National Institutes of Health Stroke Scale in Plain English Is Reliable for Novice Nurse Users with Minimal Training

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Introduction: The National Institutes of Health Stroke Scale (NIHSS) is commonly used in Comprehensive Stroke Centers, but it has not been easily implemented in smaller centers. The aim of this study was to assess whether nurse providers who were naive to stroke assessment scales could obtain accurate stroke severity scores using our previously validated NIH Stroke Scale in Plain English (NIHSS-PE) with minimal or no training.

Methods: We randomly assigned 122 nursing students who were naive to stroke assessment scales to 1 of 4 groups: trained on the NIHSS, untrained on the NIHSS, trained on the NIHSS-PE, or untrained on the NIHSS-PE. The Trained/NIHSS and Trained/NIHSS-PE groups watched assessment scale-specific training DVDs. All 4 study groups scored the same 3 patients from the National Institute of Neurological Disorders and Stroke certification DVD, in randomly assigned order. Two-way repeated measures analysis of variance was used to compare group scores with those obtained by a consensus panel of NIHSS-certified expert users, and with each other.

Results: NIHSS-PE users had scores significantly closer to the expert scores compared with NIHSS users ($F_{(1,118)} = 4.656$, $P = .033$). Trained users had scores significantly closer to the expert scores than untrained users ($F_{(1,118)} = 6.607$, $P = .011$). Scores from untrained users of the NIHSS-PE did not differ from those of trained users of the NIHSS ($F_{(1,59)} = 0.08$, $P = .780$).

Discussion: With minimal or no training, novice nurse users of the NIHSS-PE can do as well as, if not better than, novice users of the NIHSS, making this tool useful for facilities pursuing Acute Stroke-Ready certification.

Key words: Assessment; Emergency department; Emergency nursing; Stroke care; NIHSS

The National Institutes of Health Stroke Scale (NIHSS) was designed as a research tool to measure stroke severity.[1] It was anticipated that users would be experts in stroke care, trained to use the tool, and proven proficient to ensure inter-rater reliability. Over time, the use of the NIHSS has evolved beyond academic research and has become the gold standard for clinical stroke assessment and measurement.[2–6] The NIHSS is currently used to assess stroke in the hospital and via telemedicine, as well as to consider treatment options, monitor patient status, anticipate discharge planning needs, and measure and predict patient outcomes.[3,7–13] Thus it is a valuable tool for both initial assessments of stroke severity and ongoing assessment to monitor for actionable changes in patient condition. It has become the common language for conveying stroke severity among stroke care providers.

Adoption of the NIHSS for use outside of academic and primary stroke centers has been limited for several reasons. First, the specialized neurologic terminology utilized within the tool may be unfamiliar, and therefore intimidating, to care providers with limited neurologic training or experience. This specialized neurologic terminology has been a hurdle for a wide range of users, from untrained observers to staff nurses in a stroke/neurovascular unit, who have expressed frustration with the lack of simplicity of this tool.[2,14] For infrequent users, completing the scale may require a time-consuming review of neuroterminology, even for users with previous training.

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Second, non-neurologic providers who are not confident in neurologic examination techniques, or who use the scale infrequently, may misinterpret clinical findings and therefore inaccurately score the scale. Unreliable scores that result from either of these problems may affect treatment decisions or lead to miscommunication regarding a patient's condition. Third, specialized training is required for certification to demonstrate proficiency in use of the scale, often for Stroke Center certification purposes. Online training and testing in the NIHSS, offered by the American Heart Association (AHA) or the National Institute of Neurological Disorders and Stroke (NINDS) using standard videotaped patients, takes a minimum of 55 minutes and an average of 2 hours per trainee. After initial certification, recertification is required after 12 months (with the option to recertify at 6 months), and subsequent higher level recertification is required every 12 to 24 months.[15] Compliance with this recommendation has little appeal to clinical facilities with limited training budgets and small stroke volumes. Fourth, several components of the scale have consistently proven to be mis-scored. These components include best language/aphasia, dysarthria, facial palsy, and extinction/inattention.[5,16] Despite these obstacles, the NIHSS provides the stroke community a common language by giving a numeric value to stroke severity, allowing caregivers to prognosticate, make clinical decisions, and compare scores over time.

A concerted national effort is under way to extend stroke care to rural or underserved areas, including telestroke services for providing acute stroke assessments and treatments, most recently underlined by the new Acute Stroke Ready certification now offered by The Joint Commission. This effort to extend the reach of experienced stroke providers makes it more important than ever for nonstroke experts to be able to score and communicate the NIHSS with acceptable accuracy.

In our previous study, we replaced the neuroterminology of the NIHSS with common-use vocabulary, or "Plain English," then tested the scoring with experienced nurses.[17] Compared with the NIHSS, we provided evidence that the "NIHSS in Plain English" (NIHSS-PE) was reliable and valid when used side by side by providers trained in each scale. No NIHSS examination components were deleted in the NIHSS-PE, as in other validated tools (for example, Lyden's modified NIHSS).[16,18] Our tool is also more comprehensive than other common scales, including the Scandinavian Stroke Scale. No changes were made to the NIHSS scoring system, which should allow scores to be consistent between an experienced NIHSS user and an inexperienced NIHSS-PE user. For our current study, we hypothesized that nurse providers who have no previous training in neurologic assessment or stroke scale scoring could use this simplified, validated stroke assessment tool with minimal or no training.

Methods

TOOL DEVELOPMENT

Before commencing with the current study, our original NIHSS-PE was carefully reviewed by the stroke team. Minor changes were made to the areas of best language, dysarthria, and extinction/inattention, which are problem areas for both the NIHSS and the original NIHSS-PE.[5,16,17] This finalized NIHSS-PE tool was used in the current study (Supplemental Figure).

SUBJECTS

We recruited 122 volunteer nursing students from a school of nursing. All students were preclinical, between their second and third years of nursing school, and were fluent in English. We excluded students with any experience in neurologic assessment or with any training in any stroke scale. Our expert panel consisted of 1 board-certified vascular neurologist, 1 experienced stroke nurse practitioner, and 2 experienced stroke registered nurse (RN) coordinators. This study was reviewed and approved by our Institutional Review Board (#08-79A).

STUDY DESIGN

We obtained consent from the 122 participants and randomly assigned them to 1 of 4 study groups: Trained/NIHSS, Trained/NIHSS-PE, Untrained/NIHSS, and Untrained/NIHSS-PE. All study sessions were held in a computer laboratory and were supervised by at least one of our study personnel. All subjects had their own computer with headphones, facing away from one another, so that their responses were private.

The Trained/NIH + SS group watched the standard 55-minute NINDS NIHSS training DVD. The Trained/NIHSS-PE group watched a 13-minute narrated PowerPoint educational presentation on the NIHSS-PE that was developed by our team. Both Untrained/NIHSS and Untrained/NIHSS-PE groups received no training in stroke assessment. All 4 groups then rated videotaped patients from the NINDS NIHSS Certification DVD, a common assessment for NIHSS certification at certified stroke centers. The NIHSS groups scored patients using the traditional NIHSS form, and the NIHSS-PE groups scored patients using the NIHSS-PE form. Patients 1, 3, and 5 from the NINDS certification disk 2—group A—were selected as the study patients, because they had mild to