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## Validation of an Instrument to Assess Return to Play and Return to Learn Protocols in Adolescents Diagnosed with a Sport Related Concussion

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## ***Validation of an Instrument to Assess Return to Play and Return to Learn Protocols in Adolescents Diagnosed with a Sport Related Concussion***

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### ***OBJECTIVE***

Establish the validity and reliability of a questionnaire to assess return to learn (RTL) and participation (RTP) practices in adolescent athletes who suffered a sport related concussion (SRC).

### ***DESIGN AND SETTING***

Survey research to establish the psychometric properties of a questionnaire at three public schools, two in Central Ohio and one in West Virginia.

### ***PARTICIPANTS***

A convenience sample ( $n = 23$ ) of athletes between the ages of 12-19 ( $\bar{x} = 14.78 \pm 1.62$ ) competing in school sponsored athletics was recruited. Inclusion criteria were: 1) previous history of diagnosed concussion during the 2019-2020 sport season, and 2) clearance for RTL and RTP by an athletic trainer or physician.

### ***INTERVENTION***

A questionnaire to describe RTP and RTL protocols was developed by reviewing literature identifying best practices in adolescent concussion management. The final version of the questionnaire resulted in 12 items describing patients' RTP and RTL protocol experiences. The scale varied; five items used a three-point scale, and two a five-point scale. Five items were open-ended.

### ***MAIN OUTCOME MEASUREMENT***

Seven of nine recruited experts (response rate = 77.8%) in concussion as well as experience in the development and implementation of instruments provided feedback to establish face and content validity. All items were

amended prior to recruiting three adolescents (ages = 13-16) to complete a pilot test to determine functionality of the Qualtrics questionnaire. Descriptive statistics (response rate = 39.1%) were summarized by age, sex, academic rank, and concussion history. Measures of internal consistency, using Cronbach's  $\alpha$ , were reported as well as item floor and ceiling effects.

### ***RESULTS***

Reliability could not be established by factor analysis as planned. The study fell short of the 70 participants required for a factor analysis. Five items were included in the assessment of internal consistency (Cronbach's  $\alpha = 0.64$ ). Due to a lack of variance, two items were excluded from the statistical analysis. Open-ended items were also excluded from the analysis. Individual item analysis indicated that the homogeneity of the domain could be improved by deleting item 6a (Cronbach's  $\alpha = 0.67$ ). Only item 5 (43.8%) failed to meet the a priori (<30%) value for floor effects. Two items (4, 9) failed to demonstrate appropriate ceiling effects, 50.0% and 45.5% respectively.

### ***CONCLUSION***

The results of this study fail to determine that the questionnaire is a reliable instrument. In this study, the Cronbach's  $\alpha$  of 0.64 is considered a moderate indicator of validity and internal consistency. Since this is the first attempt to establish the psychometric properties of the instrument, future studies will be needed to provide additional support for its use in identifying patients who may be at risk for protracted recovery.

**KEY WORDS:** *Concussion, Return to Learn (RTL), Return to Play (RTP), Adolescent Athletes*