Modified PRISM and SCI-SET Spasticity Measures for Persons with Traumatic Spinal Cord Injury: Results of a Rasch Analyses

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Abstract:

Objective: To evaluate the psychometric properties of the Spinal Cord Injury Spasticity Evaluation Tool (SCI-SET) and Patient-Reported Impact of Spasticity Measure (PRISM) using Rasch analysis to optimize their validity and efficiency.

Design: Rasch analysis of the SCI-SET and PRISM represents a secondary analysis of data collected as part of a collaborative research project of the SCI Model Systems Centers. The overall survey was organized into 4 sections: (1) participant demographics and injury characteristics, (2) participant experiences of spasticity, (3) SCI-SET, and (4) PRISM. Participants were recruited from the community via multiple avenues. Data were collected and managed via an online survey tool using a secure web-based data management application.

Setting: Participating Spinal Cord Injury Model Systems Centers.

Participants: Most participants (N=1239) had lived with their injury for more than 2 years and used a wheelchair as their primary mode of mobility. The majority of the sample (58%) sustained cervical injuries.

Interventions: None.

Main outcome measures: SCI-SET and PRISM.

Results: The SCI-SET demonstrated strong measurement properties with acceptably high reliability and point-measure correlations and no evidence of multidimensionality. However, respondents underused some rating scale categories. Analyses of the PRISM demonstrated 3 distinct subscales relating to the physical, psychological, and social influences of spasticity; respondents underused some rating scale categories. Combining underused rating scale categories for both spasticity instruments resulted in increased reliability and reduced respondent burden compared with the original versions. Both the Modified SCI-SET (person separation reliability=0.93) and Modified PRISM (person separation reliability=0.85, 0.89, 0.83 for physical, psychological, and social subscores, respectively) display strong measurement properties.

Conclusions: Measurement properties of the SCI-SET and PRISM improved from use of Rasch model methods. The SCI-SET required minor revisions, whereas the PRISM required definition of subscores. Both modified spasticity measures demonstrated adequate psychometric properties, and correlations among the modified measures were high, providing evidence of convergent validity. We recommend use of the Modified SCI-SET and Modified PRISM measures in future studies.

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Participating Centers:

Southeastern Regional Spinal Cord Injury Model System

https://msktc.org/sci/model-system-centers/southeastern-regional-spinal-cord-injury-model-system

Midwest Regional Spinal Cord Injury Care System

https://msktc.org/sci/model-system-centers/midwest-regional-spinal-cord-injury-care-system