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## Determining the Psychometric Properties of an Instrument to Assess Healthcare Availability in Adolescents Diagnosed with a Sport Related Concussion

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## ***Determining the Psychometric Properties of an Instrument to Assess Healthcare Availability in Adolescents Diagnosed with a Sport Related Concussion***

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### **OBJECTIVE**

Establish psychometric properties of a questionnaire assessing healthcare availability in adolescent athletes who have suffered a sport related concussion (SRC).

### **DESIGN AND SETTING**

Survey research to establish validity and reliability using three public school districts, two in Central Ohio and one in West Virginia.

### **PARTICIPANTS**

A convenience sample ( $n = 23$ ) of athletes between 12-19 years ( $\bar{x} = 14.78 \pm 1.62$ ) was recruited. Inclusion criteria were (1) diagnosed with a SRC while participating on school-sponsored sports team during the 2019-2020 season, and (2) cleared without restrictions by a healthcare professional.

### **INTERVENTION**

The final questionnaire consisted of 19 items, scored with two scales (1-3 and 1-5), was created from an established instrument called the Measure of Effective Availability and Accommodation Survey (MEAAS) (Cronbach's  $\alpha = 0.84$ ). Additional items were drafted based upon recent literature identifying risk factors associated with concussions in an adolescent population.

### **MAIN OUTCOME MEASUREMENT**

Seven of nine recruited experts (response rate = 78%) in concussion research as well as the development and implementation of instruments provided feedback regarding face and content validity. Three items were amended based upon recommendations. Next, three adolescents completed a pilot test to determine functionality of the Qualtrics instrument. Descriptive statistics for participants (response rate = 78.2%) were

compiled by age, sex, academic rank, and concussion history. The study fell short of the 130 participants required for a factor analysis; thus, reliability was assessed through internal consistency and floor and ceiling effects (a priori < 30%).

### **RESULTS**

Reliability was assessed for 13 items using a measure of internal consistency (Cronbach's  $\alpha = 0.64$ ). Six screening items were excluded from the analysis. Individual item analysis indicated that the homogeneity of the questionnaire could not be improved by removing any of the analyzed 13 items. 10 items demonstrated appropriate floor effects, 3 failed to meet the a priori value of <30% (5c = 81.8%; 5f = 31.6%; 6h = 42.1%). Only 4 of the 13 demonstrated appropriate ceiling effects (5c = 13.6%; 6c = 18.8%; 6g = 0.0%; 6h = 21.1%).

### **CONCLUSION**

The internal consistency (Cronbach's  $\alpha = 0.64$ ) suggests a moderate level of agreement among items, but falls short of the measure (Cronbach's  $\alpha = 0.84$ ) produced in previous studies of adults. Based upon an analysis of inter-item correlations, two items (5b, 6g) failed to correlate well ( $r < 0.25$ ) with other items. Yet, deleting either item did not improve the overall Cronbach's  $\alpha$ . We theorize that there may be two distinct factors within the questionnaire. A factor analysis would be able to confirm this and may result in improved internal consistency. Future studies would benefit from recruiting a larger sample size to confirm validity and reliability.

**KEY WORDS:** *Availability and Accommodation, Healthcare Access, Adolescent Athletes, Concussion Barrier*