MAE4011 PoM :: Paper Presentation

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Validation of the Minimum Data Set Cognitive Performance Scale: Agreement with the Mini-Mental State Examination

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introduction

- **Cognitive impairment**, particularly dementia of the Alzheimer's type, is a major problem in nursing homes across the United States
- By law. required to assess each resident's **functional, medical, psychosocial, and cognitive status**
- standard instrument known as the Minimum Data Set (MDS) is used

Problem with current use of MDS

- The structure of the MDS calls for clinical professionals (e.g., nurses, social workers, therapists) to directly observe and assess resident performance over all shifts during a specified time period

- For cognitive status, 7 direct and A number of indirect measures generally unfeasible for use in nursing home populations due to their:
  - (a) excessive length,
  - (b) need COGNITIVE PERFORMANCE SCALE VALIDATION for highly skilled personnel for administration, and
  - (c) excessive administration costs.
- **Cognitive Performance Scale (CPS) is developed as a new assessment method**

The paper presented

- Validition of MDS -CPS
- against the Mini-Mental State Examination (MMSE), a popular clinical measure of cognitive functioning.

Methodology

- **Subject-** a random sample of 200 residents recruited from 8 nursing home facilities in North Carolina.
- **Facitlities** situated within a range of 1-h driving distance from a center-point
- **Instruments and Data Collection:**
  - CPS & MMSE
  - on-site data collection at the same-time point
  - Each resident was assessed once on the MMSE by medical students
  - geriatric research nurse was responsible for collecting the selected MDS cognitive items, which included the 5 items required for generating CPS scores.

Relationship/difference

CPS

- 5 selected MDS cognitive items
  - comatose status, short-term memory, ability to make decisions, making self understood, and eating performance
- 7-point rating scale
  - 0 (no impairment)
  - 1
  - 2
  - 3
  - 4
  - 5
  - to 6 (very severe impairment)

- Regular staff can administer

MMSE: "gold standard"

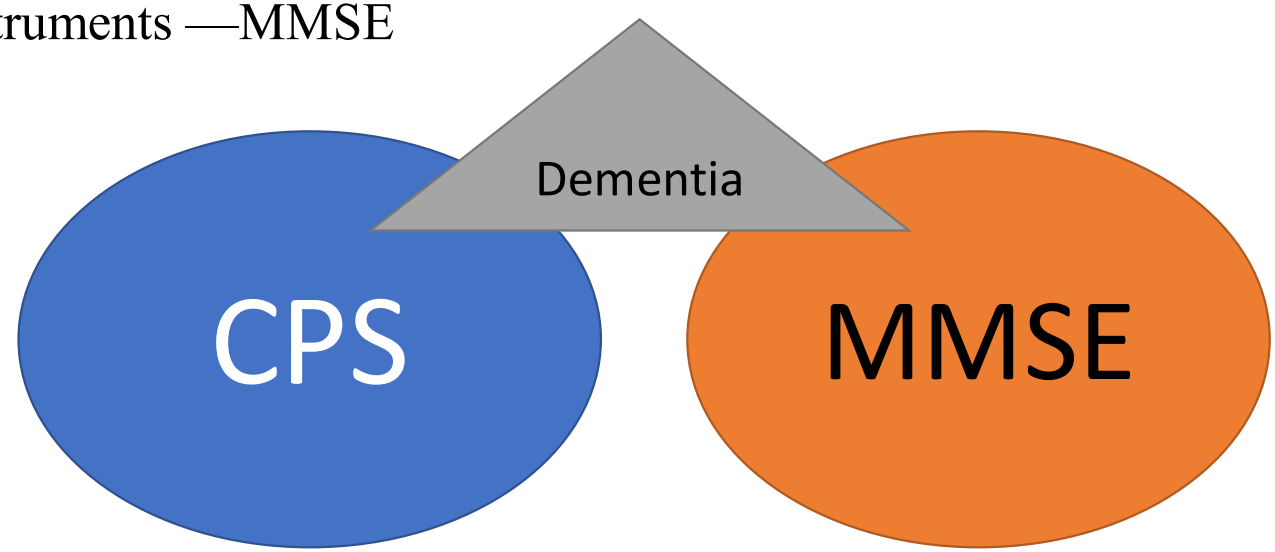
- consisting of 22 questions and requiring approximately 10-15 minutes to administer
- Scores range from 0 (worst) to 30 (perfect).
  - 0-17- SEVERE COGNITIVE IMPAIRMENT
  - 18-23- Mild
  - 24-30- No impairment

- Cognitive Performance Scale (CPS)is Stratified on Education Level
  - <= 23 + greater than grade 8 and
  - <= 17 + <= grade 8
- were classified as cognitively impaired

- **Need medical professional to administer**

Validation procedure

- **Evidence based on relations to other variables**
  - Modeling of the CPS was based on two standard cognitive assessment instruments —MMSE



categorization of the validation procedures

- Convergent evidence:
  - CPS was intended to measure construct- Dimentia (cognitive impairment) that is exhibited by strong relationships with MMSE (e.g., correlation coefficients).

- Test-criterion relationships:
  - How accurately do test scores predict criterion performance?
  - **Concurrent evidence**: Obtained test- and criterion information at about the same time.

results and evaluation of the validity

- Spearman **correlation**:
  - r = -.863 (p < .001)
- **Sensitivity and specificity**
  - Overall, adjusting for education level, sensitivity and specificity measures for the CPS compared with the MMSE were both .94
- **Kappa coefficients** of reproducibility- correct chance agreement
  - Adjusting for education level, agreement between the CPS and MMSE was k = .82 (95% CI: .68, .96).
- The area under the **ROC curve**. (true pos vs false pos)
  - to evaluate the diagnostic accuracy of the CPS in correctly identifying cognitively impaired from cognitively intact subjects as defined by the MMSE
  - 0.96%- excellent.
- **Positive and negative predictive values**
  - Prevalence of a positive diagnosis (impaired = yes) and negative diagnosis (impaired = no) was 76% and 24%, respectively.

Concluding remarks

- To me, it's a good example of construct validation
- However
  - **Randomization** of sample is still in question- should consider more and diverse subjects
  - Paper motioned to **model** CPS with another standard method Test for Severe Impairment (**TSI**)- but no data has been provided.
  - **Validity generalization**: missing
    - Does evidence from this validation generalize to another?
    - Do we need to re-validate interpretations and uses every time?