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The prevalence of urinary incontinence in men and women aged 40 years or over in China, Taiwan and South Korea: A cross-sectional, prevalence-based study

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Abstract

Objectives: To assess prevalence of urinary incontinence (UI), including urgency UI (UUI), stress UI (SUI) and mixed UI (MUI) in individuals aged ≥ 40 years in China, Taiwan and South Korea.

Method: This was a post hoc analysis of a cross-sectional, questionnaire-based internet survey. Participants were asked questions relating to urinary symptoms, health-related quality of life (HRQoL) and mental health (using the HRQoL 12-item short form health survey mental health and physical domains, and the Hospital Anxiety and Depression Scale), visits to healthcare professionals (HCPs) for any reason or for urinary symptoms, treatments for urinary symptoms and treatment satisfaction.

Results: Of 8284 survey participants, 1818 (22%) reported any UI (men 17.3%, women 26.4%). MUI was the most prevalent (overall 9.7%, men 6.8%, women 12.6%) followed by SUI (overall 7.9%, men 5.1%, women 10.7%) and UUI (overall 4.3%, men 5.5%, women 3.2%). HRQoL, anxiety and depression scores were poor in all participants with UI; MUI was associated with the worst scores. Of the participants with UI, 46.9% visited HCPs for urinary symptoms (highest proportion [62.7%] among participants with MUI). Approximately 80% of participants with UI followed treatment, with prescribed medicine being the most common form (38.1%). Over half of participants (59.6%) were somewhat, very, or extremely satisfied with their treatment. MUI was associated with least satisfaction.

Conclusion: UI was associated with substantial problems, including an adverse impact on HRQoL. Medication failed to satisfy many individuals with UI. Efforts to educate the public and physicians about the impact of UI could improve diagnosis and treatment rates.

KEYWORDS

China, prevalence, South Korea, Taiwan, urinary incontinence (UI)

1 | INTRODUCTION

Urinary incontinence (UI), defined as the involuntary loss of urine, may be divided into three key subtypes: urgency UI (UUI), which is

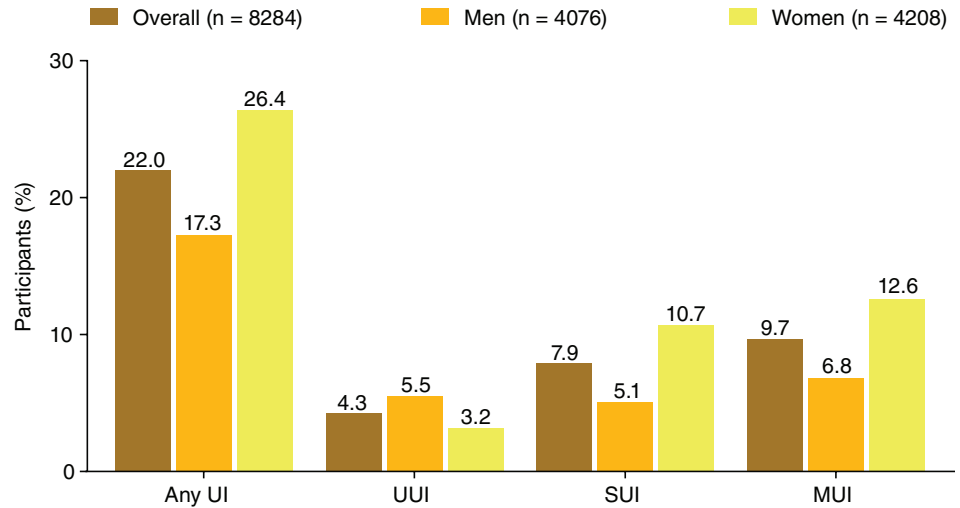
the involuntary leakage of urine preceded by urgency (a sudden compelling desire to pass urine that is difficult to defer); stress UI (SUI), which is synchronous with exertion/effort, sneezing or coughing; and mixed UI (MUI), where UUI and SUI coexist.^{1,2} Estimates of UI

TABLE 1 Demographics and baseline characteristics of individuals with UI

Variable	Any UI			UUI			SUI			MUI		
	Overall n = 1818	Men n = 707	Women n = 1112	Overall n = 355	Men n = 222	Women n = 133	Overall n = 656	Men n = 206	Women n = 450	Overall n = 807	Men n = 278	Women n = 528
Age, y, mean (SD)	57.8 (20.4)	56.4 (20.1)	58.8 (20.7)	57.2 (22.6)	56.2 (23.5)	59.1 (21.1)	58.0 (21.2)	56.9 (18.5)	58.5 (22.4)	58.0 (18.7)	56.2 (18.2)	59.0 (18.9)
Marital status, n (%)												
Married/living with partner	1613 (88.7)	646 (91.4)	966 (86.9)	293 (82.5)	194 (87.1)	99 (74.9)	579 (88.2)	189 (91.7)	390 (86.7)	740 (91.7)	264 (94.7)	477 (90.2)
Single	73 (4.0)	29 (4.1)	43 (3.9)	24 (6.8)	16 (7.1)	9 (6.4)	31 (4.7)	5 (2.3)	26 (5.7)	18 (2.2)	9 (3.2)	9 (1.7)
Widow/widower	87 (4.8)	20 (2.8)	67 (6.0)	27 (7.5)	8 (3.5)	19 (14.1)	29 (4.5)	9 (4.3)	21 (4.6)	31 (3.8)	3 (1.0)	28 (5.3)
Divorced	42 (2.3)	11 (1.5)	31 (2.8)	10 (2.9)	5 (2.3)	5 (3.8)	14 (2.1)	3 (1.3)	11 (2.4)	18 (2.3)	3 (1.1)	15 (2.9)
Prefer not to answer	5 (0.2)	1 (0.1)	4 (0.3)	1 (0.3)	0	1 (0.8)	3 (0.5)	1 (0.4)	3 (0.6)	0	0	0
Education, n (%)												
High school or lower	539 (29.6)	173 (24.5)	366 (32.9)	90 (25.3)	48 (21.6)	42 (31.5)	234 (35.6)	63 (30.6)	171 (37.9)	215 (26.7)	62 (22.2)	153 (29.0)
Some college	413 (22.7)	164 (23.3)	249 (22.4)	67 (18.8)	40 (18.0)	27 (20.2)	136 (20.8)	53 (25.9)	83 (18.4)	210 (26.0)	71 (25.5)	139 (26.3)
College degree/college graduate	770 (42.4)	331 (46.8)	440 (39.5)	180 (50.6)	116 (52.3)	64 (47.8)	255 (38.8)	84 (40.8)	171 (38.0)	336 (41.6)	130 (46.8)	205 (38.8)
Postgraduate	96 (5.3)	39 (5.5)	57 (5.1)	19 (5.2)	18 (8.0)	1 (0.5)	31 (4.8)	6 (2.8)	26 (5.7)	46 (5.7)	15 (5.4)	31 (5.9)
Work status, n (%)												
Working, full-time	937 (51.5)	403 (57.0)	534 (48.1)	196 (55.2)	134 (60.4)	62 (46.6)	313 (47.6)	116 (56.3)	197 (43.7)	429 (53.1)	153 (54.9)	276 (52.5)
Working, part-time	109 (6.0)	46 (6.5)	63 (5.7)	26 (7.3)	20 (8.8)	6 (4.8)	36 (5.4)	8 (4.0)	28 (6.1)	48 (5.9)	18 (6.6)	29 (5.5)
Unemployed	18 (1.0)	4 (0.6)	14 (1.3)	9 (2.4)	3 (1.5)	5 (3.9)	4 (0.7)	0	4 (1.0)	5 (0.7)	1 (0.4)	4 (0.8)
Retired	507 (27.9)	221 (31.3)	285 (25.7)	82 (23.0)	50 (22.5)	32 (23.9)	182 (27.7)	69 (33.7)	113 (25.0)	243 (30.1)	102 (36.6)	141 (26.7)
Homemaker	186 (10.2)	3 (0.4)	184 (16.5)	20 (5.6)	0	20 (14.9)	100 (15.3)	3 (1.2)	98 (21.7)	66 (8.2)	0	66 (12.6)
Other work for pay	13 (0.7)	7 (1.0)	6 (0.5)	6 (1.7)	5 (2.3)	1 (0.7)	5 (0.8)	1 (0.5)	4 (0.9)	2 (0.2)	1 (0.3)	1 (0.1)
Permanently disabled/ cannot work due to ill health	17 (0.9)	7 (1.0)	9 (0.8)	5 (1.5)	3 (1.1)	3 (2.1)	5 (0.8)	4 (1.9)	1 (0.2)	6 (0.8)	1 (0.4)	5 (1.0)
Student	3 (0.1)	2 (0.2)	1 (0.1)	1 (0.2)	1 (0.4)	0	1 (0.1)	1 (0.4)	0	1 (0.1)	0	1 (0.2)
Other	28 (1.6)	13 (1.9)	15 (1.3)	11 (3.1)	7 (3.0)	4 (3.2)	10 (1.6)	4 (2.0)	6 (1.4)	7 (0.8)	2 (0.8)	4 (0.8)

Note: Numbers of individuals are weighted and rounded, and hence may not add up; percentages are based on the weighted "n" values. Abbreviations: MUI, mixed UI; SD, standard deviation; SUI, stress UI; UI, urinary incontinence; UUI, urgency UI.

FIGURE 1 Prevalence of UUI, SUI and MUI. Numbers of individuals are weighted and rounded; percentages are based on the weighted “n” values. Abbreviations: MUI, mixed UI; SUI, stress UI; UI, urinary incontinence; UUI, urgency UI



prevalence vary widely due to differences in methodology between studies, definition of UI and cultural differences in the perception of the condition and willingness to report it.^{3,4} In men, prevalence ranges from 1% to 39%, increasing with older age and number of comorbidities, with UUI being the most common form⁴ while in women, estimates range from 5% to 72%, with SUI being most prevalent.³ In the Epidemiology of Lower Urinary Tract Symptoms (EpiLUTS) internet survey of individuals aged ≥ 40 years, UI prevalence was 46% in men and 68% in women.⁵ The study broadened the definition of UI to include “other incontinence,” which included post-micturition incontinence, nocturnal enuresis, leaking during sex, leaking for other reasons, and leaking for no reason. A study of the worldwide prevalence of UI estimated the regional burden to be greatest in Asia, with numbers of affected individuals expected to increase by 24% from 2008 to >250 million in 2018, primarily due to population growth and overall aging.⁶

UI has a detrimental effect on an individual’s well-being.⁷ In the EpiLUTS study, UI was associated with a significant impact on mental and physical health, particularly in those with more than one type of UI.⁵ In an analysis of the National Social Life, Health and Aging Project undertaken in US adults from 2010 to 2011, UI was one of the most significant contributors to poor mental health for women.⁸ A number of studies undertaken in Asia have also demonstrated the negative association of UI with health-related quality of life (HRQoL)/mental health,⁹⁻¹⁸ reporting a substantial impact that can be similar to or greater than that caused by other chronic medical diseases, such as diabetes, hyperlipidemia, and chronic kidney disease.^{13,19} Despite this, a large proportion of individuals with UI do not seek treatment for their symptoms^{20,21} and of those who receive pharmacotherapy, many are dissatisfied and discontinue medication.²²

In 2015, an internet-based survey was undertaken in individuals aged ≥ 40 years in China, Taiwan and South Korea relating to lower urinary tract symptoms (LUTS; ClinicalTrials.gov identifier: NCT02618421). The primary objective of the survey was to determine the prevalence of LUTS (based on International Continence Society [ICS] 2002 definitions), and has been previously reported.²³ The

objective of this post hoc analysis is to describe the prevalence of UI (UUI, SUI and MUI) in the same population.

2 | METHODS

This cross-sectional, internet-based questionnaire study was representative of the general population in China, Taiwan and South Korea, and was conducted between 2 June and 20 July 2015. The methodology has been previously published²³ and is described here in brief. Participants were ≥ 40 years of age with internet access and the ability to read the local language. Those who were pregnant or who had a urinary tract infection diagnosed by a physician within the previous month were excluded from the analyses. Informed consent was obtained from all participants and the study was performed in compliance with Declaration of Helsinki, Good Clinical Practice, and the European Society for Opinion and Marketing Research (ESOMAR)²⁴ guidelines.

Assessment of any UI (UUI, SUI or MUI) over the past month was based on the ICS definition of symptoms.¹ Respondents were asked if they had experienced incontinence. Those who responded “yes” were asked whether they leaked urine in connection with either a sudden need to rush to urinate (defined as UUI) or with laughing, sneezing, coughing, exercising, lifting heavy objects or during sexual activity (defined as SUI). Respondents who reported both UUI and SUI were considered to have MUI. Individuals were asked to grade their incontinence on a 5-point Likert scale from <1/month to many times a day, according to subtype.

Quality of life was assessed using the HRQoL 12-item short form health survey (HRQoL-SF12v2) mental health and physical domains in all participants, regardless of their experience of incontinence.²⁵ Scores on this scale can range from 0 to 100, with a lower score indicating a worse HRQoL. Mental health was also assessed using the Hospital Anxiety and Depression Scale (HADS) in which scores for each domain are grouped into three classifications: 0 to 7 (normal), 8 to 10 (borderline abnormal), 11 to 21 (abnormal).²⁶ All instruments in the study were validated in the local language.

TABLE 2 Prevalence of UI by age

Age, y	Prevalence, n (% within age group)								
	Any UI ^a		UII ^a		SUI ^a		MUJ ^a		
	Overall	Men	Women	Overall	Men	Women	Overall	Men	Women
Overall	1818 (22.0)	707 (17.3)	1112 (26.4)	355 (4.3)	222 (5.5)	133 (3.2)	807 (9.7)	278 (6.8)	528 (12.6)
40–44	206 (13.8)	92 (12.2)	114 (15.4)	44 (2.9)	32 (4.3)	12 (1.6)	79 (5.2)	31 (4.1)	48 (6.4)
45–49	251 (16.8)	95 (12.6)	157 (21.2)	49 (3.3)	35 (4.6)	14 (1.9)	103 (6.9)	39 (5.2)	64 (8.6)
50–54	259 (19.8)	89 (13.5)	170 (26.2)	54 (4.1)	33 (5.0)	20 (3.1)	112 (8.6)	26 (4.0)	86 (13.2)
55–59	294 (25.9)	98 (17.3)	196 (34.6)	56 (5.0)	30 (5.3)	26 (4.6)	148 (13.1)	44 (7.7)	104 (18.4)
≥60	808 (28.3)	334 (24.8)	475 (31.4)	152 (5.3)	92 (6.9)	60 (4.0)	365 (12.8)	139 (10.3)	226 (15.0)

Note: Numbers of individuals are weighted and rounded, and hence may not add up; percentages are based on the weighted "n" values.

Abbreviations: MUJ, mixed UI; SUI, stress UI; UI, urinary incontinence; UII, urgency UI.

^aP values were less than .05 within men, women and the overall group, indicating that increasing age was a significant factor influencing prevalence in all symptom groups.

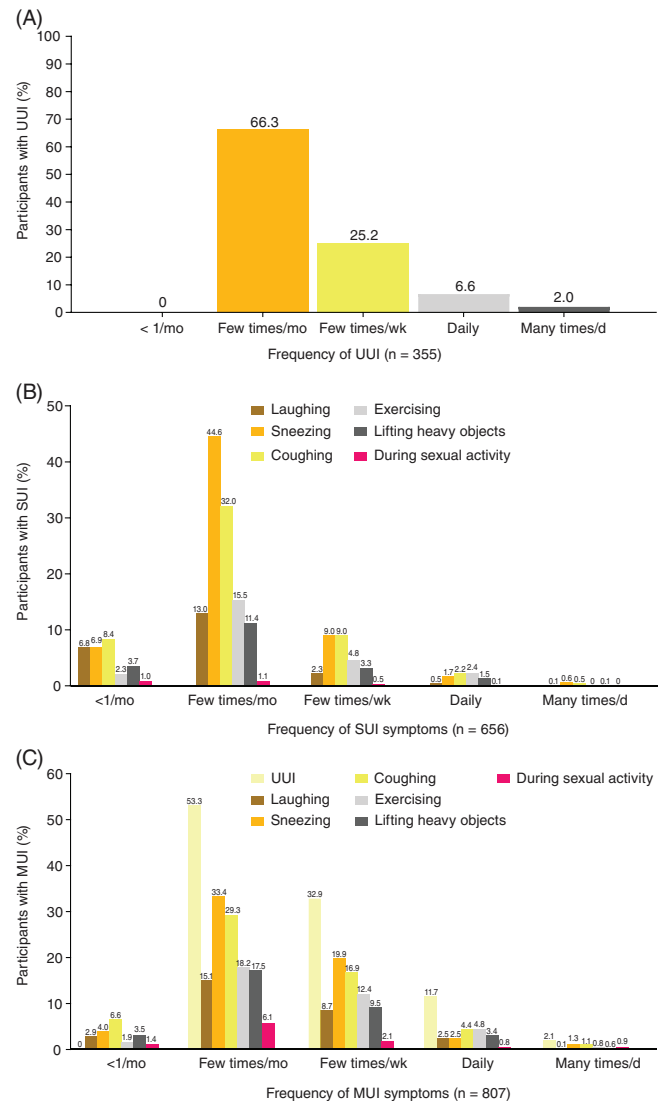
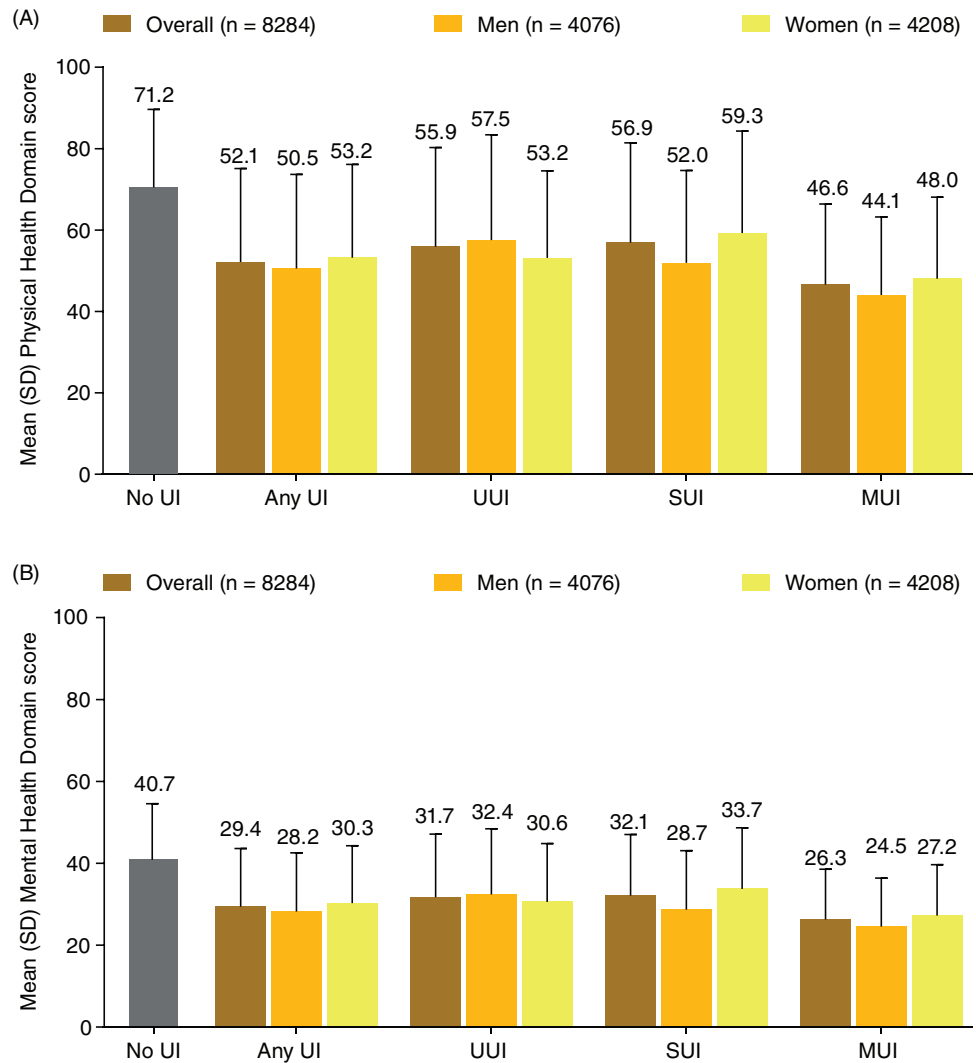


FIGURE 2 Frequency of UII (A), and of symptoms of SUI (B), and MUI (C), in the overall population. *P values were less than .05 between the SUI symptom groups, indicating that the treatment patterns were significantly different. Numbers of individuals are weighted and rounded; percentages are based on the weighted "n" values. Abbreviations: MUI, mixed UI; SUI, stress UI; UI, urinary incontinence; UII, urgency UI

Visits to healthcare professionals (HCPs) for any reason and for ICS-defined urinary symptoms were recorded. Participants were also asked about treatments for their urinary symptoms, including prescription medications, surgery, physical therapy (exercise or training recommended by a HCP), self-treatment (herbal remedies or over-the-counter medicines, or exercise recommended by friends or family), limiting intake of fluids/caffeine/alcohol, not drinking after a certain time at night, and wearing pads. Patient satisfaction with these treatments was evaluated.

All statistical analyses were post hoc and data for participants in the three countries were combined. Post-stratification weighting matched the population distribution (age and gender) per country. For the purpose of the analysis, all UI subtypes were considered as mutually

FIGURE 3 Health-related quality of life physical health domain (A), and mental health domain B, scores (assessed using the 12-item short-form health survey) according to type of incontinence (International Continence Society criteria). Range of scores: 0-100; (A) lower score indicates a worse quality of life. Abbreviations: MUI, mixed UI; SD, standard deviation; SUI, stress UI; UI, urinary incontinence; UUI, urgency UI



exclusive. For treatment interventions and satisfaction, *P* values were based on the Chi-square test.

3 | RESULTS

As previously reported, 8284 participants completed the survey, with a mean age of 54.2 years (52.3 years for men [$n = 4076$]; 56.2 years for women [$n = 4208$]).^{23,27} In those with UI, mean (standard deviation [SD]) age was slightly higher than in the full study population (overall population with UI 57.8 [20.4] years, men 56.4 [20.1] years, women 58.8 [20.7] years). Demographic characteristics were broadly similar between UI subtypes, although mean age was slightly higher among women than men across all UI subtypes (Table 1).

Of the total number of survey participants, 1818 (22.0%) reported any UI, with more women (26.4%) than men (17.3%) affected (Figure 1). MUI was the most common subtype both in the total population (9.7%) and in both genders separately (men 6.8%, women, 12.6%). SUI was the second most common subtype in the total population (7.9%), although this was reported by twice as many women

(10.7%) than men (5.1%). Overall, 4.3% reported UUI, which was more common in men (5.5%) than in women (3.2%).

Increasing age was a significant factor influencing increased prevalence across UI subtypes (Table 2). In the youngest age group (40-44 years), SUI and MUI were more prevalent than UUI (5.6% and 5.2%, respectively vs 2.9%), and more prevalent in women than in men. Among women, the prevalence of any UI was more than twice as high in the 55-59 years age group than in the 40-44 years age group (34.6 vs 15.4%), and the prevalence of MUI was almost three-fold higher (18.4% vs 6.4%). The prevalence of MUI and UUI tailed off slightly in the oldest age group (≥ 60 years).

The majority of participants with UUI experienced symptoms at least a few times a month (66.3%), with a third experiencing them a few times a week or more (Figure 2A). In those with SUI, sneezing and coughing were the most prevalent causes of UI, with 44.6% and 32.0% of participants reporting that they experienced symptoms a few times a month (Figure 2B). In those with MUI, UUI was most prevalent, and was reported at least a few times a month in 53.3% of participants (Figure 2C). A greater proportion of participants with MUI reported UI caused by sneezing and coughing a few times a week

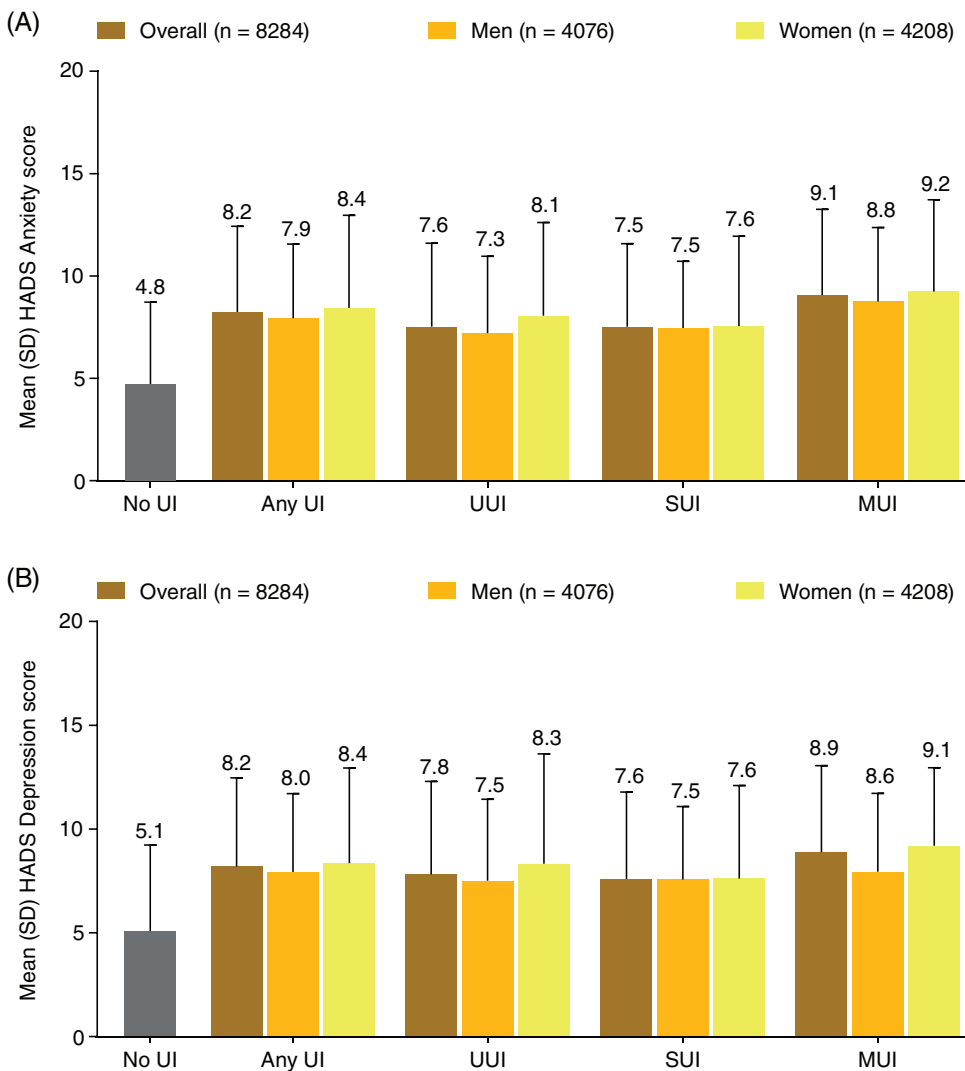


FIGURE 4 Hospital Anxiety (A), and Depression (B) Scale scores according to type of incontinence (International Continence Society criteria). Classification of total score for both anxiety and depression: 0–7 (normal), 8–10 (borderline abnormal), 11–21 (abnormal). Abbreviations: HADS, Hospital Anxiety and Depression Scale; MUI, mixed UI; SD, standard deviation; SUI, stress UI; UI, urinary incontinence; UUI, urgency UI

(19.9% and 16.9%, respectively; Figure 2C) than for those with SUI alone (9.0% for each symptom; Figure 2B). Differences between men and women for UUI were not significant but differences across SUI symptoms in those with SUI or MUI were significant ($P < .05$).

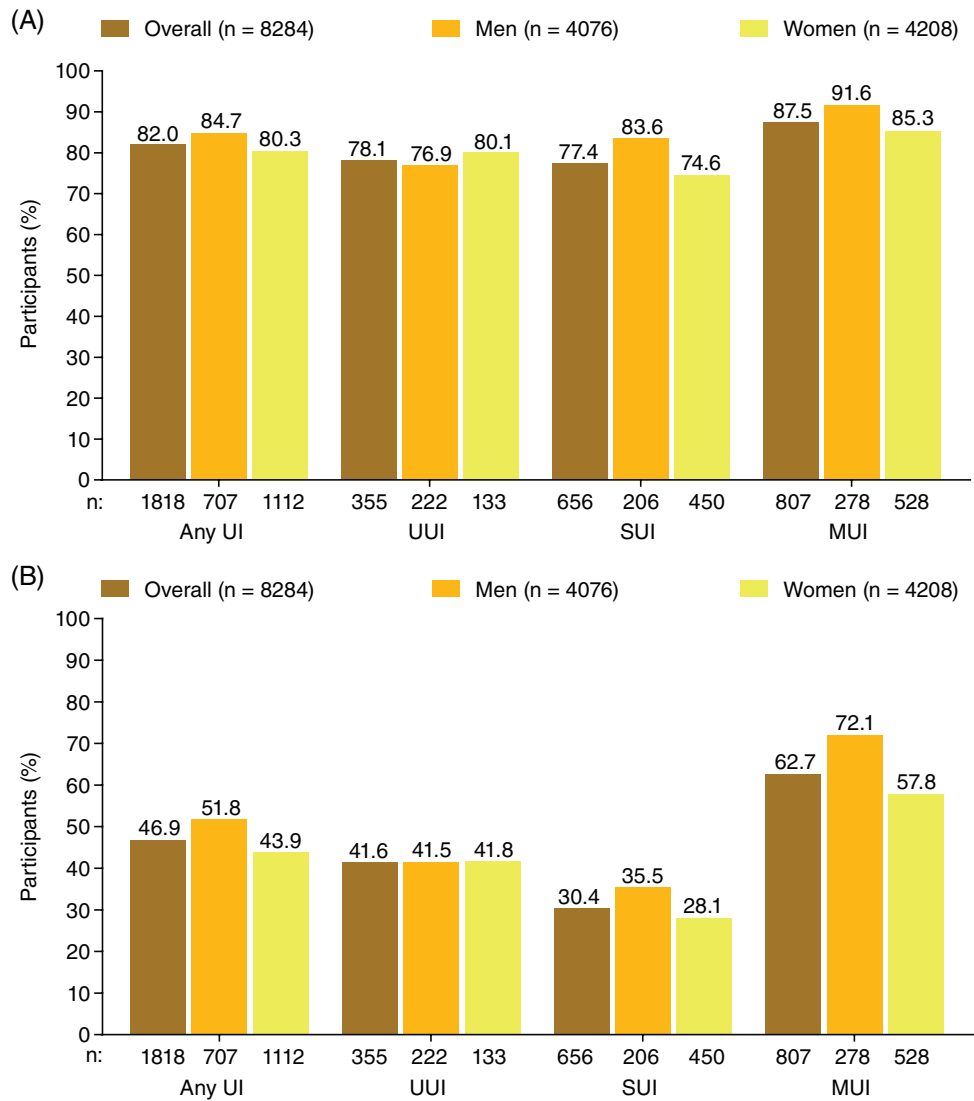
For both mental health and physical domains, HRQoL scores were worse (lower) in all participants with UI versus those without UI (Figure 3). In particular, MUI was associated with worse HRQoL scores than SUI or UUI on both domains. Men with MUI or SUI reported worse scores than women on both the physical and mental HRQoL domains, while women with UUI reported worse scores than men on both domains. UI was also associated with worse (higher) anxiety and depression scores than scores for participants without UI (Figure 4), with the worst scores reported in those with MUI, versus those with SUI or UUI. For those reporting SUI, anxiety and depression scores were similar between the sexes, while scores for women with UUI or MUI tended to be slightly worse than those for men.

Fewer than half the participants with any UI (46.9%) visited HCPs for urinary symptoms, despite 82.0% of participants with UI visiting HCPs for any reason (Figure 5). The highest percentage of

visits was observed among individuals with MUI (87.5% visiting an HCP for any reason [Figure 5A] and 62.7% about their urinary symptoms [Figure 5B]). More men (91.6%) than women (85.3%) with MUI visited HCPs for any reason; this difference was more marked for those with MUI who visited for urinary symptoms (72.1% vs 57.8%, respectively). Although a similar proportion of those with UUI (78.1%) or SUI (77.4%) visited HCPs for any reason, more individuals with UUI (41.6%) than those with SUI (30.4%) visited HCPs for urinary symptoms. However, more women than men with UUI visited HCPs for any reason (80.1% vs 76.9%, respectively), although similar proportions visited HCPs for urinary symptoms (41.8% vs 41.5%, respectively). Conversely, more men than women with SUI visited HCPs for any reason (83.6% vs 74.6%, respectively) or for their urinary symptoms (35.5% vs 28.1%, respectively).

Treatment for urinary symptoms was followed by approximately 80% of participants with any UI (Table 3). The most common forms of treatment were prescribed medicine (38.1%), limiting fluid intake (34.1%), self-treatment (27.9%) and physical therapy (27.2%). Generally, more men than women followed treatment, particularly prescribed

FIGURE 5 Healthcare-seeking for any reason (A), or for urinary symptoms (B), according to International Continence Society symptoms. Figure only shows data from respondents with UI who answered the question related to healthcare-seeking. Abbreviations: HCP, healthcare professional; MUI, mixed UI; SUI, stress UI; UI, urinary incontinence; UUI, urgency UI



medicine, self-treatment (except UUI), limiting alcohol intake or not drinking after a certain time at night (except UUI), although more women than men used pads, especially those with UUI. A greater proportion of participants with MUI than those with SUI or UUI reported following some form of treatment for their urinary symptoms, independent of the type of treatment. Over half of all participants (59.6%) were somewhat, very, or extremely satisfied with their treatment (Table 4). Of the participants who were dissatisfied, the majority were somewhat dissatisfied (31.9%) with their treatment rather than very dissatisfied (7.2%) or extremely dissatisfied (1.3%). Of participants prescribed medication, a majority were somewhat (55.1%) or very (6.7%) satisfied with treatment, with similar proportions generally noted between men and women (Table 5). Few participants were extremely satisfied with treatment (0.4%). Participants most satisfied with medication treatment were those with SUI (76.0%) and women with UUI (70.2%), while only just over half (53.8%) of those with MUI were satisfied with medication treatment. Of the participants who were dissatisfied with medication treatment, the majority were somewhat dissatisfied (31.5%) rather than very dissatisfied (5.4%); low numbers (1.0%) were extremely dissatisfied.

4 | DISCUSSION

This analysis of a large internet-based study of more than 8200 participants aged ≥ 40 years confirms that UI is common in adults in China, Taiwan and South Korea, with more than one in five individuals and more women (26.4%) than men (17.3%) reporting UI. The most prevalent subtype was MUI followed by SUI and UUI. Most participants reported symptoms at least several times a month, including many who reported problems several times a week and some who reported UI on a daily basis.

Published UI prevalence estimates vary widely, due at least in part to differences in UI definition and sampling strategies (for example face-to-face, phone or internet surveys).²⁸ In Asia (China, Taiwan and Korea), UI prevalence has been studied predominantly in populations that include young adults at a lower risk of UI than older individuals^{9-11,29-32} and in women,^{9,10,12,13,29,30} with few data available for men alone^{11,33} or for both genders.^{31,32} Not all studies report prevalence of UI subtypes,^{9,13} while others have included additional UI subtypes (involuntary leakage but not UUI or SUI).³² Despite these

TABLE 3 Participants currently following treatment for urinary symptoms

Treatment	Any UI, n (%) ^a		UUI, n (%) ^a		SUI, n (%) ^a		MUI, n (%) ^a					
	Overall n = 1818	Men n = 707	Women n = 1112	Overall n = 355	Men n = 222	Women n = 133	Overall n = 656	Men n = 206	Women n = 450	Overall n = 807	Men n = 278	Women n = 528
Prescribed medicine	693 (38.1)	304 (43.1)	389 (35.0)	140 (39.3)	93 (42.0)	46 (34.8)	200 (30.5)	78 (37.9)	122 (27.1)	353 (43.7)	133 (47.7)	220 (41.7)
Surgery	52 (2.9)	14 (2.0)	38 (3.4)	8 (2.2)	4 (2.0)	4 (2.6)	15 (2.4)	2 (0.9)	14 (3.0)	29 (3.6)	8 (2.9)	21 (3.9)
Physical therapy	495 (27.2)	201 (28.5)	294 (26.4)	64 (17.9)	38 (17.0)	26 (19.4)	137 (20.9)	46 (22.5)	91 (20.2)	294 (36.5)	117 (42.1)	177 (33.5)
Self-treatment	508 (27.9)	226 (31.9)	283 (25.4)	65 (18.4)	33 (14.9)	32 (24.2)	173 (26.4)	75 (36.4)	98 (21.8)	270 (33.4)	117 (42.2)	152 (28.8)
Limit fluid	620 (34.1)	249 (35.2)	371 (33.4)	87 (24.6)	49 (22.1)	38 (28.9)	170 (25.9)	59 (28.7)	111 (24.6)	363 (45.0)	141 (50.6)	222 (42.0)
Limit caffeine	290 (15.9)	119 (16.8)	171 (15.4)	37 (10.4)	23 (10.4)	14 (10.5)	65 (9.9)	23 (11.0)	42 (9.4)	188 (23.3)	73 (26.2)	115 (21.8)
Limit alcohol	272 (15.0)	157 (22.2)	116 (10.4)	44 (12.3)	37 (16.6)	7 (5.1)	60 (9.1)	30 (14.7)	30 (6.6)	169 (20.9)	89 (32.1)	79 (15.0)
No drinking after certain time at night	292 (16.1)	144 (20.3)	148 (13.3)	46 (12.9)	27 (12.3)	18 (13.8)	64 (9.8)	24 (11.8)	40 (8.9)	182 (22.5)	92 (33.0)	90 (17.0)
Wearing pads	172 (9.5)	49 (6.9)	124 (11.1)	18 (5.1)	6 (2.9)	12 (8.7)	30 (4.5)	7 (3.5)	22 (5.0)	125 (15.5)	35 (12.6)	90 (17.0)
Any treatment	1444 (79.4)	585 (82.8)	859 (77.3)	259 (72.9)	160 (72.1)	99 (74.2)	460 (70.1)	166 (80.5)	294 (65.3)	725 (89.9)	258 (93.0)	466 (88.2)

Note: Numbers of individuals are weighted and rounded, and hence may not add up; percentages are based on the weighted "n" values.

Abbreviations: MUI, mixed UI; SD, standard deviation; SUI, stress UI; UUI, urgency UI.

^aP values were less than .05 within men, women and the overall group, indicating that the treatment patterns were significantly different between the symptom groups.

TABLE 4 Participant satisfaction with any treatment

Treatment satisfaction	Any UI, n (%) ^a		UUI, n (%) ^a		SUI, n (%) ^a		MUI, n (%) ^a					
	Overall n = 1444	Men n = 585	Women n = 859	Overall n = 259	Men n = 160	Women n = 99	Overall n = 460	Men n = 166	Women n = 294	Overall n = 725	Men n = 259	Women n = 466
Extremely dissatisfied	19 (1.3)	4 (0.6)	15 (1.8)	2 (0.7)	1 (0.6)	1 (1.0)	3 (0.6)	1 (0.5)	2 (0.6)	15 (2.0)	2 (0.8)	13 (2.7)
Very dissatisfied	104 (7.2)	38 (6.6)	65 (7.6)	26 (10.2)	14 (8.6)	13 (12.7)	23 (5.0)	11 (6.4)	12 (4.2)	54 (7.5)	14 (5.4)	41 (8.7)
Somewhat dissatisfied	461 (31.9)	210 (36.0)	250 (29.2)	81 (31.4)	52 (32.5)	29 (29.4)	117 (25.4)	53 (32.1)	64 (21.7)	263 (36.2)	105 (40.6)	158 (33.8)
Somewhat satisfied	732 (50.7)	291 (49.7)	441 (51.4)	130 (50.3)	82 (51.1)	48 (48.9)	262 (56.8)	87 (52.6)	174 (59.3)	340 (46.9)	121 (46.9)	219 (46.9)
Very satisfied	114 (7.9)	37 (6.3)	77 (8.9)	18 (6.9)	12 (7.2)	6 (6.4)	47 (10.1)	11 (6.6)	36 (12.1)	49 (6.8)	14 (5.6)	35 (7.4)
Extremely satisfied	15 (1.0)	5 (0.8)	10 (1.1)	2 (0.6)	0	2 (1.6)	9 (2.0)	3 (1.8)	6 (2.2)	4 (0.5)	2 (0.7)	2 (0.4)
Somewhat, very, or extremely satisfied	861 (59.6)	333 (56.8)	528 (61.4)	150 (57.8)	94 (58.3)	56 (56.9)	318 (69.0)	101 (61.0)	216 (73.6)	393 (54.2)	138 (53.2)	255 (54.8)

Note: Numbers of individuals are weighted and rounded, and hence may not add up; percentages are based on the weighted "n" values.

Abbreviations: MUI, mixed urinary incontinence; SUI, stress urinary incontinence; UUI, urinary incontinence; UUI, urgency urinary incontinence.

^aP values were less than .05 within women and the overall group, indicating that the treatment patterns were significantly different between the symptom groups. For women and for men, treatment satisfaction levels differed significantly between symptom groups.

TABLE 5 Participant satisfaction with medication treatment

Treatment satisfaction	Any UI, n (%) ^a			UUI, n (%) ^a			SUI, n (%) ^a			MUI, n (%) ^a		
	Overall n = 693	Men n = 304	Women n = 389	Overall n = 140	Men n = 93	Women n = 46	Overall n = 200	Men n = 78	Women n = 122	Overall n = 353	Men n = 133	Women n = 220
Extremely dissatisfied	7 (1.0)	1 (0.3)	6 (1.5)	1 (0.7)	1 (1.0)	0	2 (0.8)	0	2 (1.4)	4 (1.2)	0	4 (1.9)
Very dissatisfied	37 (5.4)	16 (5.2)	21 (5.5)	10 (7.4)	6 (5.9)	5 (10.4)	9 (4.5)	5 (6.2)	4 (3.4)	18 (5.1)	6 (4.2)	12 (5.6)
Somewhat dissatisfied	218 (31.5)	100 (33.0)	118 (30.3)	40 (28.5)	31 (32.9)	9 (19.5)	37 (18.6)	16 (20.9)	21 (17.2)	141 (39.9)	53 (40.1)	88 (39.8)
Somewhat satisfied	382 (55.1)	171 (56.2)	211 (54.3)	80 (57.3)	50 (53.8)	30 (64.4)	131 (65.3)	51 (64.7)	80 (65.7)	171 (48.5)	70 (52.9)	101 (45.8)
Very satisfied	46 (6.7)	15 (5.0)	31 (8.0)	9 (6.2)	6 (6.4)	3 (5.7)	21 (10.7)	6 (8.2)	15 (12.3)	16 (4.5)	3 (2.1)	13 (6.0)
Extremely satisfied	3 (0.4)	1 (0.3)	2 (0.5)	0	0	0	0	0	0	3 (0.8)	1 (0.7)	2 (0.9)
Somewhat, very, or extremely satisfied	431 (62.2)	187 (61.5)	244 (62.8)	89 (63.5)	56 (60.2)	33 (70.2)	152 (76.0)	57 (72.9)	95 (78.1)	190 (53.8)	74 (55.7)	116 (52.7)

Note: Numbers of individuals are weighted and rounded, and hence may not add up; percentages are based on the weighted "n" values.

Abbreviations: MUI, mixed urinary incontinence; SUI, stress urinary incontinence; UUI, urgency urinary incontinence.

^aP values were less than .05 within women and the overall group, indicating that the treatment patterns were significantly different between the symptom groups; for women and for men, treatment satisfaction levels differed significantly between symptom groups.

differences, these Asian studies show the same general trend, with SUI predominating in women (18.0%-28.6%)^{10,12-14,30-32} and UUI/involuntary leakage predominating in men (1.9%-6.2%),^{11,31-33} similar to observations in studies conducted outside Asia.^{3,4} However, in our study, MUI prevalence was 9.7% and predominated in both men and women while the prevalence of SUI (10.7% in women vs 5.1% in men) was lower than in previous reports. Unexpectedly, a similar proportion of men reported UUI (5.5%) or SUI (5.1%), with only a slightly higher proportion (6.8%) reporting both subtypes. Although we may have expected more men with UUI than with SUI, UUI prevalence is consistent with previous estimates.

It is well known that UI increases with age and our data are broadly similar to those from many other Asian studies.^{9,13,29-31,33} In men, the increase was generally gradual, with the largest increase between the 55-59 year and ≥60 years age groups, particularly in those with SUI or MUI. In women, the most notable increases were from the 45-49 years to the 50-54 years and 55-59 years age groups in those with MUI, which is perhaps unsurprising as postmenopausal status has been shown to be a predictor of UI.¹⁰

Our results confirm that UI is a key component of LUTS that leads to poor physical and mental health. In the full survey population, LUTS prevalence was 61.2%²³ and in these individuals, mean physical and mental health domain scores were 61.1 and 34.8, respectively. Our data show that scores for those reporting UI were far worse (52.1 and 29.4, respectively) than those for participants without UI (71.2 and 40.7, respectively).³⁴ This negative association of UI with HRQoL and mental health is in accordance with worldwide studies such as EpiLUTS⁵ as well as studies from Asia.⁹⁻¹⁸ MUI in particular is generally reported as being the most detrimental to HRQoL/mental health while SUI is associated with the least impairment.^{10-12,14,17} The unpredictability of UUI has been suggested as a major factor for a poorer QoL with MUI and UUI, as those with SUI may be better able to adapt their lifestyle and avoid situations (such as heavy lifting or exercising) that lead to involuntary loss of urine.³⁵ Although we found the worst scores to be for those with MUI, overall scores for those with SUI or UUI were similar, with women with UUI being more severely affected than men, while men with SUI were more severely affected than women. However, the relationship between UI and mental health is complex and unclear, involving both pathophysiology and psychosocial components. Depression and anxiety may share a common neurochemical pathway with, and are risk factors for, UI.^{36,37} Conversely, the social embarrassment associated with UI or its impact on self-image in women may confer feelings of anxiety and could lead to social isolation and depression.^{5,8} Comparisons between the genders may be further confounded by different coping strategies in men and women.^{38,39}

In our analysis, 49.6% of participants with UI reported visiting HCPs within the previous 12 months, versus only 26% of participants with any LUTS.²³ Nevertheless, there is a widespread, inadequate understanding of UI and a lack of awareness of the potential for treatment or prevention.⁴⁰ In the Korean National Health and Nutrition Examination Survey (KHANES) IV, the consultation rate for UI was lower than in our study (1.2% in those aged ≥70 years, the age group

that sought most treatment).⁹ However, our dataset included very few respondents from Korea aged ≥ 70 years, which could account for the difference, along with possible differences in awareness and attitude toward UI between the studies. In Taiwan, despite the detrimental effect on QoL, only 27.1% of women with SUI, MUI, or overactive bladder sought medical attention for their symptoms.¹⁴ An increase in treatment-seeking behavior may be associated with poor QoL,¹⁷ a high level of education, previous treatment-seeking behavior⁴¹ and the presence of MUI (vs other types of UI).³² In our study, 62.7% of those with MUI visited HCPs about their urinary symptoms, more than double the proportion with SUI (30.4%) and approximately 50% more than those with UUI (41.6%). More men than women with any UI, SUI or MUI sought healthcare for any reason or for urinary symptoms. More women than men with UUI sought healthcare for any reason, with similar proportions seeking healthcare for urinary symptoms. Differences between the genders reported elsewhere are inconclusive.^{39,42,43}

Lack of treatment-seeking behavior may be due to the perception that UI is not a disease requiring medical intervention.¹⁷ Analyses of studies across different ethnic and cultural groups revealed that although perceptions of UI differed between certain populations, many women in different groups shared similar management strategies of pre-emptive voiding and limiting activities in public as well as preferring to discuss UI with other women rather than healthcare providers⁴⁴ and delayed seeking treatment.⁷ UI was considered an inevitable problem of pregnancy, childbirth and the normal aging process, causing women to hide their symptoms. Stigma (social rejection, social isolation and internalized shame) has also been associated with low levels of treatment-seeking.⁴⁵

Satisfaction with treatment ranges 37%–53% of participants in previous studies that evaluated UI therapies^{46,47} versus 59.6% in our study. Nevertheless, almost 40% of participants were dissatisfied with their treatment. Similarly, for those receiving prescribed medicine, almost 40% of overall participants were dissatisfied with their medication, with medication failing to satisfy around half of those with MUI. This is perhaps unsurprising given that in our population, MUI was the most prevalent subtype and had the worst reported effects on HRQoL and mental health.

The primary aim of the study was to assess prevalence of LUTS; analysis of UI was post hoc. However, UI is a subset of LUTS and the study benefited from a large sample size in addition to well-established and validated assessments that were translated into the local language. At the time of the study there was good internet penetration in South Korea (92%) and Taiwan (84%) with a lower penetration in China (~50%). Although our results are broadly similar to other studies, there are potential disadvantages associated with our survey that should be considered. As noted in the original publication, the use of a consumer panel is prone to volunteer bias and the lack of detailed demographic/geographic data prevented more detailed analysis of the results. It is also unknown whether results from those without internet access (likely to include older individuals and those in more rural regions) would be different from those described in the present analysis. The online questions were interpreted by

participants and were self-reports without a HCP interviewer and with no clinical or medical diagnosis. Nevertheless, this approach had the advantage of avoiding potential embarrassment answering questions of a sensitive nature. Inconsistencies in demographic characteristics, such as differences between the genders, may have been confounding influences.

In conclusion, both men and women with UI experience substantial problems, including an adverse impact on HRQoL and mental health. Treatment-seeking for UI is generally higher than for other LUTS, but there remains room for improvement and medication fails to satisfy a large proportion of those with UI, particularly those with MUI. Efforts to reduce the embarrassment and social stigma associated with UI in some patient populations and education of the public and physicians about the impact of UI could improve diagnosis and treatment rates.

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DISCLOSURE

Jian-Ye Wang, Limin Liao, Kyu-Sung Lee, Tag Keun Yoo, Shih-Ping Liu, and Yao-Chi Chuang have all acted as consultants for Astellas during a meeting to discuss the publications from the original study. Tag Keun Yoo has received grants and personal fees from Astellas to act as a consultant to Astellas. Budiwan Sumarsono is an employee of Astellas Pharma Inc., and Jar Jar Jong was an employee of Astellas Pharma Inc. at the time of this analysis.

Researchers may request access to anonymized participant level data, trial level data and protocols from Astellas sponsored clinical trials at www.clinicalstudydatarequest.com. For the Astellas criteria on data sharing see: <https://clinicalstudydatarequest.com/Study-Sponsors/Study-Sponsors-Astellas.aspx>.

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REFERENCES

1. Abrams P, Cardozo L, Fall M, et al. The standardisation of terminology of lower urinary tract function: report from the standardisation subcommittee of the International Continence Society. *Neurourol Urodyn*. 2002;21(2):167-178.
2. Haylen BT, de Ridder D, Freeman RM, et al. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. *Int Urogynecol J*. 2010;21(1):5-26.
3. Aoki Y, Brown HW, Brubaker L, Cornu JN, Daly JO, Cartwright R. Urinary incontinence in women. *Nat Rev Dis Primers*. 2017;3:17042.
4. Tikkinen KA, Agarwal A, Griebing TL. Epidemiology of male urinary incontinence. *Curr Opin Urol*. 2013;23(6):502-508.

5. Coyne KS, Kvasz M, Ireland AM, Milsom I, Kopp ZS, Chapple CR. Urinary incontinence and its relationship to mental health and health-related quality of life in men and women in Sweden, the United Kingdom, and the United States. *Eur Urol.* 2012;61(1):88-95.
6. Irwin DE, Kopp ZS, Agatep B, Milsom I, Abrams P. Worldwide prevalence estimates of lower urinary tract symptoms, overactive bladder, urinary incontinence and bladder outlet obstruction. *BJU Int.* 2011;108(7):1132-1138.
7. Mendes A, Hoga L, Goncalves B, Silva P, Pereira P. Adult women's experiences of urinary incontinence: a systematic review of qualitative evidence. *JBI Database System Rev Implement Rep.* 2017;15(5):1350-1408.
8. Odium M, Davis N, Owens O, Preston M, Brewer R, Black D. Correlates and aetiological factors associated with hedonic well-being among an ageing population of US men and women: secondary data analysis of a national survey. *BMJ Open.* 2018;8(11):e020962.
9. Kwon CS, Lee JH. Prevalence, risk factors, quality of life, and health-care seeking behaviors of female urinary incontinence: results from the 4th Korean National Health and Nutrition Examination Survey VI (2007-2009). *Int Neurourol J.* 2014;18(1):31-36.
10. Tsai YC, Liu CH. Urinary incontinence among Taiwanese women: an outpatient study of prevalence, comorbidity, risk factors, and quality of life. *Int Urol Nephrol.* 2009;41(4):795-803.
11. Park HK, Chang S, Palmer MH, Kim I, Choi H. Assessment of the impact of male urinary incontinence on health-related quality of life: a population based study. *Low Urin Tract Symptoms.* 2015;7(1):22-26.
12. Choo MS, Ku JH, Oh SJ, et al. Prevalence of urinary incontinence in Korean women: an epidemiologic survey. *Int Urogynecol J Pelvic Floor Dysfunct.* 2007;18(11):1309-1315.
13. Horng SS, Huang N, Wu SI, Fang YT, Chou YJ, Chou P. The epidemiology of urinary incontinence and its influence on quality of life in Taiwanese middle-aged women. *NeurourolUrodyn.* 2013;32(4):371-376.
14. Chen GD, Lin TL, Hu SW, Chen YC, Lin LY. Prevalence and correlation of urinary incontinence and overactive bladder in Taiwanese women. *NeurourolUrodyn.* 2003;22(2):109-117.
15. Lee KS, Choo MS, Seo JT, et al. Impact of overactive bladder on quality of life and resource use: results from Korean Burden of Incontinence Study (KOBIS). *Health Qual Life Outcomes.* 2015;13:89.
16. Xu D, Liu N, Qu H, Chen L, Wang K. Relationships among symptom severity, coping styles, and quality of life in community-dwelling women with urinary incontinence: a multiple mediator model. *Qual Life Res.* 2016;25(1):223-232.
17. Yu HJ, Wong WY, Chen J, Chen WC. Quality of life impact and treatment seeking of Chinese women with urinary incontinence. *Qual Life Res.* 2003;12(3):327-333.
18. Lim YM, Lee SR, Choi EJ, Jeong K, Chung HW. Urinary incontinence is strongly associated with depression in middle-aged and older Korean women: data from the Korean longitudinal study of ageing. *Eur J Obstet Gynecol Reprod Biol.* 2018;220:69-73.
19. Cheung RY, Chan S, Yiu AK, Lee LL, Chung TK. Quality of life in women with urinary incontinence is impaired and comparable to women with chronic diseases. *Hong Kong Med J.* 2012;18(3):214-220.
20. Hannestad YS, Rortveit G, Hunskaar S. Help-seeking and associated factors in female urinary incontinence. The Norwegian EPINCONT Study. Epidemiology of incontinence in the county of Nord-Trøndelag. *Scand J Prim Health Care.* 2002;20(2):102-107.
21. O'Donnell M, Lose G, Sykes D, Voss S, Hunskaar S. Help-seeking behaviour and associated factors among women with urinary incontinence in France, Germany, Spain and the United Kingdom. *Eur Urol.* 2005;47(3):385-392. discussion 92.
22. Kalder M, Pantazis K, Dinas K, Albert US, Heilmaier C, Kostev K. Discontinuation of treatment using anticholinergic medications in patients with urinary incontinence. *Obstet Gynecol.* 2014;124(4):794-800.
23. Chapple C, Castro-Diaz D, Chuang Y-C, et al. Prevalence of LUTS in China, Taiwan and South Korea: results from a cross-sectional, population-based study. *Adv Ther.* 2017;34(8):1953-1965.
24. European Society for Opinion and Marketing Research. ESOMAR guideline for online research. https://www.esomar.org/uploads/public/knowledge-and-standards/codes-and-guidelines/ESOMAR_Guideline-for-online-research.pdf. Updated August 2011. Accessed December 5, 2018.
25. Ware J Jr, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care.* 1996;34(3):220-233.
26. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand.* 1983;67(6):361-370.
27. Chow PM, Liu SP, Chuang YC, et al. The prevalence and risk factors of nocturia in China, South Korea, and Taiwan: results from a cross-sectional, population-based study. *World J Urol.* 2018;36(11):1853-1862.
28. Bedretdinova D, Fritel X, Panjo H, Ringa V. Prevalence of female urinary incontinence in the general population according to different definitions and study designs. *Eur Urol.* 2016;69(2):256-264.
29. Chen YC, Ng SC, Chen SL, Huang YH, Hu SW, Chen GD. Overactive bladder in Taiwanese women: re-analysis of epidemiological database of community from 1999 to 2001. *Neurourol Urodyn.* 2012;31(1):56-59.
30. Zhang L, Zhu L, Xu T, et al. A population-based survey of the prevalence, potential risk factors, and symptom-specific bother of lower urinary tract symptoms in adult Chinese women. *Eur Urol.* 2015;68(1):97-112.
31. Wang Y, Hu H, Xu K, Wang X, Na Y, Kang X. Prevalence, risk factors and the bother of lower urinary tract symptoms in China: a population-based survey. *Int Urogynecol J.* 2015;26(6):911-919.
32. Lee YS, Lee KS, Jung JH, et al. Prevalence of overactive bladder, urinary incontinence, and lower urinary tract symptoms: results of Korean EPIC study. *World J Urol.* 2011;29(2):185-190.
33. Kim TH, Han DH, Lee KS. The prevalence of lower urinary tract symptoms in Korean men aged 40 years or older: a population-based survey. *Int Neurourol J.* 2014;18(3):126-132.
34. Lee KS, Yoo TK, Liao L, et al. Association of lower urinary tract symptoms and OAB severity with quality of life and mental health in China, Taiwan and South Korea: results from a cross-sectional, population-based study. *BMC Urol.* 2017;17(1):108.
35. Simeonova Z, Milsom I, Kullendorff AM, Molander U, Bengtsson C. The prevalence of urinary incontinence and its influence on the quality of life in women from an urban Swedish population. *Acta Obstet Gynecol Scand.* 1999;78(6):546-551.
36. Steers WD, Lee KS. Depression and incontinence. *World J Urol.* 2001;19(5):351-357.
37. Felde G, Ebbesen MH, Hunskaar S. Anxiety and depression associated with urinary incontinence. A 10-year follow-up study from the Norwegian HUNT study (EPINCONT). *Neurourol Urodyn.* 2017;36(2):322-328.
38. Bauer RM, Huebner W. Gender differences in bladder control: from babies to elderly. *World J Urol.* 2013;31(5):1081-1085.
39. Bilgic D, Kizilkaya Beji N, Ozbas A, Cavdar I, Aslan E, Yalcin O. Coping and help-seeking behaviors for management of urinary incontinence. *Low Urin Tract Symptoms.* 2017;9(3):134-141.
40. Vasconcelos CTM, Firmiano MLV, Oria MOB, Vasconcelos Neto JA, Saboia DM, Bezerra L. Women's knowledge, attitude and practice related to urinary incontinence: systematic review. *Int Urogynecol J.* 2019;30(2):171-180.
41. Xu D, Wang X, Li J, Wang K. The mediating effect of 'bothersome' urinary incontinence on help-seeking intentions among community-dwelling women. *J Adv Nurs.* 2015;71(2):315-325.
42. Li Y, Cai X, Glance LG, Mukamel DB. Gender differences in healthcare-seeking behavior for urinary incontinence and the impact

- of socioeconomic status: a study of the Medicare managed care population. *Med Care*. 2007;45(11):1116-1122.
43. Teunissen D, Lagro-Janssen T. Urinary incontinence in community dwelling elderly: are there sex differences in help-seeking behaviour? *Scand J Prim Health Care*. 2004;22(4):209-216.
44. Siddiqui NY, Levin PJ, Phadtare A, Pietrobon R, Ammarell N. Perceptions about female urinary incontinence: a systematic review. *Int Urogynecol J*. 2014;25(7):863-871.
45. Wang C, Li J, Wan X, Wang X, Kane RL, Wang K. Effects of stigma on Chinese women's attitudes towards seeking treatment for urinary incontinence. *J Clin Nurs*. 2015;24(7-8):1112-1121.
46. Campbell UB, Stang P, Barron R. Survey assessment of continuation of and satisfaction with pharmacological treatment for urinary incontinence. *Value Health*. 2008;11(4):726-732.
47. Sussman D, Patel V, Del Popolo G, Lam W, Globe D, Pommerville P. Treatment satisfaction and improvement in health-related quality of life with onabotulinumtoxinA in patients with urinary incontinence due to neurogenic detrusor overactivity. *NeuroUrol Urodyn*. 2013;32(3):242-249.

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