hours/week) and high monthly training duration (high effect size). None of the studies reported internal training load data. The following non-modifiable baseline characteristics were identified as increasing injury and/or pain risk; (i) a history of previous injury (medium effect size) (ii) increasing age 45-50 years (small effect size) and (iii) non-musculoskeletal co-morbidities (small effect size).
Conclusions: This review highlights external training workload parameters and baseline characteristics associated with increased injury and/or pain risk within endurance sporting populations. However, the clinical applicability of these results is limited. There is an absence of research relating to internal training loads and acute:chronic workloads in relation to injury and/or pain risk within endurance sporting populations.