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## Poster #: 2

**Abstract Title:** Assessing Technological Applications Used For The Cognitive Assessment and Rehabilitation Of Concussed Individuals: A Scoping Review

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### **ABSTRACT:**

**Abstract Theme:** Mild TBI / Concussion

**Topic(s) of Interest:** Knowledge Translation

**Purpose of Project:** Technological advancements have influenced the landscape of cognitive assessments and rehabilitation yet their use in the concussed population remains underexplored. The purpose of this scoping review is to examine the role of technology, any application that involves the use of a computer-generated program, in the cognitive assessment and rehabilitation of people with concussions.

### **Methods, Procedure, Results/Outcome, Conclusion:**

**Methods:** A search string was used in three databases to generate relevant articles. An inclusion/exclusion criteria was previously formulated and was used when screening articles. In an effort to analyze a wide range of cognitive applications, there were no restrictions on the year of publication or the type of primary research study that occurred. The scoping review followed the Arksey and O'Malley framework and PRISMA – ScR guidelines.

**Procedure:** Two coders independently screened the articles through abstract and full-text review; conflicts were resolved through discussion until consensus was reached. The following categories were analyzed in each article: (1) the area of cognitive function targeted by the application, (2) the participants population (e.g., military, athletes, etc.), (3) the quality of assessment and therapeutic impact, and (4) participants inclusion in the designing of the application. A critical evaluation of the articles was completed using the Mixed Methods Appraisal Tool.

**Results:** Seventeen articles passed all screening phases and were included in this review. A total of 19 applications were found within the articles, each application used various technologies: Virtual Reality (VR) (12/17, 70.6%), computer based applications (8/17, 47.1%), and robotics with VR (2/17, 11.8%). Four (23.5%) articles focused solely on cognitive function, while the remaining assessed and/or rehabilitated various areas of function. Thirteen (76.5%) articles used their application to assess cognition, with many (14/17, 82.6%) participant populations focusing on athletes and military members/veterans. Concerns arose regarding the validity of standard computer-based cognitive assessments, while VR applications appeared to be a potential alternative. Only two (11.8%) articles requested participant feedback to improve the design of the application.

**Conclusion:** Numerous applications have been used to assess and/or rehabilitate cognitive impairments in concussed individuals. However, the lack of end-user feedback fails to describe the preferences and challenges encountered by stakeholders when using the applications. Given the focus of studies on the military/veteran and athlete populations, researchers should consider recruiting concussed individuals from the general civilian population to ensure applications are representative. Future studies should analyze the use of technological applications for the cognitive rehabilitation of the concussed population.