Title:

Development and psychometric evaluation of the basic electrocardiogram interpretation self-efficacy scale.

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Purpose: Research suggests that nurses and nursing students lack competence in basic electrocardiogram (ECG) interpretation. Self-efficacy is considered to be paramount in the development of one's competence. The aim of this study was to develop and psychometrically evaluate a scale to assess nursing students' self-efficacy in basic ECG interpretation.

Materials and methods: Observational cross-sectional study with a convenience sample of 293 nursing students. The basic ECG interpretation self-efficacy scale (ECG-SES) was developed and psychometrically tested in terms of reliability (internal consistency and temporal stability) and validity (content, criterion and construct). The ECG-SES' internal consistency was explored by calculating the Cronbach's alpha coefficient (α); its temporal stability was investigated by calculating the Pearson correlation coefficient (r) between the participants' results on a test-retest separated by a 4-week interval. The content validity index of the items (*I-CVI*) and the scale (*S-CVI*) was calculated based on the reviews of a panel of 16 experts. Criterion validity was explored by correlating the participants' results on the ECG-SES with their results on the New General Self-Efficacy Scale (NGSE).[1] Construct validity was investigated by performing *Principal Component Analysis (PCA)* and *known-group analysis*.

Results: The excellent reliability of the ECG-SES was evidenced by its internal consistency (α=0.98) and its temporal stability at 4-week re-test (r=0.81; $p<0.01$). The ECG-SES' content validity was also excellent (all items' *I-CVI*=0.94–1; *S-CVI*=0.99). A strong, significant correlation between the NGSE and the ECG-SES (r=0.70; $p<0.01$) showed its criterion validity. Corroborating the ECG-SES' construct validity, *PCA* revealed that all its items loaded on a single factor that explained 74.6% of the total variance found. Furthermore, *known-groups analysis* showed the ECG-SES' ability to detect expected differences in self-efficacy between groups with different training experiences ($p<0.01$).

Conclusion: The ECG-SES showed excellent psychometric properties for measuring nursing students' self-efficacy in basic ECG interpretation.

References:
1. Chen G, Gully SM, Eden D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods*, 4: 62-63. doi: 10.1177/109442810141004.