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The impact of urinary incontinence on quality of life among women in Hong Kong

小便失禁對香港女性的生活素質的影響

Objective. To determine the prevalence of female urinary incontinence in Hong Kong and its impact on quality of life.

Design and setting. Territory-wide telephone survey in Hong Kong.

Participants. Hong Kong women aged 10 to 90 years accessed by fixed residential telephone lines between June 2001 and July 2002.

Main outcome measures. The prevalence of urinary symptoms was assessed using telephone interview. The urinary symptoms investigated were as listed in a validated Chinese version of Urogenital Distress Inventory Short Form (UDI-6). The impact on quality of life was quantified using a validated Chinese version of Incontinence Impact Questionnaire Short Form (IIQ-7).

Results. There were 749 valid respondents (response rate, 24.4%). Urinary symptoms were reported by 52% of women (95% confidence interval, 48.9-56.0%), of whom 12% believed it impaired their quality of life. Stress urinary incontinence was reported by 34% (95% confidence interval, 28.7-38.9%). Social (5.1%; 95% confidence interval, 2.8-7.4%) and emotional (5.6%; 95% confidence interval, 3.3-7.9%) factors were the quality-of-life areas most impacted by urinary incontinence.

Conclusions. Urinary symptoms are common among Hong Kong women. Quality of life is consequently impaired in 12% of affected women.

Key words:

Female;
Prevalence;
Quality of life;
Urinary incontinence

關鍵詞：

女性；
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目的：確定香港女性患尿失禁的普遍程度及其對生活素質的影響。

設計：全港性電話調查。

安排：香港。

參與者：2001年6月至2002年7月期間，以本地固網電話聯絡到的10至90歲香港女性。

主要結果測量：採用一個認可的泌尿系統不適症狀中文簡表(UDI-6)，以電話訪談調查有泌尿系統症狀的普遍程度。另以一個調查尿失禁影響的認可中文問卷簡表(IIQ-7)來數量化其對生活素質的影響。

結果：有效的回應共有749位(回應率為24.4%)，52%報稱出現泌尿系統不適的症狀(95%可信區間為48.9-56.0%)，當中12%認為不適症狀使生活素質降低。34%報稱尿失禁由腹內壓力增加引致(95%可信區間為28.7-38.9%)。受尿失禁影響最大的生活素質範圍分別是社交(5.1%；95%可信區間為2.8-7.4%)和情緒(5.6%；3.3-7.9%)兩方面。

結論：香港女性患尿失禁的情況相當普遍，當中有12%的生活素質因為該症而下降。

Introduction

Female urinary incontinence is a major health problem: the prevalence of urinary incontinence in a community-dwelling population ranges from

17% to 55%.¹ Urinary incontinence affects many areas of an individual's life including social, domestic, occupational, and leisure activities.^{2,3} Reports of interference in social activities range from 8% to 52%.^{2,3} Relationships with family members are also affected⁴: 9% to 48% of incontinent women report sexual difficulties.^{3,5} Incontinent women also suffer significant anxiety and depression.⁶

Although urinary incontinence is associated with psychosocial morbidity, the perception of the severity of symptoms and hence its influence on daily life may not be directly related to the amount or frequency of urine loss.⁷ It is the degree of impairment of quality of life (QOL) that determines whether a patient seeks medical treatment. Prevalence data relating to the symptoms of urinary incontinence are inadequate when used in isolation to assess health needs and to plan health care services. Therefore, an assessment of the effects on QOL is also vital.

Many western studies have assessed the QOL of women suffering from urinary incontinence, but in most cases QOL was not measured using validated psychometric questionnaires.⁸ In a minority of studies where the assessment of the QOL was quantified by validated questionnaires, only general or generic QOL questionnaires were used.⁸ Such questionnaires are designed to measure the functioning and well-being of the general population, and are not specific to patients suffering from urinary incontinence. They lack sensitivity to the unique aspects of urinary incontinence.⁹ Thus the impact of urinary incontinence on QOL may not be properly assessed.

Incontinence-specific QOL questionnaires have recently been developed that provide a more thorough assessment of the impact of urinary incontinence.¹⁰⁻¹² They also have greater sensitivity over time, and are thus useful for monitoring changes before and after treatment.¹²

In the Hong Kong Chinese population, there is limited research to quantify the impairment of QOL in women by urinary incontinence.¹³ In particular, the QOL impact on community-dwelling incontinent women is unknown. This study aimed to evaluate the impact of urinary incontinence on QOL in the general Chinese female population of Hong Kong.

Methods

A territory-wide telephone survey using psychometric questionnaires was carried out between June 2001 to

July 2002 following ethical approval by the Chinese University of Hong Kong Ethics Committee. The target population resided in the territory of Hong Kong. There were 2.8 million females older than 10 years of age in 2001.¹⁴ Hong Kong is a highly urbanised city: the estimated number of telephone lines in 2000 was 68.2 per 100 residents.¹⁵ A telephone survey is thus able to reach a study population that is representative of the overall population of Hong Kong.

A computer program randomly selected telephone numbers from each of the territory's three telephone directories of fixed residential lines in the regions of Hong Kong Island, Kowloon, and the New Territories. The telephone number list was obtained with the assistance of the Telephone Survey Research Laboratory, the Hong Kong Institute of Asia-Pacific Studies, and the Chinese University of Hong Kong. All telephone interviews were conducted by research nurses.

Interviews were conducted between 9am and 9pm on working days. Each telephone number was dialed 6 times at different time slots (9am-11am, 11am-1pm, 1pm-3pm, 3pm-5pm, 5pm-7pm, 7pm-9pm) before it was considered a failed contact. It has been shown that this selection method will yield a representative sample of employed and unemployed respondents.^{16,17}

The research nurses were trained in survey techniques and their reliability in interviewing techniques confirmed. A pilot study on 50 subjects was performed to ensure their skills in achieving subject cooperation.

The validated Chinese versions of Urogenital Distress Inventory Short Form (UDI-6), and Incontinence Impact Questionnaire Short Form (IIQ-7) were used.¹⁸ The UDI-6 was chosen to establish the prevalence and symptomatology of urinary incontinence, whereas the IIQ-7 assessed QOL related specifically to urinary incontinence.

The questionnaires

We have validated the Chinese versions of UDI-6 and IIQ-7.¹⁸ Both are incontinence-specific psychometric questionnaires. The first questionnaire (UDI-6) is a six-item questionnaire that assesses the life impact of urinary symptoms: frequent urination, urge incontinence, stress incontinence, urinary leakage, difficulty in emptying the bladder, and pain. It has a Likert-style scale: not at all, slightly, moderately, and greatly. Specific items in UDI-6 may provide predictive information regarding urodynamic findings in female subjects.¹⁹

The second questionnaire (IIQ-7) is a seven-item questionnaire designed to assess different domains of QOL impairment. The domains evaluated are: travelling far from home, social activities, emotional health, entertainment activities, household chores, feelings of frustration, and physical recreation.¹¹ It has a four-point rating scale: 0=not at all, 1=slightly, 2=moderately, and 3=greatly; thus a composite score can be computed with higher score indicating poorer QOL. The total and subscale scores for both UDI-6 and IIQ-7 correlated well with their long-form versions.^{11,12}

Data analysis and sample size

The prevalence of urinary symptoms and QOL impact were summarised using descriptive statistics. To determine the prevalence throughout Hong Kong, all age-groups and geographical regions were included.

The reported prevalence of female incontinence is around 20% in Hong Kong.^{16,17} Assuming this study would yield a similar prevalence, a sample size of 749 subjects would produce a 95% confidence interval (95% CI) equal to the estimated prevalence with $\pm 3\%$ margin of error. This calculation of sample size was based on the precision of estimating a sample proportion.²⁰ Pass version 2000 (NCSS Inc., Kaysville [UT], US) was used to calculate the sample size required.

In order to examine whether our study population was representative of the Hong Kong female population, the study population was compared with the female population from the Hong Kong Census 2001.¹⁴ The comparison used Chi squared test for goodness-of-fit with a known distribution to test how well the sample represents its parent population.²¹ Statistical analyses were performed using Statistical Package for Social Sciences for Windows version 10 (SPSS Inc, Chicago [IL], US). A P value of less than 0.05 was considered statistically significant.

Results

Response to telephone survey

From June 2001 to July 2002, 5892 telephone numbers were dialled to contact potential subjects. There were 749 (13%) valid respondents, 1472 (25%) invalid lines, 1355 (23%) failed contacts, 818 (14%) inappropriate subjects, and 1498 (25%) refusals to respond. The overall response rate was 24.4% (749/3065).

The overall prevalence of stress urinary incontinence was 33.8% (95% CI, 28.7-38.9). With a sample size of 749 valid respondents, the power analysis showed an error of $\pm 3\%$.

Table 1. Comparison of age distribution between survey subjects and Hong Kong population in 2001*

Age-group (years)	Hong Kong female population in 2001, n=3 357 050 (% of total female population)	Survey responders (female), n=746 [†] (% of total survey respondents)
10-14	6.1	2.4
15-19	6.2	7.6
20-24	7.1	7.2
25-29	8.4	7.2
30-34	9.6	9.7
35-39	10.9	11.4
40-44	10.0	13.0
45-49	7.7	9.0
50-54	6.0	10.5
55-59	3.3	4.4
60-64	3.4	6.7
65-69	3.5	3.1
≥ 70	8.2	7.8

* $\chi^2=42.0$ (Chi squared test for goodness-of-fit with a known distribution), P=0.23

[†] Only 746 of 749 valid respondents had age data

Representation of the study population

Comparison using Chi squared test between the study population and the female population from the Hong Kong Census 2001, after stratification by age, showed that the overall goodness-of-fit between them was good (P=0.23) [Table 1].

Urinary problems

Prevalence of urinary symptoms

At least one of the urinary symptoms assessed by UDI-6 was reported by 52% (393/749; 95% CI, 48.9-56.0%) of the surveyed women. Of these, 13% (95% CI, 9.9-16.6%) reported pure stress urinary incontinence (SUI), and 15.5% (95% CI, 12.4-18.6%) reported urge incontinence. The frequency of positive responses to individual urinary symptoms and the subjective rating of the severity of each urinary symptom are shown in Table 2.

The prevalence of individual urinary symptoms in each age-group is presented in Table 3.

Effects of urinary problems on quality of life

Impaired QOL indicated by the results of IIQ-7 was reported by 11.7% (46/393; 95% CI, 8.5-14.9%) of subjects who reported urinary symptoms. The frequency of distribution of the different domains of QOL impairment and the stratification according to patient-graded severity is shown in Table 4. The most frequently reported domains of impairment were social activity and emotional well-being.

In subjects with pure SUI, 8.5% (8/94; 95% CI,

Table 2. Prevalence of urinary symptoms in the study population and the severity of symptoms

Urinary symptom	Severity of symptom			Overall (n=749)
	Slightly	Moderately	Greatly	
Frequency				
No. (%)	111 (14.8)	30 (4.0)	3 (0.4)	144 (19.2)
95% CI*	11.8-17.8	2.5-5.5	0-0.9	15.7-22.7
Urge incontinence				
No. (%)	103 (13.8)	11 (1.5)	2 (0.3)	116 (15.5)
95% CI	10.9-16.7	0.6-2.4	0-0.7	12.4-18.6
Stress incontinence				
No. (%)	234 (31.2)	17 (2.3)	2 (0.3)	253 (33.8)
95% CI	26.4-36.0	1.2-3.4	0-0.7	28.7-38.9
Urinary leakage				
No. (%)	139 (18.6)	5 (0.7)	0	144 (19.2)
95% CI	15.2-22.0	0.1-1.3	-	15.7-22.7
Voiding difficulty				
No. (%)	50 (6.7)	5 (0.7)	2 (0.3)	57 (7.6)
95% CI	4.8-8.6	0.1-1.3	0-0.7	5.5-9.7
Dysuria				
No. (%)	109 (14.6)	16 (2.1)	3 (0.4)	128 (17.1)
95% CI	11.6-17.6	1.1-3.1	0-0.9	13.8-20.4

* CI confidence interval

Table 3. Prevalence of urinary symptoms in different age-groups

Urinary symptom	Age (years)							Overall† (n=746)
	10-19 (n=75)	20-29 (n=108)	30-39 (n=157)	40-49 (n=164)	50-59 (n=111)	60-69 (n=73)	≥70 (n=58)	
Frequency								
No. (%)	9 (12.0)	11 (10.2)	27 (17.2)	26 (15.9)	28 (25.2)	17 (23.3)	26 (44.8)	144 (19.3)
95% CI*	7.0-20.0	3.8-16.6	10.0-24.0	9.0-22.6	14.4-36.0	10.6-35.8	22.0-68.0	15.7-22.7
Urge incontinence								
No. (%)	5 (6.7)	7 (6.5)	22 (14.0)	26 (15.9)	24 (21.6)	15 (20.5)	17 (29.3)	116 (15.5)
95% CI	0.6-12.8	1.5-11.5	7.7-20.3	9.2-22.6	11.8-31.4	8.9-32.1	12.7-45.9	12.4-18.6
Stress incontinence								
No. (%)	8 (10.7)	12 (11.1)	46 (29.3)	73 (44.5)	61 (55.0)	24 (32.9)	29 (50.0)	253 (33.9)
95% CI	2.9-18.5	4.4-17.8	19.2-39.4	30.8-58.2	34.4-75.6	16.8-49.0	24.0-75.7	28.7-38.9
Urinary leakage								
No. (%)	10 (13.3)	16 (14.8)	28 (17.8)	33 (20.1)	29 (26.1)	13 (17.8)	14 (24.1)	143 (19.2)
95% CI	4.4-22.2	6.9-22.7	10.5-25.1	12.4-27.8	15.0-37.2	7.1-28.5	9.6-38.6	15.7-22.7
Voiding difficulty								
No. (%)	1 (1.3)	4 (3.7)	10 (6.4)	11 (6.7)	9 (8.1)	8 (11.0)	14 (24.1)	57 (7.6)
95% CI	0-3.9	0-7.4	2.3-10.5	2.6-10.8	2.6-13.6	2.9-19.1	9.6-38.6	5.5-9.7
Dysuria								
No. (%)	6 (8.0)	17 (15.7)	23 (14.6)	41 (25.0)	23 (20.7)	7 (9.6)	11 (19.0)	128 (17.2)
95% CI	1.2-14.7	7.6-23.8	8.1-21.1	16.2-33.8	11.2-30.2	2.1-17.1	6.5-31.5	13.8-20.4

* CI confidence interval

† Only 746 of 749 valid respondents had age data

5.6-11.4%) reported impaired QOL compared with 19.8% (23/116; 95% CI, 10.8-28.8%) of subjects with urge incontinence. The difference was statistically significant (odds ratio=2.7; 95% CI, 1.1-6.3%).

Discussion

More than half of the women interviewed reported urinary symptoms, the most common being SUI

(33.8%; 95% CI, 28.7-38.9%). Impaired QOL, as assessed by IIQ-7, was reported by 11.7% (95% CI, 8.5-14.9%).

The information obtained from this survey defines the significance of female urinary incontinence in the Hong Kong population. A previous population-based study of urinary incontinence focused on the prevalence of urinary symptoms without addressing the

Table 4. Impairment of quality of life among subjects with urinary symptoms using Incontinence Impact Questionnaire Short Form (IIQ-7)

Questions in IIQ-7	Severity of symptom			Overall (n=393)
	Slightly	Moderately	Greatly	
Q1: Ability to do household chores				
No. (%)	15 (3.8)	3 (0.8)	0	18 (4.6)
95% CI*	1.8-5.8	0-1.7	-	2.5-6.7
Q2: Physical recreation				
No. (%)	17 (4.3)	2 (0.5)	0	19 (4.8)
95% CI	2.2-6.4	0-1.2	-	2.7-7.0
Q3: Entertainment activities				
No. (%)	10 (2.5)	1 (0.3)	0	11 (2.8)
95% CI	1.0-4.2	0-0.8	-	1.1-4.5
Q4: Ability to travel by car or by bus for more than 30 minutes				
No. (%)	10 (2.5)	1 (0.3)	0	11 (2.8)
95% CI	1.0-4.2	0-0.8	-	1.1-4.5
Q5: Participating in social activities outside your home				
No. (%)	16 (4.1)	3 (0.8)	1 (0.3)	20 (5.1)
95% CI	2.1-6.1	0-1.7	0-0.8	2.8-7.4
Q6: Emotional health				
No. (%)	20 (5.1)	2 (0.5)	0	22 (5.6)
95% CI	2.8-7.4	0-1.2	-	3.3-7.9
Q7: Feeling frustrated				
No. (%)	11 (2.8)	1 (0.3)	0	12 (3.1)
95% CI	1.1-4.5	0-0.8	-	1.4-4.8

* CI confidence interval

impact of the disease.¹⁷ A previous study that did include an assessment of QOL was restricted to selected groups of women and not the whole female population.¹³ A telephone survey allowed access to a representative sample of the entire female population. It was also possible to interview women who were at work. The comparison of the age distribution of the study population and the population census showed that there was an acceptable goodness-of-fit.

We previously reported a 21% incidence of SUI in 1996.¹⁶ Incontinence 'incapacitated' 4% of women in another survey.¹⁷ This study found a 33.8% incidence of SUI. It is unclear why there has been such an increase. Statistical comparison of the age and parity distribution of the respondents in 1996 with the present study shows no significant differences (age distribution: $\chi^2=154.0$, $P=0.27$; parity distribution: $\chi^2=12.0$, $P=0.21$). The increase may be due to increased awareness of the problem with more people seeking treatment, rather than significant changes in medical practice or demographic characteristics over a relatively short period of time. Further epidemiological studies may shed more light on the subject.

Impairment in social activity (5.1%) and emotional well-being (5.6%) are the two most frequently reported domains of QOL affected. Women with urge incontinence reported a higher incidence of QOL

impairment than those with pure SUI. This observation is consistent with the results of other studies that showed patients with detrusor overactivity had worse psychometric outcomes than those with urodynamic stress incontinence.^{22,23}

The two questionnaires (UDI-6 and IIQ-7) were selected for this study because of their ease of administration in a telephone survey. Other incontinence-specific questionnaires, for example SEAPI QMM Incontinence Classification System or King's Health Questionnaire, are designed for self-reporting or to be administered during a personal interview. This may be too long or too complex for a telephone interview.^{10,24}

The non-significant Chi squared test for goodness-of-fit indicates that this study population was representative of the female population in Hong Kong. Such assessment of representation is vital for a population survey, in particular one that is conducted by telephone. Although the telephone numbers were randomly selected, there was no objective means of controlling who answered the phone or completed the interview. Subject bias could have been introduced. In order to ensure the quality of the data obtained, a post hoc assessment of the study population's representation is therefore necessary.²⁰

This study was limited by the lack of an in-depth assessment of specific aspects of QOL, especially sexual, social, marital, and family factors. Marital relationships and sexual function were negatively affected among women suffering from urodynamic stress incontinence or detrusor overactivity.²³ However, such information among community-dwelling incontinent women is lacking. Although our results support the notion that urinary incontinence has a negative QOL impact on the general female population, the extent, mechanisms, and implications of the impact have not been addressed. The design of the telephone survey allows only a short interview time, thus in-depth psychometric assessment is not feasible. A community survey using appropriate psychometric questionnaires administered through a face-to-face interview would address this problem.

In conclusion, urinary incontinence is common among Hong Kong women: 12% of the affected women have QOL impaired due to it.

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References

1. Thom D. Variation in estimates of urinary incontinence prevalence in the community: effects of differences in definition, population characteristics, and study type. *J Am Geriatr Soc* 1998;46:473-80.
2. Norton PA. Prevalence and social impact of urinary incontinence in women. *Clin Obstet Gynecol* 1990;33:295-7.
3. Norton PA, MacDonald LD, Sedgwick PM, Stanton SL. Distress and delay associated with urinary incontinence, frequency, and urgency in women. *BMJ* 1988;297:1187-9.
4. Breakwell SL, Walker SN. Differences in physical health, social interaction, and personal adjustment between continent and incontinent homebound aged women. *J Community Health Nurs* 1988;5:19-31.
5. Sutherst JR. Sexual dysfunction and urinary incontinence. *Br J Obstet Gynaecol* 1979;86:387-8.
6. Dugan E, Cohen SJ, Bland DR, et al. The association of depressive symptoms and urinary incontinence among older adults. *J Am Geriatr Soc* 2000;48:413-6.
7. Robinson D, Pearce KF, Preisser JS, Dugan E, Suggs PK, Cohen SJ. Relationship between patient reports of urinary incontinence symptoms and quality of life measures. *Obstet Gynecol* 1998;92:224-8.
8. Harris A. Impact of urinary incontinence on the quality of life of women. *Br J Nurs* 1999;8:375-80.
9. Bowling A. Health-related quality of life: a discussion of the concept, its use and measurement. In: Bowling A. *Measuring disease*. Buckingham: Open University Press; 1995:1-19.
10. Kelleher CJ, Cardozo LD, Khullar V, Salvatore S. A new questionnaire to assess the quality of life of urinary incontinent women. *Br J Obstet Gynaecol* 1997;104:1374-9.
11. Uebersax JS, Wyman JF, Shumaker SA, McClish DK, Fantl JA. Short forms to assess life quality and symptom distress for urinary incontinence in women: the Incontinence Impact Questionnaire and the Urogenital Distress Inventory. *Continence Program for Women Research Group. NeuroUrol Urodyn* 1995;14:131-9.
12. Shumaker SA, Wyman JF, Uebersax JS, McClish D, Fantl JA. Health-related quality of life measures for women with urinary incontinence: the Incontinence Impact Questionnaire and the Urogenital Distress Inventory. *Continence Program in Women (CPW) Research Group. Qual Life Res* 1994;3:291-306.
13. Yu HJ, Wong WY, Chen J, Chie WC. Quality of life impact and treatment seeking of Chinese women with urinary incontinence. *Qual Life Res* 2003;12:327-33.
14. 2001 population census – main tables. Hong Kong SAR Government: Census and Statistics Department; 2001:2.
15. Five-year statistics 2003. Hong Kong: Cable and Wireless HKT Ltd; 2003.
16. Brieger GM, Yip SK, Chung TK. The prevalence of urinary dysfunction in Hong Kong Chinese women. *Obstet Gynecol* 1996;88:1041-4.
17. Breiger GM, Mongelli M, Hin LY, Chung TK. The epidemiology of urinary dysfunction in Chinese women. *Int Urogynecol J Pelvic Floor Dysfunction* 1997;8:191-5.
18. Leung HY, Yip SK, Lee TS, Ho S, Chung TK. Quality of life measurements in Chinese women with urinary incontinence: a reliability, responsiveness and validity study. Report: Health Services Research Committee; 2001 Dec. Report No. MD20003.
19. Lemack GE, Zimmern PE. Predictability of urodynamic findings based on the Urogenital Distress Inventory-6 questionnaire. *Urology* 1999;54:461-6.
20. Kelsey JL, Whittemore AS, Evans AS, Douglas TW. *Methods in observed epidemiology*. 2nd ed. New York: Oxford University Press; 1996:311-40.
21. Portney LG, Watkins MP. *Foundations of clinical research. Applications to practice*. 2nd ed. Upper Saddle River: Prentice Hall Health; 2000:539-43.
22. Coyne KS, Zhou Z, Thompson C, Versi E. The impact on health-related quality of life of stress, urge and mixed urinary incontinence. *BJU Int* 2003;92:731-5.
23. Yip SK, Chan A, Pang S, et al. The impact of urodynamic stress incontinence and detrusor overactivity on marital relationship and sexual function. *Am J Obstet Gynecol* 2003;188:1244-8.
24. Raz S, Erikson DR. SEAPI QMM Incontinence Classification System. *NeuroUrol Urodyn* 1992;11:187-9.