

THE ASSESSMENT OF TWO BRIEF, SELF-REPORT MEASURES OF URINARY INCONTINENCE: RESULTS FROM A COMMUNITY POPULATION SURVEY

Hypothesis / aims of study

Recently two brief, self-report measures of urinary incontinence (UDI-6, ISI) were included in a community population survey (N=3015). The purpose of including these scales was to obtain current prevalence estimates for urinary incontinence in our country and to examine the psychometric properties of these scales and their items.

Study design, materials and methods

A recent project which reviewed assessment and outcome measures recommended a number of urinary incontinence measures to be used by clinicians and researchers in our country. Among the recommended urinary incontinence symptom measures were the brief self-report instruments, the Incontinence Severity Index (ISI)(1) and the Urogenital Distress Inventory (UDI-6)(2). The ISI asks two questions about urinary incontinence leakage (frequency * amount) producing a 3 or 4 level severity index. The UDI-6 is a short version of a larger symptom inventory and consists of 6 items asking about the experience and bothersomeness of urogenital symptoms associated with urinary incontinence.

Both measures were assessed as having appropriate reliability, validity and practicality, especially in primary care and community / public health settings. One way to further assess their applicability to our country and their psychometric properties was to examine their performance in a community field survey. This randomly selected and representative household survey obtained health and continence information from 3015 men and women, aged 15 years and over. The dataset was then subjected to a standard psychometric analysis to examine the item properties of the ISI and UDI-6. These included: prevalence data, item endorsement and discrimination, item-total correlations and internal consistency reliability, as well as Exploratory Factor Analysis (EFA) and Item Response Theory (IRT) approaches. EFA attempts to describe the relationships between individual items, by looking for a smaller number of common elements or factors; while IRT approaches use mathematical modelling to provide an in depth analysis of the items in relationship to the underlying condition. IRT is often used to find the model with the best fit to the data within the minimum number of items and it is a process commonly used to shorten scales.

Results

Key findings of this psychometric analysis include:

(1) Examining the prevalence estimates based on the two measures, one finds a wide disparity. The self-reported prevalence of any urinary incontinence symptoms in the community, as measured by the ISI is 24%. For females it is 38% (95%CI: 36 - 41%) and 10% for males (95%CI: 9 - 12%). In contrast the prevalence estimate of self-reported urinary incontinence symptoms using the UDI-6 would be 47%. For females it is 60% (95%CI: 58 - 63%) and 33% for males (95%CI: 30 - 35%). Obviously some of this disparity in the prevalence estimates may be explained by the fact that ISI items are only concerned with urinary leakage whereas UDI items cover a broader range of symptoms associated with urinary incontinence. However, the finding that a number of these symptom items are endorsed by people who do not experience urinary leakage would suggest that such items may lead to inflated prevalence estimates. This would also suggest that some of these items (e.g. pain in the lower abdominal region) may not be sufficiently specific to urinary incontinence for them to be included as items in outcome measures without further modification.

(2) Internal consistency reliability (Cronbach's Alpha) for both scales was in the acceptable range (UDI-6 = 0.78 and ISI = 0.83). However, some items of the UDI-6 (emptying bladder and pain lower abdominal) had poor item-total correlations for this population, suggesting they could be removed without affecting the scales internal consistency reliability (see Table 1 for further details). While the ISI has good measurement properties, classical test theory recommends that at least 3 items are needed for stable measurement interpretation.

Table 1: Corrected Item - Total Correlations and Cronbach's Alpha if the item was deleted for each item of the UDI-6

Item	Corrected - Item Total Correlation	Cronbach's Alpha if Item Deleted
Frequent Urination	0.56	0.75
Urgency Leakage	0.70	0.70
Stress Leakage	0.57	0.73
Leak Small Amount	0.69	0.71
Emptying Bladder	0.37	0.78
Pain Lower Abdominal	0.32	0.79

(3) The exploratory factor analysis of the items produced a 2 factor structure, explaining 67% of the variance and representing an acceptable solution (3). Most items (UDI-6:- urgency leakage, stress leakage, and leak small amount; ISI: - leakage frequency and leakage amount) loaded on the first common factor, which seemed to be defined by the issue of urinary leakage symptoms. The second factor was made up of the UDI-6 items emptying bladder and pain

lower abdominal, and this factor seems to reflect other urological symptoms. (The UDI-6 item on frequent urination loaded equally on both factors)

Interpretation of results

Following this standard psychometric analysis of community survey data, a five item scale, targeting the issue of urinary leakage was developed by combining the most useful items from these scales. This was labelled the Revised Urinary Incontinence Scale (RUIS) and contained the following items:

1. Urine leakage related to the feeling of urgency (UDI-6)*
 2. Urine leakage related to physical activity, coughing or sneezing (UDI-6)
 3. Small amounts of urine leakage (drops) (UDI-6)*
 4. How often do you experience urine leakage? (ISI)
 5. How much urine do you lose each time? (ISI)*
- (* = included in the UCA)

Using IRT approaches this measure could be reduced further to three items. This shorter measure is referred to as the Urinary Continence Assessment (UCA) and may also be appropriate for prevalence studies.

Concluding message

This psychometric examination of the suitability of ISI and UDI-6 used in a community survey led to the development of two new short measures, combining the most useful items from both instruments. These new measures have good psychometric properties and could be considered by researchers and epidemiologists looking for short, reliable and valid scales of urinary incontinence (as defined by leakage). However, further research is needed to examine their broader applicability in clinical settings (where there would also be a greater number of people with moderate to severe incontinence symptoms).

References

1. Journal of Epidemiology and Community Health (1993) 47; 497-499.
2. Neurourology and Urodynamics (1995) 14; 131-139.
3. Health Measurement Scales: A practical guide to their development and use (3rd Ed.); Oxford, Oxford Medical Publications, 2003.

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HUMAN SUBJECTS: This study was approved by the Ethics approval was provided by the South Australian Health Omnibus Committee. Informed consent consistent with the Australian National Health and Medical Research Council Requirements was obtained. and followed the Declaration of Helsinki Informed consent was obtained from the patients.