A mixed prospective comparative analysis of MoCA vs. SLUMS in an outpatient based Geriatric resource team

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BACKGROUND

The mandatory certification requirement for the use of Montreal Cognitive Assessment (MoCA) questionnaire, has presented healthcare personnel with a new challenge in finding an accessible, equally sensitive and free to use tool, that can screen for executive functions and cognitive performance.

To date, no study has compared the St. Louis University Mental Status (SLUMS) questionnaire to MoCA in its ability to screen for cognitive deficits.

TABLE 1. Domains of cognitive impairment

Domain	Example of related skill
Learning and memory	Short-term recall, long-term recall, semantic memory, autobiographical memory
Language	Object naming, word finding, use of speech
Complex attention	Sustained attention, selective attention
Executive function	Planning, flexibility, working memory, decision making
Perceptual/motor	Visual perception skills, coordination of activity
Social cognition	Recognition and regulation of emotions, appropriateness of behavior

SLU Mental Status Examination Tool

What does the SLU Mental Status Exam Test Do?
- Q1-Q3: Attention, immediate recall, and orientation
- Q4 and Q7: Delayed recall with interference
- Q5: Numeric calculation and registration
- Q6: Memory; immediate recall with interference (time constraint)
- Q8: Registration and digit span
- Q9: Visual spatial
- Q10: Visual spatial and executive function
- Q11: Executive function plus extrapolation

Figure 1: SLU mental status exam

Sharma et. Al, 2018

TABLE 2. Comparison of cognitive screening tools

Test	Scoring	Cut-off point	Other notes
MMSE	11 items; 0 - 30	> 24	Most widely used; designed for those fluent in English and with a grade 8 education[a]
Mini Cog	3 items + clock	0 - 2	High sensitivity and specificity, very fast to administer[a]
CDT	10 points	Normal clock; absence of dementia; abnormal clock warrants referral	3 minutes to administer, high reliability[a]
SLUMS	30 points	27 - 30 considered normal score in a person with a high school education; scores between 21 and 26 suggest mild neurocognitive disorder; scores between 0 and 20 indicate dementia	Effective at screening for executive function domain[a] *In <Gr12, adjusted scores are 25-30, 20-24, and 1-19, respectively
MoCA	Possible 30 points, 8 domains tested	< 26	Performs well with respect to test/retest reliability and internal consistency[a]
		**In ≤Gr12, 1+point	
AMT	10 items	8	Simple to administer and score, limited validity data[a]
RUDAS	6 items	< 22 indicate impairment	Designed to minimize the effects of cultural learning and language diversity[a]

MMSE, Mini Mental State Examination; CDT, Clock Drawing Test; SLUMS, St. Louis University Mental Status; MoCA, Montreal Cognitive Assessment; AMT, Abbreviated Mental Test; RUDAS, Rowland Universal Dementia Assessment Scale.

Sharma et al, 2018

** In MOCA break down is 26-30, 19-25, 1-18 for Normal, mild cognitive impairment and dementia; respectively.

AIMS

An ideal cognitive screening tool is one that:
1. evaluates impairments in all cognitive domains regardless of etiology.
2. Possess both high Sensitivity and Specificity
3. Has strong inter-rater reliability
4. Both time and cost-effective.

We aimed to assess whether SLUMS may be a reliable tool when compared to MoCA in identifying neurocognitive disorders.
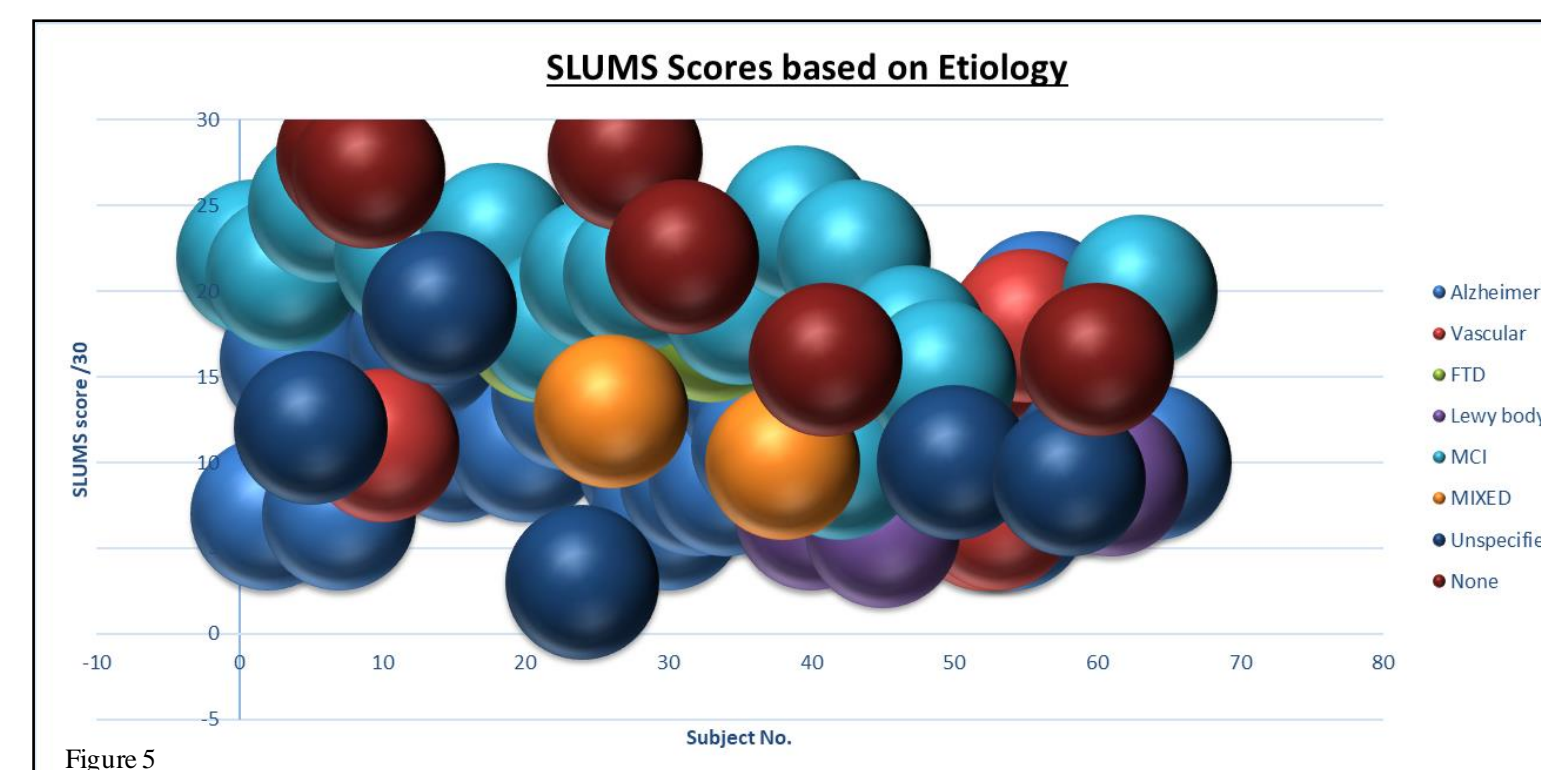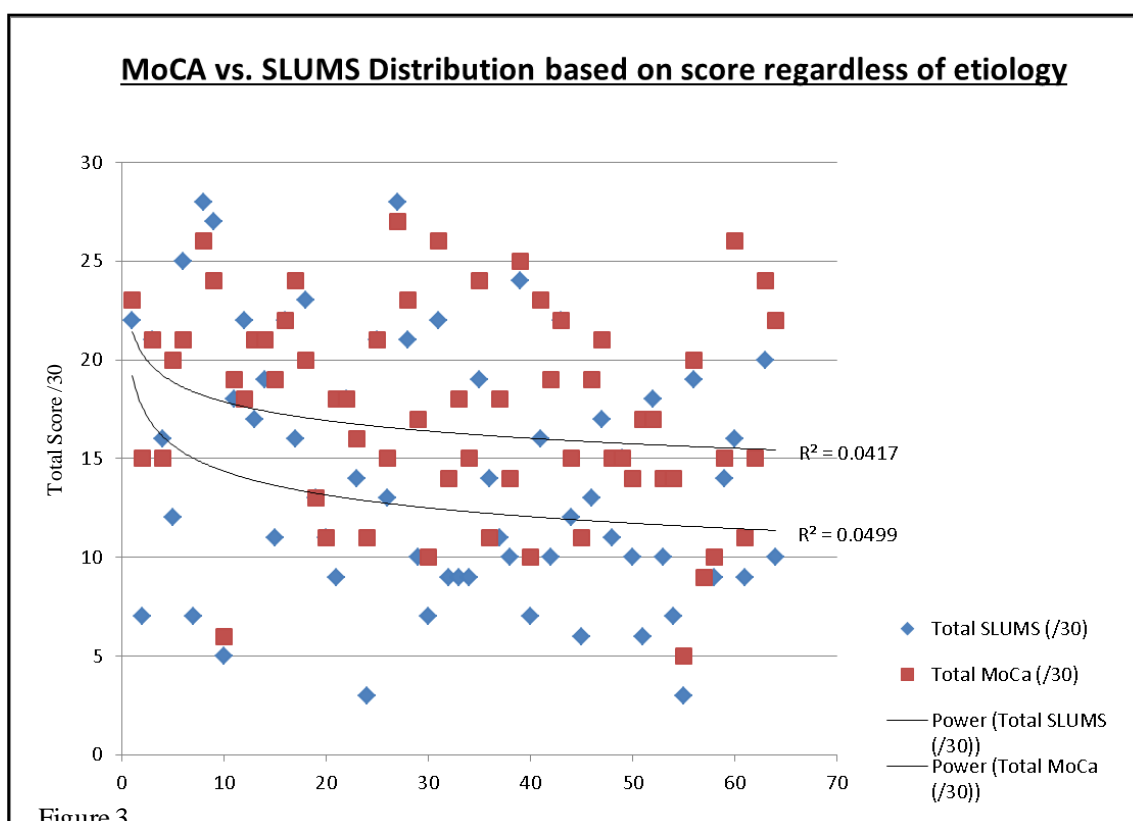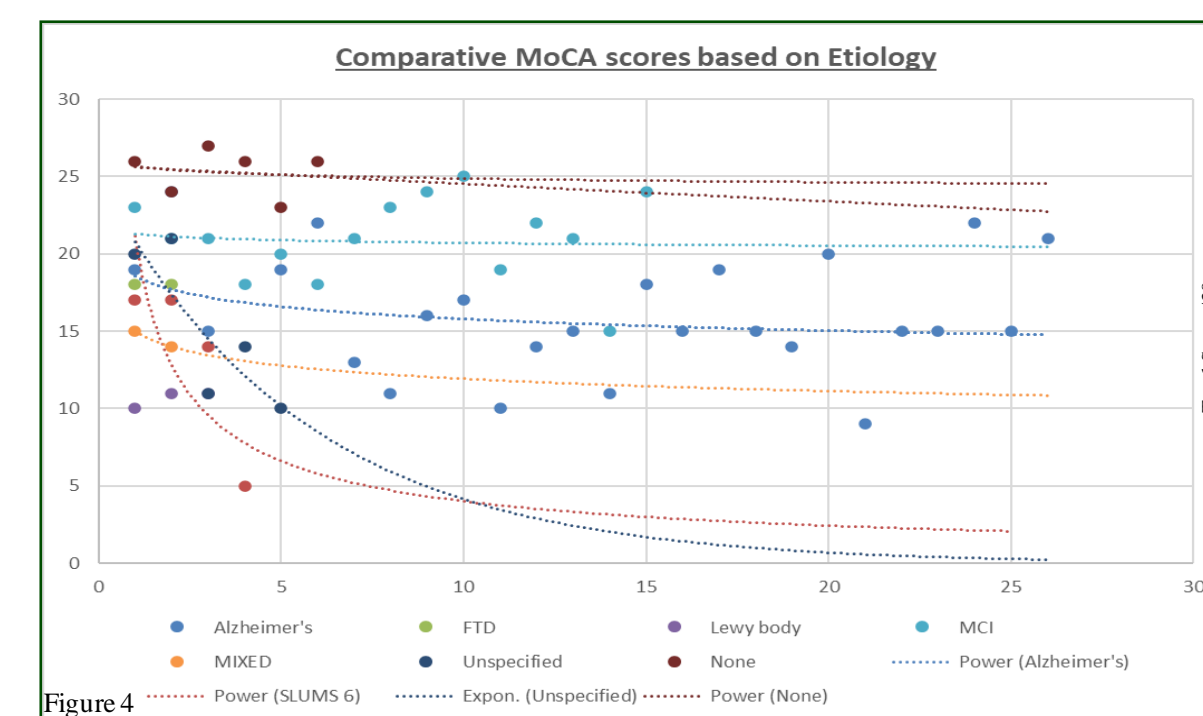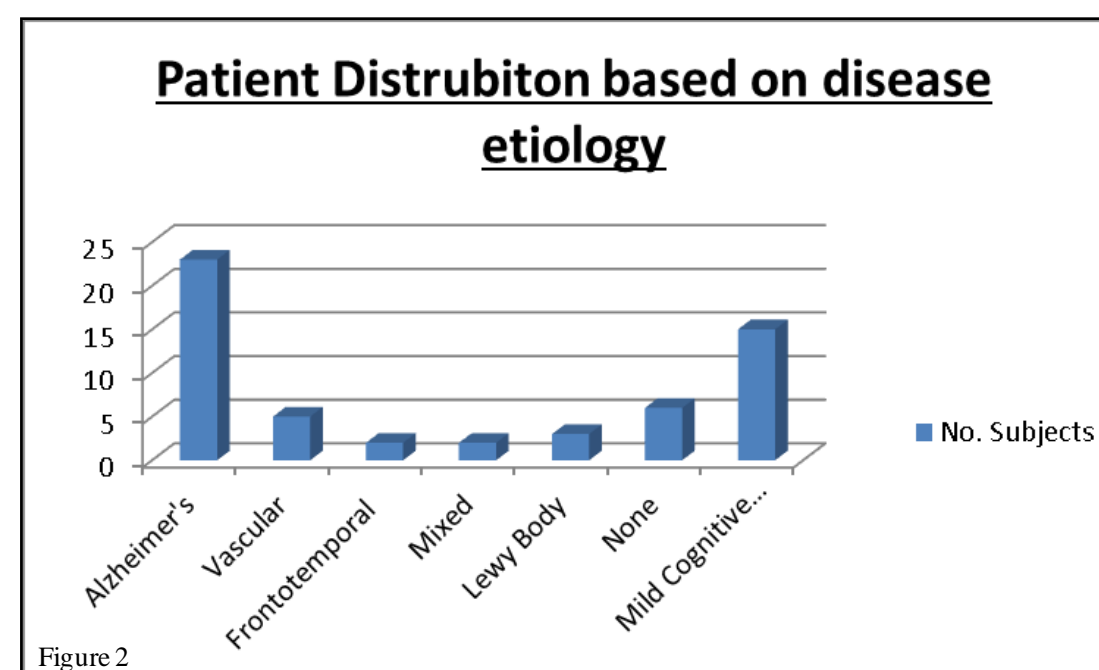
METHODS

- Prospective-retrospective mixed study model,
- Patients referred for an initial neurocognitive assessment underwent screening with MoCA and SLUMS no more than one month apart.
- Using the original score cut-offs for SLUMS and MoCA, patients were grouped in one of three diagnostic categories:
  - normal, mild cognitive impairment, Dementia.
  - A neurocognitive diagnosis (& etiology) was given based on a multidisciplinary team assessment.
- Total scores, as well as the individual domains in each screening tools were compared to each other.

RESULTS

- Age: Mean = 80.1 years (standard deviation = 6.9)
- Gender: 42 females; 19 males
- Marital status:
  - Married, n = 27; Divorced, n = 2; Widowed, n = 25; Unknown, n = 7
- Average SLUMS total score/30: 14.5 (± 6.4)
- Average MoCA total score/30: 17.7 (± 5.1)

- The same diagnosis was made in 43 out of 61 cases (**70.5% - kappa coefficient = .42**) indicating a **moderate level of agreement**.
- Furthermore, an intraclass correlation coefficient (ICC) of .79 suggests good reliability between the two scales.

Table 3

Class of NCD	No. Subjects
Alzheimer's	23
Vascular	5
Frontotemporal	2
Mixed	2
Lewy Body	3
None	6
Mild Cognitive Impairment	15

Figure 2 Patient Distribution based on disease etiology

Figure 4 Comparative MoCA scores based on Etiology

Figure 3 MoCA vs. SLUMS Distribution based on score regardless of etiology

Figure 5 SLUMS Scores based on Etiology

CONCLUSION

SLUMS is a potential economical and user-friendly screening tool for neurocognitive disorders that provides **good reliability** and **moderate** level of agreement in comparison to the current gold standard of the MoCA.

DISCUSSION

Key Features of SLUMS

- The SLUMS is a 30-point, 11 question screening questionnaire that tests orientation, memory, attention, and executive function, with items such as animal naming, digit span, figure recognition, clock drawing and size differentiation.
- The measure is clinician-administered and takes approximately 7 minutes to complete.
- The maximum score is 30 points, with the point values for correct answers written on the exam for easy scoring.
- Cut-off scores for dementia or mild neurocognitive impairment are based on the education level of the patient (high school and above or less than high school).

https://www.sralab.org/rehabilitation-measures/saint-louis-university-mental-status-exam

Limitations:
- Presence of anxiety, aphasia, or other physical limitation contributed to poor scoring on either SLUMS or MoCA as compared to clinical impression.
- Time elapsed between SLUMS and MoCA administration varied between patients.
- Small number of patients.

REFERENCES

1. *Tools and tips for assessing cognition in older adults: Issues for psychiatrists*. Psychiatric Times. (n.d.). Retrieved November 1, 2021, from https://www.psychiatrictimes.com/view/tools-and-tips-assessing-cognition-older-adults-issues-psychiatrists.
2. *SLU mental status exam*. SLU. (n.d.). Retrieved November 1, 2021, from https://www.slu.edu/medicine/internal-medicine/geriatric-medicine/aging-successfully/assessment-tools/mental-status-exam.php.
3. *Cognitive assessment*. MoCA. (2021, July 21). Retrieved November 1, 2021, from https://www.mocatest.org/.
4. *Saint Louis University Mental Status Exam*. Shirley Ryan AbilityLab. (n.d.). Retrieved November 1, 2021, from https://www.sralab.org/rehabilitation-measures/saint-louis-university-mental-status-exam.

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