ABSTRACT

**Background:** There are no current sport concussion assessments that capture the effects of dual-task conditions on gait. Multiple studies have evaluated changes, but none have comprehensively examined literature related to the adolescent and young adult population.

**Purpose:** The purpose of this systematic review is to synthesize documented changes in gait under dual-task conditions in adolescents and young adults after sustaining a concussion.

**Study Design:** Systematic Review

**Methods:** The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was consulted to guide this systematic review. Six databases were searched: Cinahl, ProQuest, PubMed, Scopus, SPORTdiscus, and Web of Science. Concussion, gait, and dual-task, along with their synonymous terms were the search terms used. Inclusion criteria consisted of adolescent and young adult age groups, acute concussion, dual-tasking, and matched controls. Quality assessment was performed using The Joanna Briggs Institute Critical Appraisal Checklist for Case Control Studies.

**Results:** Ten full-text articles were selected for inclusion. Concussed individuals demonstrated longer stride times with shorter stride lengths, increased mediolateral displacement with corresponding increases in sagittal and frontal plane peak velocity, and decreased sagittal plane Center of Mass (COM) and Center of Pressure (COP) displacement. The majority of included studies demonstrated moderate to large effect sizes in these gait characteristics.

**Conclusion:** Concussed individuals demonstrated decreased gait stability while ambulating with a dual-task condition. Though statistically significant differences between concussed individuals and matched controls lasted only 72 hours, concussed individuals demonstrated continued improvements in gait for up to two months post-injury, which has the potential to affect an athlete’s ability to perform. Further research is needed to determine if a gait examination with a dual-task condition is a realistic, reliable, and valid measure to be included in return to sport testing.

**Level of Evidence:** 2a

**Key words:** Adolescent, concussion, dual-task, gait