Pedi-ED- SE Scale: Psychometric Validity and Reliability Testing

Purpose:

Extant literature supports that ED health care providers lack self-efficacy for recognizing and managing pediatric emergencies, particularly in community-based hospital settings. Further, empirical evidence supports that in-situ simulation provides an effective educational venue for improving self-efficacy. However, a gap exists in measuring self-efficacy with a validated and reliable instrument. Therefore, an instrument development research study was done to construct and test the new instrument.

Methods

A thorough literature review was done to identify the salient concepts associated with healthcare providers ability to care for emergent pediatric conditions. Following item pool generation, the research team began scale construction. Three themes emerged: general concepts, recognize emergencies and manage emergencies. Careful attention was given to ensure that the item stems avoided the use of jargon, double negatives, double-barreled items and bias. Items were written to avoid nurse centric language. The team conceived that the scale would be utilized repetitively for discriminative assessments and thus defined a consistent temporal frame of reference as "currently." Initial psychometric testing included: cognitive interviews (CI), content validity (CVI) testing, test-retest validity. Scale items were edited and reduced based on these findings. The PEDI-ED-SE scale (14-items) was administered to healthcare providers (*N*=260) and subsequent structural validity (i.e., confirmatory factor analysis with principal axis factoring [PAF]) and reliability testing was done.

Results

Thirteen CI were conducted. The respondents reported a high degree of ease for completing the whole PEDI-ED-SE scale (*M*= 1.3) and subscales (general*: M*=1, recognize *M*=1.1, manage: *M*=1.9)**.** The researchers reported a high degree of concordance (r=.95) between their analysis of the correctness of responses. No respondents reported issues or concerns about the directions. Probing questions identified concerns with definitions of two terms: pediatric and precipitous labor. Eleven content experts returned CVI forms. The I-CVI ranged from 0.90-1.00. The I-CVI for the subscales were: general (I-CVI = 1.00), recognize (I-CVI =1.00) and manage (I-CVI = 0.90**).** The S-CVI was 0.95. Expert construction suggests included changes: septic shock to "shock," precipitous delivery to "fast/emergent." Coefficient of stability was calculated on subset (*n*=10) sample and showed high correlations.

Scree plot from PAF showed a major break in eigenvalue between factors 2 and 3 with all items loading significantly on factor 1 (loadings ranged between .539 and .759). Factor extraction showed factor one with an eigenvalue of 7.99 accounting for 54.53% of the common variance, factor two had eigenvalue of .98 accounting for 4.79 % of the common variance, factor three had an eigenvalue of .75 accountiith loading >.400 and .200 difference in loadings. ng for 3.15 %. Total cumulative variance = 62.38%. All factors loaded strongly on a forced 3 factor solution with rotation (loadings >.400, .200 difference, loadings ranged from .13 to .82). Sampling adequacy showed met requirements (KMO = 0.88; Bartlett's test of sphericity: *p* <.001). Cronbach alpha internal consistency met acceptable coefficient values: full scale: alpha=.92; general subscale: alpha=.79; recognize: alpha = .86; manage: alpha= .89.

Implications/Conclusions

Increasing the self-efficacy among healthcare providers caring for pediatric emergencies is a priority in all ED settings. Initial testing supports the validity and reliability of PEDI-ED-SE as a multidimensional scale with minimal respondent burden observed. This scale has the potential to improve outcome measurements for both QI or research projects. More psychometric testing is currently in progress.