



Development, implementation and assessment of a concussion education programme for high school student-athletes

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ABSTRACT

Although experts have noted that adolescent athletes should be educated about concussions to improve their safety, there is no agreement on the most effective strategy to disseminate concussion education. The purpose of this study was to develop, implement and assess a concussion education programme. More precisely, four interactive oral presentations were delivered to high school student-athletes ($N = 35$, $M_{\text{age}} = 15.94$, $SD = 0.34$) in a large urban centre. Participants completed a questionnaire at three time-points during the season to measure changes in their knowledge (CK) and attitudes (CA) of concussions, and focus group interviews were conducted following the concussion education programme. Questionnaire data revealed participants' post-intervention CK scores were higher than their pre-intervention scores. During the focus groups, the student-athletes said they acquired CK about the role of protective equipment and symptom variability, and in terms of CA, they intended to avoid dangerous in-game collisions in the future. Our study was the first to create and deliver a concussion education intervention across multiple time-points, and to use mixed-methods in its assessment. These findings may be of interest to researchers, practitioners and stakeholders in sport who are invested in making the sport environment safer through concussion education and awareness.

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Approximately 54% of Canadians aged 15–19 participate in organised sport each year (Canadian Heritage, 2013). Sport participation has long been advocated as a way for youth and adolescents to acquire important life skills such as leadership and teamwork and to contribute to their physical and psychosocial well-being (Côté, Bruner, Erickson, Strachan, & Fraser-Thomas, 2010). However, adolescents who participate in high school athletics commonly suffer musculoskeletal injuries (e.g., Swensen et al., 2013). Concussions are one type of injury that has an elevated incidence rate in high school athletics (Marshall, Guskiewicz, Shankar, McCrea, & Cantu, 2015). In fact, researchers have found that concussions are particularly problematic for high school athletes because they tend to underreport symptoms (Register-Mihalik et al., 2013) and because their symptoms are more severe and persistent compared to older athletes (Williams, Puetz, Giza, & Broglio, 2015). Given that researchers are now linking multiple concussive and subconcussive head impacts with dementia and chronic cognitive impairment (Stein, Alvarez, & McKee, 2015), there is a need to educate high school athletes about concussions in order to improve their safety and reduce the occurrence of this injury of epidemic proportion.

Researchers have estimated that 1.6–3.8 million concussions occur annually in sports and recreation in the United States alone (Langlois, Rutland-Brown, & Wald, 2006). These

statistics likely underestimate the true occurrence of concussions because signs of the injury (i.e., transient loss of consciousness) are rarely observable after acute injury (McCrary et al., 2013). As a result, many athletes are not evaluated for a concussion because they do not seek medical care for reasons that range from deliberately hiding symptoms from teammates, coaches and/or medical professionals, to inadvertently ignoring concussion symptoms due to a lack of knowledge about the injury (e.g., Davies & Bird, 2015; Delaney, Lamfookon, Bloom, Al-Kashmiri, & Correa, 2015; Kroshus, Baugh, Daneshvar, & Viswanath, 2014; Register-Mihalik et al., 2013). For example, Delaney et al. (2015) found that student-athletes did not report concussion symptoms because they did not believe they had suffered a serious enough injury to warrant medical attention. Underreporting concussions has been a consistent finding across studies, despite the fact that large-scale concussion education initiatives such as the US Centers for Disease Control and Prevention's "HEADS UP to concussions" campaign have existed for more than a decade (Sarmiento, Hoffman, Dmitrovski, & Lee, 2014).

Experts have highlighted the importance of improving concussion education initiatives (McCrary et al., 2013). Despite this recognition, little is known about the most effective ways to educate athletes about concussions (Caron, Bloom, Falcão, & Sweet, 2015). Large-scale concussion education initiatives