

Pain and Urinary Symptoms Should Not be Combined into a Single Score: Psychometric Findings from the MAPP Research Network

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Purpose: The purpose of this study was to create symptom indexes, that is scores derived from questionnaires to accurately and efficiently measure symptoms of interstitial cystitis/bladder pain syndrome and chronic prostatitis/chronic pelvic pain syndrome, collectively referred to as urological chronic pelvic pain syndromes. We created these indexes empirically by investigating the structure of symptoms using exploratory factor analysis.

Materials and Methods: As part of the MAPP (Multi-Disciplinary Approach to the Study of Chronic Pelvic Pain) Research Network 424 participants completed questionnaires, including GUPI (Genitourinary Pain Index), ICSI (Interstitial Cystitis Symptom Index) and ICPI (Interstitial Cystitis Problem Index). Individual items from questionnaires about bladder and pain symptoms were evaluated by principal component and exploratory factor analyses to identify indexes with fewer questions to comprehensively quantify symptom severity. Additional analyses included correlating symptom indexes with symptoms of depression, which is a known comorbidity of patients with pelvic pain.

Results and Conclusions: Exploratory factor analyses suggested that the 2 factors pain severity and urinary severity provided the best psychometric description of items in GUPI, ICSI and ICPI. These factors were used to create 2 symptom indexes for pain and urinary symptoms. Pain, but not urinary symptoms, was associated with symptoms of depression on multiple regression

Abbreviations and Acronyms

CP/CPPS = chronic prostatitis/chronic pelvic pain syndrome
EFA = exploratory factor analysis
HADS = Hospital Anxiety and Depression Scale
IC/BPS = Interstitial cystitis/bladder pain syndrome
QOL = quality of life
SYMQ = Symptom and Health Care Utilization Questionnaire
UCPPS = urological chronic pelvic pain syndromes

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analysis, suggesting that these symptoms may impact patients with urological chronic pelvic pain syndromes differently ($B \pm SE$ for pain severity = 0.24 ± 0.04 , 95% CI 0.16–0.32, $\beta = 0.32$, $p < 0.001$). Our results suggest that pain and urinary symptoms should be assessed separately rather than combined into 1 total score. Total scores that combine the separate factors of pain and urinary symptoms into 1 score may be limited for clinical and research purposes.

Key Words: urinary bladder; prostatitis; cystitis, interstitial; chronic pain; factor analysis, statistical

INTERSTITIAL cystitis/bladder pain syndrome and CP/CPSP are collectively referred to as UCPPS.¹ Despite past efforts UCPPS have an unknown etiology, is difficult to effectively treat and negatively affects QOL, work productivity and health care use.^{2–7} In response NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases) established the MAPP Research Network, which uses a highly collaborative approach to better understand these syndromes, including studying natural history, underlying pathophysiology, biomarkers, possible infectious etiology and patient subgroups that are potentially relevant to treatment.^{8,9} Because characterization and subtyping rely on precise symptom measurement, the purpose of this study was to identify the most effective symptom indexes to characterize UCPPS.

A number of symptom questionnaires have been developed to assess UCPPS.^{10–12} Of them GUPI¹⁰ and ICSI/ICPI¹¹ are used most frequently to assess the impact of UCPPS as well as the outcomes of clinical trials. These questionnaires differ in their assumptions about how symptoms cluster together so it is necessary to look across symptom indexes in a comprehensive empirical way to identify key factors to characterize UCPPS. For example GUPI yields 4 scores, including pain, urinary symptoms, QOL impact and a total score.¹⁰ In contrast ICSI and ICPI are organized into 2 subscales for symptom frequency vs bother and problems.¹¹ In total GUPI and ICSI/ICPI yield 6 possible scores, including total symptoms, pain, urinary symptoms, QOL impact, IC/BPS symptom score and IC/BPS problem score.

The goal of this study was to simplify this list to a smaller number of indexes and decrease the number of questions needed to assess UCPPS. In doing so we sought to identify indexes that could be efficiently and effectively used in clinical and research settings.

Pursuant to our goal we performed EFA to examine questionnaire items that had been administered to participants with UCPPS as part of an observational study.^{8,9} EFA can empirically resolve differences among questionnaire structures and help identify factors that can be used to create symptom indexes. We also examined relationships with symptoms of depression, a known comorbidity

of UCPPS.^{13–17} We had 2 hypotheses, including 1) symptoms of UCPPS could be reduced to a small number of indexes and 2) these indexes would show differential relationships with symptoms of depression.

MATERIALS AND METHODS

A total of 424 participants with UCPPS (55% female and 45% male) were recruited at 7 sites, including Washington University at St. Louis (75, 18%), University of Washington (71, 17%), University of Michigan (70, 17%), University of California-Los Angeles (66, 16%), University of Iowa (61, 14%), Northwestern University (58, 14%) and Stanford University (23, 5%). Study inclusion criteria included 1) a diagnosis of IC/BPS or CP/CPSP with symptoms present during any 3 of the last 6 months (CP/CPSP) or the most recent 3 months (IC/BPS), 2) age at least 18 years and 3) a nonzero score for bladder/prostate and/or pelvic region pain, pressure or discomfort during the last 2 weeks. Exclusion criteria included urethral stricture; neurological conditions affecting the bladder or bowel; autoimmune or infectious disorders; history of cystitis caused by tuberculosis, radiation or chemotherapy; history of non-dermatological cancer; major psychiatric disorders; or severe cardiac, pulmonary, renal or hepatic disease.⁸

GUPI, ICPI/ICSI and other questionnaires^{18,19} were completed at the baseline assessment of the Trans-MAPP Epidemiology/Phenotyping Study.⁸ Other urological questionnaires, for example AUA SI (American Urological Association Symptom Index),¹⁸ were administered in this study but not analyzed because they were considered redundant with GUPI and ICSI/ICPI.

Measures

GUPI. GUPI includes questions about urinary symptoms, QOL, and pain location and intensity. Total scores range from 0 to 45 and individual scores on the domains of pain, urinary symptoms and QOL impact can also be derived.¹⁰ Certain items have subquestions that can be analyzed individually. Item 1 asks men and women where they feel pain (eg testicles or entrance to the vagina). This was analyzed as a 0 to 4 indicator of the number of areas that were checked. Item 2 has 4 subquestions about the presence of symptoms (eg pain or burning during urination). Items 3 to 9 are single questions that quantify the frequency and intensity of symptoms and QOL issues. All items of the GUPI were included in our analyses using 12 indicators (items 1, 2a to 2d and 3 to 9).

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