Rasch calibration of the 18-item Multidimensional Health Locus of Control – Form B Scale

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Abstract

OBJECTIVES: Health locus of control (HLOC) is among established predictors of health outcomes and patient behaviors in the management of chronic conditions (CC). The Multidimensional Health Locus of Control (MHLC) - Form B has been used for 40+ years to measure HLOC in patients with CC. However, there is no evaluation of MHLC-Form B using advanced measurement theory in a U.S. population with CC. Thus, this research aims to assess the psychometric properties of the MHLC-Form B using Rasch Analysis in an adult population with CC.

METHODS: Rasch modeling was used to examine the 18-item MHLC-Form B within 300 adults with CC recruited via MTurk Amazon. Three Rasch models were estimated for each subscale: Internal, Chance, and Powerful Others. Also, three item-person maps were used to evaluate the distribution of item level difficulty in comparison to the individual HLOC level for each subscale. Lastly, three differential item functioning (DIF) analyses were conducted to assess if any item is differently difficult between sex groups, and education levels groups. All analyses were conducted using SAS v9.4 and Winsteps v3.65.

RESULTS: No misfit items were identified. Although individual HLOC levels had wide distributions for all subscales (with Internal having the widest, -1.06 ± 1.15, -5.27 – 2.50 logits) the item difficulty levels of MHLC-Form B were concentrated in a narrowly centralized distribution, ranging from -0.43 to 0.43 logits. DIF analyses results for each subscale demonstrated proper functioning of all items across respondents varying in sex or level of education.

CONCLUSIONS: The MHLC-Form B was evaluated to have acceptable model-data fit. However, Rasch analyses revealed an overly narrow distribution of item difficulty levels across individual HLOC levels, suggesting a need for additional items to accurately measure a wider range of HLOC levels in adults with CC.