

Development and psychometric evaluation of the arterial puncture self-efficacy scale

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Background: Arterial puncture for arterial blood gases (ABG) analysis can be a risky, painful, difficult-to-perform procedure that is often insufficiently practised and generates stress and discomfort amongst patients and healthcare professionals. Self-efficacy is a key component in the acquisition of procedural skills. Therefore, professionals' self-efficacy in arterial puncture should be measured before attempting the procedure on real patients. Objective: To develop and psychometrically assess a self-efficacy scale in arterial puncture. Design: An observational cross-sectional design was used in this study. Setting: Faculty of Education Sciences, Nursing and Physiotherapy in a higher education institution in the south of Spain. Participants: A convenience sample of 342 nursing students entered and completed the study. All participants met the following inclusion criteria: (1) ≥ 18 years old and (2) enrolled in a nursing degree programme during the 2014/2015 academic year. Participants were 74% female (n = 254) and their age ranged from 18 to 50, with a mean age of 21.74 years (SD = 5.14). Method: The Arterial Puncture Self-Efficacy Scale (APSES) was developed and psychometrically tested. Reliability and content validity were studied. Predictive validity and concurrent validity assessed criterion validity. In addition, principal component analysis and known-group analysis evaluated construct validity. Results: Principal component analysis revealed the two-subscale structure of the final 22-item version of the Arterial Puncture Self-Efficacy Scale (APSES). A total Cronbach's alpha coefficient of 0.97 showed its high reliability. The APSES' content validity index was excellent (S-CVI/Ave = 0.95). Predictive and concurrent validity analysis demonstrated the good criterion validity of the tool. Supporting the APSES'

sensitivity and specificity, known-groups analysis evidenced significant differences ($p < 0.001$) in self-efficacy levels between groups. Conclusion: The APSES showed good psychometric properties for measuring self-efficacy in arterial puncture for ABG analysis. © 2016 Elsevier Ltd.

Blood specimen collection

Confidence

Nursing students

Psychometrics

Self-efficacy

adult

arterial blood

artery puncture

blood gas

concurrent validity

construct validity

content validity

convenience sample

Cronbach alpha coefficient

cross-sectional study

diagnostic test accuracy study

female

human

human tissue

instrument validation

major clinical study

male

nursing student

physiotherapy

predictive validity

principal component analysis

self concept

sensitivity and specificity

Spain

university

adolescent

blood sampling

middle aged

nursing education

procedures

psychology

psychometry

puncture

questionnaire

reproducibility

standards

Adolescent

Adult

Blood Specimen Collection

Cross-Sectional Studies

Education, Nursing, Baccalaureate

Female

Humans

Male

Middle Aged

Psychometrics

Punctures

Reproducibility of Results

Self Efficacy

Spain

Students, Nursing

Surveys and Questionnaires