

THE REVISED URINARY INCONTINENCE SCALE: A COMPARISON WITH OTHER SHORT URINARY INCONTINENCE MEASURES

Hypothesis / aims of study

The Revised Urinary Incontinence Scale (RUIS) contains 5 items drawn from the Urogenital Distress Inventory-6 (UDI-6) and the Incontinence Severity Index (ISI). Selection of the RUIS items was based on the examination of the psychometric properties of the items within these scales (1) in a large community survey (N = 2915). The RUIS was developed to provide a short, psychometrically sound measure for both epidemiological and outcomes research. The RUIS consists of the following self report items:

1. *Urine leakage related to the feeling of urgency*
2. *Urine leakage related to physical activity, coughing or sneezing*
3. *Small amounts of urine leakage (drops)*
4. *How often do you experience urine leakage?*
5. *How much urine do you lose each time?*

Scoring is by simple summation and the range is 0-16 with 0 indicating no incontinence.

As part of the clinical validation of the RUIS this study aims to provide comparisons with other short scales used to assess urinary incontinence: the International Consultation of Incontinence – Short Form (ICIQ-SF) scale, the UDI-6 and the ISI.

Study design, materials and methods

A sample of 195 consecutive patients were recruited and administered questionnaires pre and post-treatment (Continence Advising, Physiotherapy and Surgery) at 7 incontinence clinics across Australia. Approximately 80% of patients approached enrolled in the study. Study eligibility criteria were; attending a clinic to receive treatment for urinary incontinence, age from 18-85 years, and of sufficient English fluency to complete a self-report questionnaire. Based on baseline (recruitment, pre-treatment) and follow up (3 months post treatment), and an assumed effect size of 0.5 on the RUIS where the test size was 0.05, power set at 0.80, the calculated sample size was 84 cases. One hundred participants also completed the post-treatment survey. Sixty participants also completed a retest survey 2 weeks after the completion of their post-treatment surveys. Measures included the RUIS; ICIQ-SF; the UDI-6 and the ISI. Additionally, diagnostic information, clinician and patient ratings of severity and improvement were collected.

Results

Instrument scores at baseline were compared with other clinical variables. All instrument scores showed significant differences ($p = 0.000$) in relation to clinician rated severity at baseline but the RUIS showed the most discrimination. Similarly all instruments showed significant differences in relation to patient rated severity ($p = 0.000$) but the most sensitive instrument for patient rated severity was the ICIQ-SF followed by the RUIS.

The RUIS and the UDI-6 were the most sensitive instruments for discriminating differences by incontinence type ($p = 0.000$). The ICIQ-SF was slightly less sensitive and the ISI did not show differences in scores by incontinence type ($p = 0.180$). The mean RUIS scores were significantly higher ($p = 0.007$) for those that were receiving surgical vs. conservative treatments – generally surgery is used with patients with more severe incontinence, or for whom conservative treatment has failed. This was also true for the ICIQ-SF ($p = 0.020$) but not for the ISI and UDI-6 ($p > 0.05$). With regard to double incontinence the UDI-6, the ISI and RUIS showed a significant difference between those with both urinary and faecal incontinence as against those with only urinary incontinence but this difference was not significant for the ICIQ-SF ($p = 0.170$). All instruments discriminated significantly ($p < 0.01$) by levels of pad use.

In clinical settings at pre-treatment the internal consistency reliability of the RUIS had a Cronbach's alpha = 0.73 whereas alpha levels of 0.65 were reported for the UDI-6 and the ICIQ-SF scales and 0.54 for the ISI. Test-retest reliability alpha levels were 0.77, 0.74, 0.67 and 0.76, respectively.

There was significant improvement in scores for all scales following treatment. For all scales a reduction in scores equates to an improvement in incontinence status. All instruments were responsive over time. Kazis' effect size (ES) is change measured in units of the standard deviation of the baseline distribution and an ES over 1 is considered very large. The effect sizes were RUIS = -1.32, UDI-6 = -1.02, ICIQ-SF = -0.89 and ISI = -0.82. Relative efficiency (RE) is commonly used to compare the relative abilities of instruments to detect differences between groups known to be different. RE is the ratio of the squares of the t statistic where in each case the comparator used is the ISI as the least sensitive measure. The relative efficiency of the measures was ISI = 1.00, ICIQ-SF = 1.19, RUIS = 1.66, and UDI-6 = 1.83.

Pre-treatment correlations between the instruments were: RUIS and UDI-6 $r = 0.76$ ($p < 0.01$); RUIS and ISI $r = 0.76$ ($p < 0.01$); RUIS and ICIQ-SF $r = 0.74$ ($p < 0.01$); RUIS and WEI (urinary) Incontinence Symptom Index $r = 0.72$ ($p < 0.01$); RUIS and WEI Bother Index $r = 0.66$; RUIS and Incontinence Impact Questionnaire $r = 0.53$ ($p < 0.01$).

At pre-treatment the RUIS correlation with the Physical Function Scale of the SF-36V2 was $r = -0.15$ ($p = 0.039$). The RUIS correlation with the untransformed Short Assessment of Patient Satisfaction (2) scores was $r = -0.44$ ($p < 0.01$).

Interpretation of results

All scales discriminated well in relation to clinician and patient ratings of severity and pad use. The RUIS and the UDI-6 were more sensitive to discriminating differences by incontinence type and the presence of double incontinence. The RUIS and the ICIQ-SF were more sensitive to discriminating differences by treatment type (conservative/surgical). All instruments were responsive to change arising from treatment; however, the RUIS and the UDI-6 were the instruments most sensitive to change.

In clinical samples the RUIS had adequate internal consistency reliability ($r > 0.70$) whereas all the other measures would be assessed as having marginal or inadequate reliability. Studies (2, 3) have indicated higher alphas (0.78-0.91) for all instruments in population settings where there are more homogenous samples. However, it is important that instruments have adequate reliability in clinical settings if they are to be used for assessment and outcomes evaluation. The test-retest reliability of the RUIS, the UDI-6 and the ISI were adequate.

The correlations between the RUIS and other urinary incontinence measures were significant and in the expected directions providing validation for this measure. With regard to health related quality of life the RUIS has a low negative correlation with Physical Function Index of the SF-36V2 which is consistent with findings in the literature. There was an association between higher RUIS scores (reflecting greater incontinence post-treatment) and lower patient satisfaction scores.

Analyses of patients with post forms as against those with only pre-treatment forms indicated there were no significant differences at baseline on RUIS scores, patient assessed incontinence severity, age group, gender, educational background, the number of co morbidities and body mass index.

Concluding message

The RUIS possessed evaluative discrimination between different levels of incontinence severity and performed well compared with other measures. It had superior reliability and was equivalent or superior to detecting change in incontinence status following treatment. It is a short, reliable and valid scale which could be considered by researchers, epidemiologists and clinicians.

References

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Disclosures

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