Urinary Incontinence of Women in a Nationwide Study in Sri Lanka: Prevalence and Risk Factors

Ramya Pathiraja[1], Shamini Prathapan[2*], Sampatha Goonawardena[2]

Purpose: Urinary incontinence, be stress incontinence or urge incontinence or a mixed type incontinence affects women of all ages. The aim of this study was to describe the prevalence and risk factors of urinary incontinence in Sri Lanka.

Materials and Methods: A community based cross-sectional study was performed in Sri Lanka. The age group of the women in Sri Lanka was categorized into 3 age groups: Less than or equal to 35 years, 36 to 50 years of age and more than or equal to 51 years of age. A sample size of 675 women was obtained from each age category obtaining a total sample of 2025 from Sri Lanka. An interviewer-administered questionnaire consisting of two parts; Socio demographic factors, Medical and Obstetric History, and the King's Health Questionnaire (KHQ), was used for data collection. Stepwise logistic regression analysis was performed.

Results: The Prevalence of women with only stress incontinence was 10%, with urge incontinence was 15.6% and with stress and urge incontinence was 29.9%. Stepwise logistic regression analysis showed that the age groups of 36 – 50 years (OR = 2.03; 95% CI = 1.56 - 2.63) and 51 years and above (OR = 2.61; 95% CI= 1.95 – 3.48), Living in one of the districts in Sri Lanka (OR = 4.58; 95% CI = 3.35 – 6.27) and having given birth to multiple children (OR = 1.1; 95% CI = 1.02 – 1.21), diabetes mellitus (OR = 1.97; 95% CI = 1.19 - 3.23), and respiratory diseases (OR = 2.17; 95% CI = 1.48 - 3.19) showed a significant risk in the regression analysis.

Conclusion: The risk factor, mostly modifiable, if prevented early, could help to reduce the symptoms of urinary incontinence.

Keywords: Prevalence; Sri Lanka; Urinary incontinence.

INTRODUCTION

Urinary incontinence (UI) is defined as the involuntary loss of urine, which is a social or hygienic problem and is objectively demonstrable[1]. UI could be stress urinary incontinence (SUI), urge urinary incontinence (UUI) or mixed urinary incontinence (MUI). It is difficult to make the correct distinction between these three types of UI based on just questionnaires alone and urodynamic tests are often considered gold standard[2]. UI affects people of all ages. The exact prevalence of UI is uncertain but it varies from 10 to 60% in Europe and limited data are available for women in Asian countries [3,4,5]. These variations are due to lack of standardization of definitions, age of target population, and variable study designs[6,7]. The prevalence of UI increases with age, with 20.0–30.0% prevalence in young adults, a peak around middle age (prevalence 30.0–40.0%) and a steady increase in old age (prevalence 30.0–50.0%) [8]. Women are much more susceptible to UI than men. Reproductive and hormonal changes associated with pregnancy and menopause explains the differences prevailing between male and female[9,10,11]. It is highly probable that socio-economic and cultural factors play a crucial role in UI. However the extent of the influence of these factors on women's health remains relatively unknown. In Sri Lanka, inadequate epidemiological data on the prevalence of female UI led us to conduct this study. The aims of this community-based cross-sectional study were to investigate the prevalence and associated risk factors of UI in women in three districts of Sri Lanka and also to increase the awareness of both health care providers and the community about this health issue.
In addition, one of our aims was to refer women with incommodious symptoms to specialized health care centers for further management.

MATERIALS AND METHODS

This study was a community based cross-sectional study conducted in the years 2015 - 2016. Out of the 24 districts in Sri Lanka, three districts; Colombo, Ratnapura and Trincomalee, were randomly selected for this study as the women in these three districts would represent the Sri Lankan female population. The initial hypothesis was that through this population we could access a very large part of the female population of our country. We believe that the distinctive characteristics of these three districts allow us to a very considerable extent, to extrapolate the results of our sample to the majority of the general female population. The inclusion criteria was women in the age group of 18 and above, living in one of the above three districts for more than three years. Women with any surgeries that were related to

[1]Department of Obstetrics and Gynecology, Faculty of Medical Sciences, University of Sri Jayewardenepura.

[2]Department of Community Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura.

*Correspondence: Department of Community Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura.
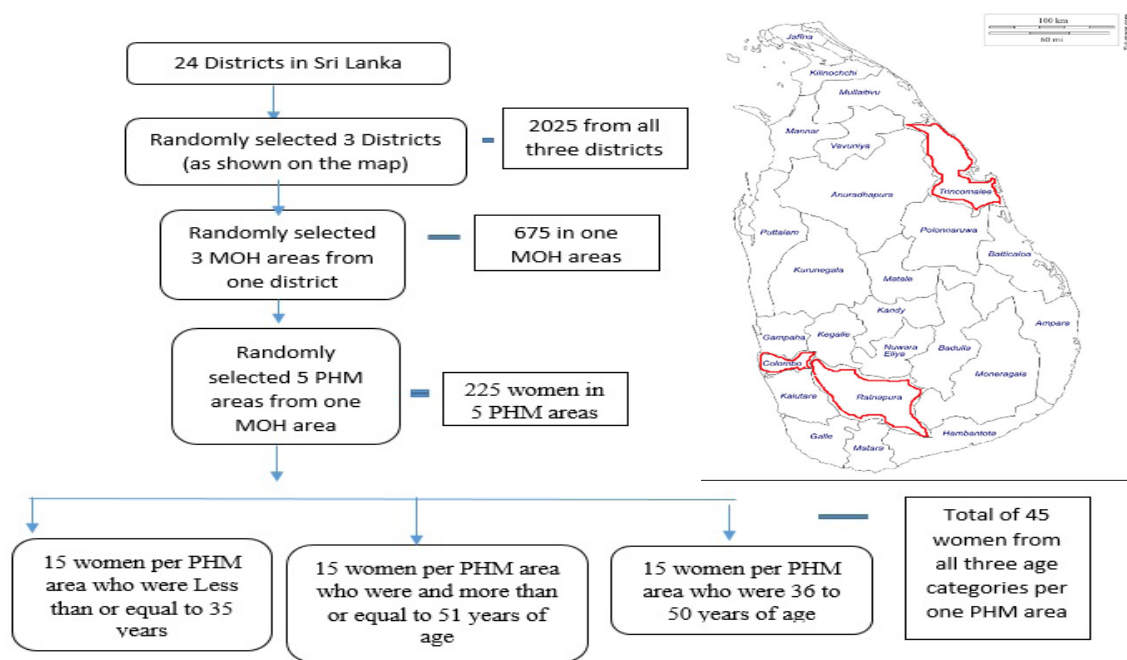E-mail: shamini@sjp.ac.lk.

Figure 1. Flow chart for sampling technique.

defining the severity of UI. UI occurrence was considered mild if it occurred once or twice a week, moderate if it was once or twice a day and severe if it was 3 or more times a day. Women who had UI less than once a week or a month or who did not have any complaints were considered continent. Medical conditions were considered to be present if there was a diagnosis made by a Consultant Physician or a Consultant Endocrinologist and only if the patient had a diagnosis card.

An interviewer-administered questionnaire (IAQ) was used as the data collection instrument. This IAQ consists of two parts; Socio demographic factors, Medical and Obstetric History, and the King's Health Questionnaire (KHQ), which consists of UI symptoms for the prevalence study. The KHQ is a validated questionnaire with high reliability[12] and has been translated into two languages Sinhala and Tamil. To ensure that the questionnaire was easily understandable, a few months before the onset of the study, pre testing was done in a small group of women (n=50) in Borelesgamuwa MOH area. After reviewing these preliminary results, some questions were revised resulting in an improved, final version. The KHQ's good reliability was evidenced by Cronbach's alpha coefficients of > 0.60, indicating reasonable consistency in all domains.

Informed written consent was obtained from study participants prior to conducting the study. All subjects were told that participation in the investigation was strictly voluntary and that data collected would not be used for anything except the aims of the research. The public health midwives were trained to collect data and all subjects were told that participation in the investigation was strictly voluntary. The questionnaire was administered in a setting that provided privacy during the interview and the time taken to complete the questionnaire was between 15 and 20 minutes per subject. Only the investigators handled the data and the confidentiality was maintained. All women who were identified to have more than moderate UI were referred to the respective /nearest tertiary hospitals.

The research was conducted with the permission of Deputy Provincial Director of Health Services of the three districts and from the relevant MOH's of the districts.

Chi Square test and odds ratios were used to describe the risks and associated factors. Test of proportions and the prevalence were calculated for each district and for the three age groups. Those risk factors with a p value less than 0.05 in bivariate analysis were selected to enter into the multivariate model and the final model was constructed by backward stepwise method with the significance level set at 5%. Analysis was performed with SPSS version 15. Ethical clearance was obtained
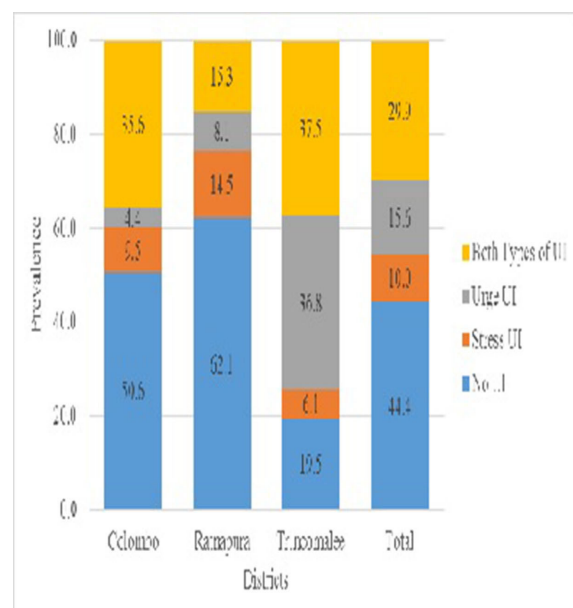

Figure 2. Prevalence of UI in the three districts of Sri Lanka.

Table 1. The socio demographic and medical characteristics of the women studied.

Variable	n	%
Age Group (years)		
< 35	787	33.4
36 – 50	781	33.2
> 51 780		33.1
Total	2448*	
Education level		
No schooling	110	4.7
Primary education	396	16.8
Studied up to grade 10	990	42.1
Studied up to Advanced level	798	33.9
Post Graduate education	46	2.0
Total	2340*	
Religion		
Buddhist	1557	65.6
Others	793	34.3
Total	2350*	
Employment status		
Housewives	2270	83.1
Workers	84	13.0
Total	2354	
Marital status		
Married/ Living together	2174	92.4
Single/ Unmarried/ Divorced	159	6.7
Total 2333*		
Number of births		
No births	74	3.1
1	615	26.1
2	795	33.8
≥ 3	774	32.9
Total	2258*	
Co morbidities		
Diabetes Mellitus	179	7.6
Bronchial Asthma/Respiratory Diseases	102	4.3
Continence status		
Continent	1046	44.4
Incontinent	1308	55.6
Stress incontinence only	235	10.0
Urge Incontinence only	368	15.6
Both Stress and Urge Incontinence	705	29.9

from the Ethical Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura.

RESULTS

The total of 2354 participated in the study 896 (38.1%) from Colombo, 725 (30.8%) from Rathnapura and 733 (31.1%) from Trincomalee.

The mean age of the women was 43.8 + 14.3 years (range 18 – 90 years). Most women (92.4%) were married and 66.7% reported two or more children. Nearly 78% had completed secondary education, but with only 13% being employed. Majority in the study were Sinhala Buddhist (65.6%); the remaining participants, primarily estate workers, were Tamil Hindus. Nearly 12% had co-morbidities such as Diabetes and respiratory disease.

Among all women, 44.4% had no symptoms of UI, whereas 10% had symptoms of only stress incontinence, 15.6% had symptoms of only urge incontinence and 29.9% had symptoms of both stress and urge incontinence.

Our results indicated that 1308 women (55.5 %) had suffered from symptoms of UI within the last 3 months. There was a statistically significant difference in the prevalence of UI in all three districts ($p < 0.001$). Compared to other two districts, Ratnapura district had a higher prevalence of SI (14.5%) and Trincomalee district had a higher prevalence of UI (36.8%). (**Figure 2**) It was observed that the prevalence of UI increased with age, being especially apparent in the age groups of 36–50 years and 51 years and over ($p = 0.001$).

In comparison of the severity of incontinence, for both SUI and UUI, there was a statistically significant association in the trend analysis between the age groups from young to old. Incontinence was mostly observed in females who were 51 years and above.

Table 4 shows stepwise logistic regression analysis, formed with possible risk factors. Those in the age group 36 – 50 years and 51 years and above had two times the risk of UI than those in the 18 – 35 age group. Compared to employed women, unemployed women had a higher risk of UI. Those with Respiratory problems and with Diabetes were also found to have higher risk of UI.

Those living in the Trincomalee District were found to have higher risk of UI when compared to those living in Colombo District (OR = 4.58; 95% CI = 3.35 – 6.27).

According to the results, no significant association was revealed between the frequency of UI and the women's marital status and educational status.

DISCUSSION

UI is usually a hidden problem, either because the patient considers the problem as normal or they feel embarrassed to seek health care.

Significant UI can be simply defined as bothersome urinary leakage and it is important to find out the mean number of woman with significant UI rather than the crude prevalence rate to optimize the health care resources[6]. In the literature worldwide, there is great diversity in the prevalence of UI reported among women, which is between 16.3 and 54.8%[2,6,13]. In studies carried out in Sri Lanka, prevalence of 9.8% was reported by some researchers[14] and much higher prevalence rate of 23.3% was reported by others[15]. We used a validated questionnaire rather than the questions prepared

Table 2. Distribution of the different types of UI in different age groups

	No UI	Stress UI	Urge UI	Stress and Urge UI
Age groups in years				
18-35 years	481 (46.1)	65 (27.8)	102 (27.7)	139 (19.8)
36 – 50 years	296 (28.4)	70 (29.9)	130 (35.3)	285 (40.6)
51 years and above	267 (25.6)	99 (42.3)	136 (37.0)	278 (39.6)

on the basis of the literature, used by some researches and our prevalence rate is 55.5%. This is much higher than the similar studies carried out using validated questionnaire, which was reported to be around 29% 16. The reasons for this high discrepancy may include variations in definitions of the frequency and nature of incontinence, sampling methodologies, response rates and question formats[13].

There are many conflicting results in the literature, regarding the type of UI reported. We haven't used any urodynamic investigations and diagnosis is based mainly on symptoms. Some suggested MUI as the commonest type[17] in agreement with the present study. In all three districts MUI is the commonest (29.9%), followed by UUI (15.6%) and SI (10%). UUI was more common in women in Trincomalee district, where as SI was commoner in Colombo and Rathnapura district. Only 30 % of Women in Rathnapura district reported symptoms of UUI, which is much lower than the other two districts. The differences in the findings in the prevalence of different types of UI in three districts could be due to the standardization problems in the definition of UI and the differences in the ethnical and socio demographic characteristics of societies which also have been reported in previous researchers[18].

The severity of incontinence in cases of SUI and UUI was mild in both situations (65.2% and 63.6% respectivley). A similar finding was reported in South Wales, where 64% of women surveyed complained of only slight incontinence[19]. A limitation in the study was that we assessed, how the patients perceive their problem and the severity was not objectively measured. However, as the severity of the disease is very important in decision making pertaining to treatment, and as severity

affects quality of life, perceived severity of the problem could be equalized to the true status of the problem.

In accordance with some other studies 20, as the education level of women decreased, the prevalence of UI increased and this could be due to the fact that women with lower education levels accept UI symptoms as normal rather than a disease process and also perceive it as shameful and avoid presenting to health centers. In consistent with previous studies [21,22,23,24], a significant association of UI with increase age, being pregnant, childbirth and increased parity was found in our study. Similar to other studies[25], perineal trauma following vaginal delivery was significantly associated with UI. There was a significantly risk of incontinence among women with co morbidities such as diabetes and respiratory problems in agreement with some studies20. This may be due to increased urine volume and detrusor over activity associated with diabetes and increased abdominal pressure when coughing associated with respiratory diseases.

Interestingly, treatment-seeking behavior has been reported to be very poor[15] and only about 12%. We did not include investigation on the reasons in the current study.

None of the patients were examined Gynaecologically and the presence of UI was determined by verbal inquiry alone and this can reduce the precision of arriving at a diagnosis of UI.

The prevalence of UI found in the women we studied was relatively high, with women displaying increasing severity and prevalence with increasing age. Despite the bias of this study based purely on the household female population, the sample can be considered representative of the country's female population since the

Table 3. Severity of Incontinence among different age groups

	Age groups in years			
	18-35 years (%)	36 – 50 years (%)	51 years and above (%)	*p* value
Stress Incontinence				
No Incontinence	583 (41.3)	426 (30.2)	403 (28.5)	
Mild	145 (23.7)	247 (40.4)	220 (35.9)	.001
To a certain extent	35 (19.8)	59 (33.3)	83 (46.9)	
Frequently	24 (16.3)	49 (33.3)	74 (50.3)	
Urge Incontinence				
No Incontinence	546 (42.7)	366 (28.6)	366 (28.6)	
Mild	186 (27.3)	277 (40.7)	218 (32.0)	.001
To a certain extent	37 (14.1)	91 (34.6)	135 (51.3)	
Frequently	18 (14.3)	47 (37.3)	61 (48.4)	

Table 4. Significant independent variables for UI by Regression analysis

Variable	No UI	UI	OR	95% CI
Age Group (years)				
18-35 years	481 (61.1)	306 (38.9)	-	
36 – 50 years	296 (37.9)	485 (62.1)	2.03	1.56 - 2.63
51 years and above	267 (34.2)	513 (65.8)	2.61	1.95 – 3.48
District				
Colombo	453 (50.6)	443 (49.4)	-	
Ratnapura	450 (62.1)	275 (37.9)	0.61	0.48 – 0.77
Trincomalee	143 (19.5)	590 (80.5)	4.58	3.35 – 6.27
Number of children (mean ± SD)	2.19 (1.11)	2.63 (1.53)	1.11	1.02 – 1.21
Mode of Delivery				
Normal Vaginal Delivery	627 (43.8)	806 (56.2)	-	
Cesarean section	233 (59.6)	158 (40.4)	0.61	0.46 – 0.79
Occupation				
Occupied	158 (51.8)	147 (48.2)	-	
Presently Not Occupied	848 (43.4)	1108 (56.6)	1.75	1.28 – 2.39
Diseases				
No diseases	949 (45.8)	1124 (54.2)	-	
Respiratory Problems	40 (39.2)	62 (60.8)	2.17	1.48 - 3.19
Diabetes Mellitus	57 (31.8)	122 (68.2)	1.97	1.19 - 3.23

data are comprehensive in terms of the current census. Although the prevalence and severity of UI was higher in older age groups, a significant proportion of women belonging to the younger age groups experienced UI as well. As UI was significantly associated with pregnancy and parity, lack of optimum perinatal and post-natal care may have contributed to the high prevalence rates in this age group.

As many of the affected women were not aware of the preventive measures and available treatment options, it is important to provide education on lower urinary tract health both to the general public and healthcare providers.

In Sri Lankan community, women have very close relationship with members of the primary health care team specially, with the Public Health Midwife (PHM) for maternal care, childcare and family planning. Therefore, it would be beneficial to train PHM on raising awareness of UI among women and also they should be taught how to make basic continence assessments and informed the women that the occurrence of UI is not a normal part of aging and the availability of effective treatment options.

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