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## Validation of an Instrument to Assess Fear Avoidance in Adolescents Who Have Been Diagnosed with a Concussion

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## ***Validation of an Instrument to Assess Fear Avoidance in Adolescents Who Have Been Diagnosed with a Concussion***

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### ***OBJECTIVE***

Establish validity and reliability of a questionnaire describing fear avoidance in adolescent athletes who have been diagnosed with a sport-related concussion (SRC).

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

Survey research to determine the psychometric properties of an instrument examining fear avoidance in adolescents who attended a public school in Central Ohio or West Virginia.

### ***PARTICIPANTS***

A convenience sample ( $n = 23$ ; 17 males, 6 females) between the ages of 12-19 ( $\bar{x} = 14.78 \pm 1.62$ ) who participated in a school sponsored sport during the 2019-2020 seasons was recruited. To be included participants must have been symptom free at the time of enrollment.

### ***INTERVENTION***

Fear Avoidance Beliefs Questionnaire (FABQ) and the Tampa Scale of Kinesophobia were modified for an adolescent population. The final draft was composed of 12 items, rated on a six-point scale (score 12-72).

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

Seven of nine experts (response rate = 77.8%) in concussion research as well as experience in the development and implementation of instruments provided feedback to establish face and content validity. Based upon expert feedback, seven items were amended prior to recruiting three healthy adolescents (age range = 13-16) to pilot test the functionality of the Qualtrics instrument. In order to determine psychometric properties of the final draft, participants (response rate = 95.7%) completed the questionnaire once

they were cleared to return to school and sport without restrictions. Descriptive statistics were analyzed by age, sex, academic rank, and concussion history. Internal consistency was determined by Cronbach's  $\alpha$ . Floor and ceiling effects were calculated per item; an a priori value of  $< 30\%$  was considered acceptable.

### ***RESULTS***

Because the participants fell short of the required number, reliability could not be established by factor analysis. Thus, validity and reliability was assessed using a measure of internal consistency (Cronbach's  $\alpha = 0.76$ ). Items 3-11 were included in the statistical analysis. Individual item analysis indicated that the homogeneity of the questionnaire could be improved by deleting item 5 or 8 (Cronbach's  $\alpha$  range = 0.77-0.78). Floor or ceiling effects were identified in a total of 6 items.

### ***CONCLUSION***

Previous studies of adults using the FABQ reported internal consistency in the range of 0.81-0.90. The Tampa Scale of Kinesiophobia has produced similar results (Cronbach's  $\alpha = 0.81$ ) in an adult population. In this study, the results provide good evidence of validity and internal consistency within an adolescent population. However, additional research is warranted before inferences can be made about adolescents' fear avoidant behaviors. Future research should scrutinize items 5 and 8 as these items produced low inter-item correlations ( $r < 0.25$ ) and demonstrated a floor effect (item 5) and a ceiling effect (item 8). Recruiting at least 90 participants will allow the questionnaire structure to be evaluated through factor analysis.

**KEY WORDS:** *Adolescent Athletes, Fear Avoidance Beliefs Questionnaire, Tampa Scale of Kinesiophobia, Concussion*