Summary box:

What does this paper contribute to the wider global clinical community?

- To accurately identify the type of urinary incontinence is important in clinical practice as it influences the interventions required. The ICIQ-UI SF, which is recommended by the International Continence Society for assessing urinary incontinence symptoms, has an item to differentiate types of urinary incontinence.
- We found that the test-retest reliability of item 4 of the ICIQ-UI SF for assessing the type of urinary incontinence was not satisfactory, especially in male patients.
- Continence care nurses, nurse practitioners and other clinicians in primary care/ community settings should use the questionnaire with caution. The diagnosis of type of urinary incontinence should be further confirmed by other objective clinical tests.

The test-retest reliability of the Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) for assessing type of urinary incontinence in males and females

Keywords: nursing; lower urinary tract symptoms, urinary incontinence, psychometric, reliability, assessment, urology, questionnaires, patient-reported outcome

Aim:

The aim of the study was to evaluate the 2-week test-retest reliability of the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) for assessing type of urinary incontinence in males and females.

Background:

Urinary incontinence can be divided into different subtypes such as stress urinary incontinence (SUI), urge urinary incontinence (UUI) and mixed urinary incontinence. It is important to accurately identify the type of urinary incontinence as it influences the interventions required. For example, patients with SUI need pelvic floor muscle exercises while patients with UUI require bladder training. As resources and equipment are always limited in community and primary care settings, urodynamic testing and bladder stress tests are less commonly performed to differentiate the type of urinary incontinence. Instead, using screening questionnaire to identify the type of urinary incontinence is more practical and economical. The use of screening questionnaires is also commonly used to identify subject eligibility for urinary incontinence clinical trials and epidemiological studies estimating the prevalence of different types of urinary incontinence.

The International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) was recommended as a Grade A measure by the International Continence Society. The ICIQ-UI SF has four items assessing the frequency (Q1) and the amount of urinary incontinence (Q2), the impact of urinary incontinence on health-related quality of life (Q3) and the perceived cause of urinary incontinence (Q4) (Avery *et al.* 2004). Earlier studies suggest that Q4 can be used to differentiate type of urinary incontinence (Espuna-Pons *et al.* 2007). Many studies have confirmed the validity, reliability and responsiveness to change of the ICIQ-UI SF (Q1 to Q3), however, evidence on the psychometric properties of the Q4 of the ICIQ-UI SF remains very limited. Only one study has evaluated the test and retest reliability of this question in pregnant women in Taiwan (Chang *et al.* 2011), and found some items of this question were not reliable.

Design

The evaluation of the test-retest reliability of the ICIQ-UI SF was conducted as part of an observational study to evaluate the health status of Chinese primary care patients with lower urinary tract symptoms (LUTS).

Methods

Subjects and data collection

The details of the methodology have been reported elsewhere (Choi *et al.* 2014a). In brief, patients attending primary care clinics across Hong Kong were screened for LUTS using a modified ICIQ-UI SF. A cut-off score ≥ 3 was used for identification of subjects with LUTS and for inclusion in the study. Patients were excluded if they were aged <18 years; could not understand Cantonese; refused to participate; or were too ill to give consent. Subjects who consented were asked to provide their contact details and were subsequently contacted by interviewers to complete the instruments by telephone within 2-week (baseline) and at 2-week after baseline (test-retest interview)

Instruments

Since the main study targeted patients with different types of LUTS and not only patients with urinary incontinence, the ICIQ-UI SF was modified by replacing the wording "urinary leakage" with "urinary problems" in Q1 and Q3 in order to extend the applicability of the instrument to all patients with different types of LUTS. The Q1 to Q3 of the modified ICIQ-UI SF is available in the appendix of a published article (Choi *et al.* 2014b). The ICIQ-UI SF was administered at both baseline and 2-week interview.

Single item Global Rating of Change Scale (GRS) was added to the 2-week interview. The 5-point scale asked the subjects to rate the change in his/ her general health since the baseline telephone interview.

Data Analysis

Only subjects who had no change in their general health were included in the data analysis. The test-retest reliability was evaluated by Kappa statistics because it is an unscored question with eight items about the perceived cause of urinary leakage.

Ethics approval

The study protocol was approved by the Institutional Review Board of the University of Hong Kong/ Hospital Authority Hong Kong West Cluster, the Research Ethics Committee for Hong Kong Hospital Authority Kowloon East Cluster, Kowloon Central Cluster, Hong Kong East Cluster and Kowloon West Cluster.

Results

133 subjects were recruited at baseline. The mean age was 64.4 years. 41.4% of subjects were males. 100 subjects completed follow-up interview. 79 subjects had no change in their general health. The result of test-retest reliability is shown in table 1. Item 4.8 was excluded in the test-retest analysis because none of the subjects checked the item in both test and retest interviews. Overall, item 4.6 and item 4.7 had poor agreement (values <0.4). Subgroup analysis found that all items, except item 4.3 and 4.4, had poor agreement (values <0.4) in male subjects whilst only item 4.6 and 4.7 had poor agreement (values <0.4) in female subjects.

Conclusions

This was the first study to evaluate the 2-week test-retest reliability of item 4 of the ICIQ-UI SF in males and females with LUTS even though the instrument has been widely validated and used in different populations. The test-retest reliability of item four of the ICIQ-UI SF was not satisfactory, especially in males. Similar to the finding on pregnant women in Taiwan, we also found that item 4.6 had poor agreement. The change of responses to these items between test and retest could be due to poor reliability of the question or a change in symptoms. More research studies are needed to further investigate the criterion validation and reliability of the item.

Relevance to clinical practice

Clinicians should not solely rely on this item to differentiate the type of urinary incontinence in routine clinical practice and research study. Clinical test such as urodynamic test should be the "gold standard" to confirm the diagnosis. Misidentification of type of urinary incontinence might lead to wrong treatment regimes.

Funding

The present study was supported by the Small Project Funding, Committee on Research and Conference Grants of the University of Hong Kong (reference no: 201209176016) and the Health and Health Services Research Fund, Food and Health Bureau, HKSAR Commissioned Research on Enhancing Primary Care Study (reference no: EPC-HKU-2). There was no conflict of interest.

Contribution

Study design**:** EPHC, CLKL, WYC; data collection and analysis: EPHC; manuscript preparation: EPHC, CLKL, WYC.

Reference:

Avery K, Donovan J, Peters TJ, Shaw C, Gotoh M & Abrams P (2004) ICIQ: a brief and robust measure for evaluating the symptoms and impact of urinary incontinence. *Neurourology and Urodynamics* **23,** 322-30.

Chang SR, Chen KH, Chang TC & Lin HH (2011) A Taiwanese version of the International Consultation on Incontinence Questionnaire--Urinary Incontinence Short Form for pregnant women: instrument validation. *Journal of Clinical Nursing* **20,** 714-22.

Choi EP, Lam CL & Chin WY (2014a) The health-related quality of life of Chinese patients with lower urinary tract symptoms in primary care. *Quality of Life Research* **23,** 2723-33.

Choi EP, Lam CL & Chin WY (2014b) The Incontinence Impact Questionnaire-7 (IIQ-7) Can Be Applicable to Chinese Males and Females with Lower Urinary Tract Symptoms. *The Patient* **7,** 403-11.

Espuna-Pons M, Dilla T, Castro D, Carbonell C, Casariego J & Puig-Clota M (2007) Analysis of the value of the ICIQ-UI SF questionnaire and stress test in the differential diagnosis of the type of urinary incontinence. *Neurourology and Urodynamics* **26,** 836-41.

Table 1: Results

Socio-demographics of study subjects (n=133)		
Mean age (SD)	64.4	(11.2)
Gender (%)		
Male	41.4	
Female	58.6	

Kappa statistics # (n=79^)					
		Females n=41	**Males n=38**	**Overall n=79**	**Study in Taiwan n=55 (Chang *et al.* 2011)**
ICIQ-UI SF					
Q4. When does urine leak? (please tick all that apply to you)					
4.1	Never- urine does not leak	0.69	0.37	0.5	0.82
4.2	Leaks before you can get to the toilet	0.69	0.37	0.53	N/A
4.3	Leaks when you cough or sneeze	0.46	0.45	0.66	0.78
4.4	Leaks when you are asleep	0.47	0.47	0.47	N/A
4.5	Leaks when you are physically active/exercising	0.76	-0.27	0.67	0.65
4.6	Leaks when you have finished urinating and are dressed	0.13	0.17	0.23	-0.02
4.7	Leaks for no obvious reason	-0.62	-0.44	-0.65	0.66
4.8	Leaks all the time*	N/A	N/A	N/A	N/A

#Kappa coefficient ranges from -1 (perfect disagreement) to 1 (perfect agreement). It usually falls between 0 and 1. A Kappa coefficient > 0.75 indicated strong agreement, 0.40-0.75 moderate agreement and <0.40 poor agreement. A negative kappa coefficient indicates that the agreement is worse than that expected by chance

^Only subjects who had no change in their general health were included in the data analysis

* None of the subjects checked the item in test and retest interviews. Kappa statistics is not available.