

Title: Validity of the InterRAI outcome scales for older adults in specialist mental health services

Student: Alex Barron

Supervisor(s): Susan Gee, Matthew Croucher, Jason Elley

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Introduction: Depression and dementia are common mental health problems in later life which can often go undiagnosed. Robust, reliable measures for dementia and depression in older people are vital for ensuring technical identification of new cases.

New Zealand has recently mandated the use of InterRAI, a comprehensive assessment tool designed to identify the needs of elderly people to develop tailor made care plans. The InterRAI was originally designed for use in nursing homes but now other versions are available. The "home-care" version is being used to assess the needs of community care patients in several DHBs. Embedded within the InterRAI are several outcome scales which determine a score for a specific area of assessment of particular interest by compiling the answers from several questions. Two of these scales are the cognitive performance scale (CPS), which assesses mental functioning, and the depression rating scale (DRS), which assesses depressed mood.

Because these data are routinely collected, these scales could possibly be used as screening tools for dementia and depression. There is very little research on either scale, particularly in community samples. Initial studies on the CPS delivered promising results but more recent studies are at odds with each other and indicate a lower overall validity. Studies that have examined the DRS indicated that it did not perform very well. However these studies used a 30 day period for mood questions which may be problematic for people with memory problems, whereas the New Zealand version of InterRAI elicits data covering a 3 day interval. Before this study, there were no New Zealand studies on the effectiveness of these scales in a New Zealand population.

Aims: The aims of this study were to assess the validity of the CPS and DRS in a sample of community-dwelling New Zealanders who use psychiatry of old age services and also to determine if the DRS could be improved by including additional InterRAI items.

Methods: Records of patients who were discharged from acute specialist psychogeriatric inpatient units and memory clinics in Canterbury DHB and Auckland DHB who had recently had an InterRAI assessment were examined to determine if diagnoses of dementia and depression had been made. These specialist diagnoses were used as a gold standard to determine the accuracy of the CPS and DRS. Boundary cases were discussed with a consultant psychiatrist of old age for conservative categorisation. The scales were also compared HoNOS 65+ questions which measure cognitive problems and depressed mood; this is also a mandated outcome measurement tool in New Zealand. Data from the subset of participants who had Addenbrooke's Cognitive Examination - Revised (ACE-R) scores was also used for comparison with CPS; this is a validated cognitive performance screening tool.

Results: For the CPS analyses, participants were included if their InterRAI assessment was 90 days either side of their discharge from psychogeriatric services, providing a sample of 134. 72 participants had clinical a diagnosis of dementia. Of these 72, the CPS detected that 65 were cognitively impaired (sensitivity = 90.3%). Of the 62 participants that were considered to not have dementia, the CPS only determined 37 to not have dementia (specificity = 59.7%). The CPS was moderately correlated with

HoNOS65+ ($\rho = 0.556$) and ACE-R ($\rho = -0.509$), that is, people with CPS scores indicating impairment tended to also have scores that indicated impairment on these scales.

For the DRS, a 14 day cut off was used instead of 90 days, because depression symptoms can vary more rapidly than dementia symptoms, providing a sample of 92. 35 participants (38%) had significant depressed mood. Of these 35, the DRS detected that 21 were depressed (sensitivity = 60%). Of the 57 who did not have depressed mood symptoms, the DRS determined 40 to not have depressed mood (specificity = 70.2%). The DRS correlated very poorly with the HoNOS 65+ depression question ($\rho = 0.317$), however the HoNOS 65+ question was only slightly more accurate at detecting depression than the DRS. Analyses were repeated, including extra depression-related questions from the InterRAI with reasonable face validity to determine if the DRS could be improved but these showed no improvement in the scale's performance.

Conclusion: Overall, the CPS was good at detecting when people who had required specialist psychiatric service input did have a dementia syndrome (high sensitivity) but was poorer at identifying those people did not have dementia (moderate specificity). This suggests that the CPS may be a reasonable supplementary screening tool if the aim is to identify as many cases as possible so they can be "red flagged" and referred for diagnostic assessment. However, these results were at odds with previous research where the CPS was found to have high specificity and low sensitivity. It is possible that sensitivity was high due to the particular sample used in this study: the participants were recruited from psychogeriatric inpatient and memory clinic services so the assessors, carers and the patients themselves may have been more aware of their cognitive functioning. The DRS was found to have low validity overall in in this sample, in line with previous research on the scale, and our efforts to improve the scale by adding additional questions from the InterRAI were not successful.

This study allows us to make some cautious recommendations in respect of the use of these InterRAI outcome scales. The CPS may have potential as a screening tool to "red flag" community care patients that should be referred for a comprehensive cognitive assessment. However, caution should be exercised especially for "negative" findings and because the CPS may not perform as effectively in an outpatient population. The DRS has not performed well enough to be used as a screening tool and we do not recommend its use in this regard.

Because InterRAI data is routinely collected, another possible application for the scale would be to estimate the prevalence of dementia or depression in a population without the need for administering a separate test. However, we are not confident in the accuracy of the scales to recommend their use in this regard.

We did not examine the scales' sensitivity to change (can the scales detect changes over time?) or inter-rater reliability (do different people administering the test get the same result?). These could be areas of interest for further research.