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## Do Athletes with Musculoskeletal Injuries Show Similar Patterns of Cognitive Decline as Seen in Concussed Athletes?

Janae Wicker

*Wilmington College*, [jwicker@wilmington.edu](mailto:jwicker@wilmington.edu)


Larry Howard

*Wilmington College*, [larry\\_howard@wilmington.edu](mailto:larry_howard@wilmington.edu)

Erika Smith-Goodwin

[erika\\_goodwin@wilmington.edu](mailto:erika_goodwin@wilmington.edu)

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## ***Do Athletes with Musculoskeletal Injuries Show Similar Patterns of Cognitive Decline as Seen in Concussed Athletes?***

Janae Wicker, Larry Howard MA, AT, ATC, Erika Smith-Goodwin, PhD, AT, ATC

Sports Sciences, Wilmington College

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### **CONTEXT**

A general consensus has been reached that concussions cause cognitive disruption.<sup>1</sup> New research has suggested that musculoskeletal injuries can cause similar effects to athletes.<sup>2,3,4,5</sup>

### **OBJECTIVE**

The purpose of this study was to determine if musculoskeletal injuries show similar patterns of cognitive decline as seen in concussed athletes using subjective testing.

### **DESIGN and SETTING**

This study used an 8 part, Likert scale survey to subjectively assess perceived signs and symptoms of cognitive decline in musculoskeletally injured and concussed athletes. This research was conducted on athletes of a private, D3, liberal arts institution in the Midwest. The independent variables are musculoskeletally injured, athletes, and uninjured athletes, male and female athletes, and contact vs. non-contact sports. The dependent variable is cognitive deficits shown by survey results.

### **PARTICIPANTS**

A convenience sample target population of N=62 was taken with a return rate of 100% (n=62). Of the 62 athletes surveyed, 69.4% were male (n=43), 30.6% female (n=19); 45% were freshmen (n=28), 15% sophomores (n=9), 31% juniors (n=19), 10% seniors (n=6); 83.9% in contact sports (n=52), 16.1% non-contact sports (n=10); 16.1% had concussions (n=10), and 83.9% musculoskeletal injuries (n=52).

### **INTERVENTIONS**

The survey asked for athletes to identify signs and symptoms shown to indicate cognitive decline. Demographic information was nominal and all other data was ordinal. Content validity was established through the Table of Specifications. Face validity was established through review by a panel of experts. This research was approved through expedited review by the College's Institutional Review Board. Descriptive statistics (frequency counts and percentages) were calculated for all applicable items. A Kruskal-Wallis Test analyzed grade in school as the grouping variable and Pearson's Chi Square tests analyzed whether or not they experienced various signs and symptoms as the grouping variables. The alpha level was set at  $p=.05$  *a-priori* and data was analyzed with SPSS 21.0.

### **MAIN OUTCOMEMEASUREMENTS**

Parts 1-5 were on a 2-point, yes or no Likert scale, 6-7 addressed demographics, and question 8 was on a 2-point, contact or non-contact Likert scale.

### **RESULTS**

Non-statistically significant results were found for survey research showing that athletes with musculoskeletal injuries experienced similar signs and symptoms of cognitive decline as concussed athletes in subjective testing. 35% (n=34) of musculoskeletally injured athletes had difficulty sleeping compared to 20% (n=8) of concussed athletes, 15% (n=8) of musculoskeletally injured athletes felt it took

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longer to complete homework assignments compared to 60% (n=6) concussed athletes, 38% (n=20) of musculoskeletally injured athletes felt anxious compared to 50% (n=5) of concussed athletes, 27% (n=14) of musculoskeletally injured athletes and 40% (n=4) of concussed athletes felt un-motivated, 17% (n=9) of musculoskeletally injured athletes and 20% (n=2) of concussed athletes felt depressed, and 38% (n=20) musculoskeletally injured athletes and 50% (n=5) concussed athletes had anxiety. Statistical significance in musculoskeletally injured athletes was found in 23% (n=10) of men feeling anti-social as compared to 0% (n=0) of women, ( $H=5.268$ ,  $df=1$ ,  $p=.022$ ).

#### **CONCLUSIONS:**

For athletes in this study, subjective data supported the idea that athletes with musculoskeletal injuries had similar signs and symptoms associated with cognitive decline as athletes with concussions. This warrants further research on psychosocial studies and indicates a need for Athletic Trainers to monitor cognitive and psychological health in

collegiate athletes with musculoskeletal injuries.

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**KEY WORDS:** *concussion, musculoskeletal injury, cognitive deficit, cognitive decline, athletic identity, psychological health, mental health, mental well-being*