Validation of Instruments for Older Hospitalized Patients At Risk for Functional Decline

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Purpose: The study aims at examining the reliability and validity of the following three assessment instruments commonly used in Taiwan to predict functional decline among hospitalized elderly: Identification of Seniors at Risk-Hospitalized Patients (ISAR-HP), Variable Indicative of Placement Risk (VIP), and Hospital Score for the Evaluation of the Risk of Loss of Autonomy (SHERPA).

Methods: Research design: A longitudinal study. Sampling: Convenience sampling. Research subjects: Elderly inpatients at the internal medicine ward of a teaching hospital in central Taiwan. Research Instruments: demographic information, Barthel Index, ISAR-HP, VIP, and SHERPA. Data Collection: Research data were collected twice, first during the assessment conducted 48 hours after hospitalization and then through the telephone interview performed one month after discharge from hospital. Definition of “Functional Decline”: research subjects were regarded as having experienced functional decline if their inability to perform ADL (activity of daily living) increased at least one more item as assessed by the Barthel Index one month after discharge from hospital. Validation of Instruments: Test-retest reliability, predictive validity, concurrent validity, sensitivity, specificity, and ROC (receiver operating characteristic) curve of the adopted instruments were examined and analyzed to verify their effectiveness.

Results: Of the 197 recruited subjects, 77 (39.1%) appeared to have experienced functional decline (the “FD group”), while the remaining 120 (60.9%) showed no sign of functional decline (the “non-FD group”). Significant differences between the two groups were noted in items like age, muscular strength, ADL, cognitive function, and self-reported health perception; no significant difference was observed elsewhere.

1. Reliability Analysis: Pearson’s correlation coefficients were calculated to assess the test-retest reliability of ISAR-HP, VIP, and SHERPA, and the results respectively $r = .988$, $r = .950$, and $r = .931$ ($p < .001$), indicated solid test-retest reliability and consistency of all three instruments.

2. Validity Analysis: According to the results of the independent sample t-test conducted to examine predictive validity, the average scores of both the FD group and the non-FD group by ISAR-HP, VIP, and SHERPA all demonstrated significant differences (respectively 2.83 vs. 4.55, $t = -8.72$; 1.25 vs. 2.32, $t = -7.86$; and 4.47 vs. 7.35, $t = -7.49$; $p < .001$). Pearson’s correlation coefficients were further adopted to verify the concurrent validity of the three instruments and the Barthel Index with the results indicating a moderate level of negative correlation between each of the assessed instruments (ISAR-HP, VIP, SHERPA) and the Barthel Index ($r = -.675$, $r = -.781$, and $r = -.676$; $p < .001$).

3. ROC Curve Analysis: The best cut-off point of ISAR-HP read 2.5 and its sensitivity, specificity, and AUC (area under the curve) were respectively 96.1, 52.5, and 0.751. The best cut-off point of VIP read 1.5 and its sensitivity, specificity, and AUC were respectively 83.1, 62.5, and 0.761. The best cut-off point of SHERPA read 4.75 and its sensitivity, specificity, and AUC were respectively 89.6, 54.2, and 0.758. VIP emerged to be better in terms of predictive power, followed respectively by SHERPA and ISAR-HP.

Conclusion: According to the study results, ISAR-HP, VIP, and SHERPA are all marked with fine test-retest reliability, predictive validity, and concurrent validity; all three instruments also report acceptable predictive power as indicated by their best cut-off points. The study results can be expected to provide reference for facilitating choice and use of proper instruments for predicting functional decline among hospitalized elderly patients in a clinical setting.
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Keywords:
Functional decline, Older hospitalized patients and Validation of instruments

References:


Abstract Summary:
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Content Outline:
Background: Functional decline and increased dependence on others are common problems among hospitalized elderly patients. Literature review finds most of the papers on functional decline in the elderly population in Taiwan focus on intervention approaches. Studies directing attention to the development of assessment instruments for predicting functional decline among hospitalized elderly patients or examination of the reliability and validity of existing instruments remain rare.

Purpose: The study aims at examining the reliability and validity of the following three assessment instruments commonly used in Taiwan to predict functional decline among hospitalized elderly: Identification of Seniors at Risk-Hospitalized Patients (ISAR-HP), Variable Indicative of Placement Risk (VIP), and Hospital Score for the Evaluation of the Risk of Loss of Autonomy (SHERPA).

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predictive validity, concurrent validity, sensitivity, specificity, and ROC (receiver operating characteristic) curve of the adopted instruments were examined and analyzed to verify their effectiveness.

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1. **Reliability Analysis**: Pearson’s correlation coefficients were calculated to assess the test-retest reliability of ISAR-HP, VIP, and SHERPA, and the results respectively \( r = .988 \), \( r = .950 \), and \( r = .931 \) \( (p < .001) \), indicated solid test-retest reliability and consistency of all three instruments.

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3. **ROC Curve Analysis**: The best cut-off point of ISAR-HP read 2.5 and its sensitivity, specificity, and AUC (area under the curve) were respectively 96.1, 52.5, and 0.751. The best cut-off point of VIP read 1.5 and its sensitivity, specificity, and AUC were respectively 83.1, 62.5, and 0.761. The best cut-off point of SHERPA read 4.75 and its sensitivity, specificity, and AUC were respectively 89.6, 54.2, and 0.758. VIP emerged to be better in terms of predictive power, followed respectively by SHERPA and ISAR-HP.

**Conclusion and Suggestion**: According to the study results, ISAR-HP, VIP, and SHERPA are all marked with fine test-retest reliability, predictive validity, and concurrent validity; all three instruments also report acceptable predictive power as indicated by their best cut-off points. The study results can be expected to provide reference for facilitating choice and use of proper instruments for predicting functional decline among hospitalized elderly patients in a clinical setting.

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**Author Summary**: Mei-Chun Wang has been a nurse in emergency room for 11 years and Pediatric ward for more than 1 year. Her working field includes pediatric ward and nursing administration and management.

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