Risk Factors and Types of Urinary Incontinence among Middle-Aged and Older Male and Female Primary Care Patients in Kaunas Region of Lithuania: Cross Sectional Study

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Purpose: The aims of the study were to evaluate the incidences, types of urinary incontinence (UI) and its risk factors among middle-aged and older (> 40 years) men and women visiting a general practitioner (GP).

Materials and Methods. This is a descriptive and cross-sectional comparative study using a questionnaire-based survey included 172 male and female patients who consecutively visited a primary care center in Kaunas region of Lithuania.

Results: All 86 women (100%) and 65 men (75.58%) had symptoms of UI ($P < .001$). About 55% of women were classified as having stress urinary incontinence (SUI) and 60% of men urge urinary incontinence (UUI) ($P < .001$). The risk factors for women with SUI were: age below 60 years (odds ratio [OR] = 2.89, 95% confidence interval [CI]: 1.89-4.43; $P < .001$), being married (OR = 6.31, 95% CI: 2.35-16.97; $P < .001$), sedentary-standing job (OR = 1.492, 95% CI: 1.01-2.20; $P = 0.041$), arterial hypertension (OR = 2.03, 95% CI: 1.39-2.96; $P < .001$), diabetes mellitus (OR = 3.01, 95% CI: 1.02-8.86; $P = .032$), menopause (OR = 1.48, 95% CI: 1.20-1.83; $P < .001$) and features of past pregnancies. The UUI was associated with age over 60 years (OR in men = 2.93, 95% CI: 1.15-7.51; $P = .022$, in women OR = 8.76, 95% CI: 2.37-32.33; $P < .001$. Low health-related quality of life was the most prevalent among men with UUI (50.8%) and among women with SUI (23.3%) ($P = .023$).

Conclusion: UI was common among patients aged > 40 years visiting GP and affected more women of the same age range. SUI was more prevalent among women, while more men had UUI. Age below 60, being married, pregnancy and delivery history, concomitant illnesses were significant risk factors for women' SUI and older age and menopause for UUI. The only risk factor for men' UUI was age over 60 years.

Keywords: prevalence; risk factors; urinary incontinence; epidemiology; etiology; female; male.

INTRODUCTION

Urinary incontinence (UI) is an involuntary loss of urine which is objectively demonstrable and resulting in psychosocial or hygienic impairment.[1,2] UI affects 20%-30% of people worldwide; 20%–50% of women and 11-34 % of men are affected over the course of their lives.[3] It is four times more common in women under 60 years than in men of the same age range.[4] The most common form of UI in women is stress urinary incontinence (SUI), an involuntary loss of urine during physical activity (49%); followed by urge urinary incontinence (UUI) or overactive bladder (21%), characterized by involuntary detrusor contractions during the filling phase, which may be spontaneous or provoked (and patient cannot completely suppress); and mixed urinary incontinence (MUI) (29%), the complex of symptoms of SUI and UUI.[1,5] UUI is the prominent type of incontinence in men (40%-80%), followed by MUI (10%-30%) and SUI (less than 10%).[1]

Incidence of UI increases with age and it is more prevalent in an aging population. The aging changes in the bladder and pelvic structures could contribute to UI among women.[6] Prevalence of men UI even more steadily increases with increasing age: due to bladder outlet obstruction which may cause detrusor instability.[7] But the presence of UI is not restricted by an elderly age group. UI in women is often assumed to be attributable to the effects of pregnancy and childbirth, vaginal delivery and parity. The atrophic changes in the urogenital tract during menopause increases susceptibility to urinary tract infections and could cause storage symptoms of UI.[1] Obesity, chronic diseases and use of

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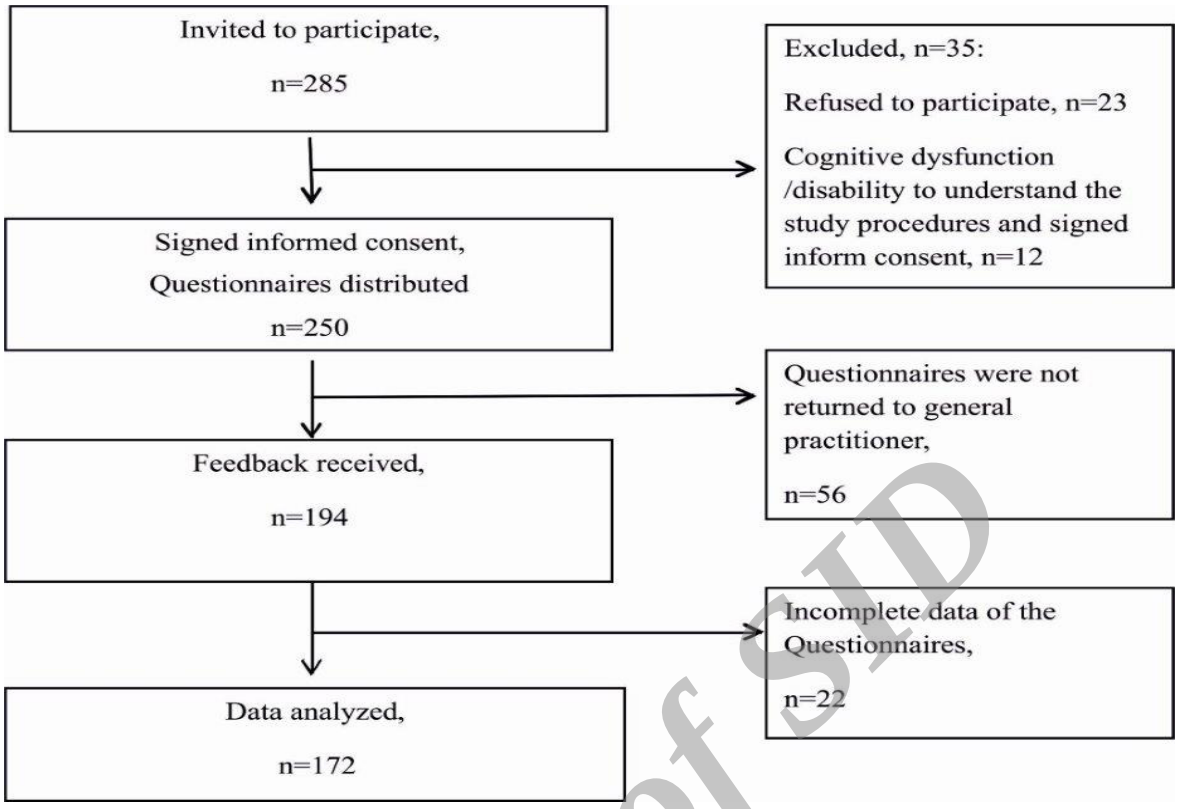

medications have also been reported to be associated with UI.[8] A very important issue is the quality of life, because moisture-associated skin damage is cumbersome for a person with UI, especially at an older age.[1] These problems tend to limit patient's social life and mental health, resulting in loneliness, lowered self-esteem, anxiety, and depression that can impair the quality of one's professional and sexual life.[9-11]

Data concerning costs and treatment as well as registry of UI subjects is absents in Lithuania, therefore the aid to people with UI is inconsequent. No sufficient attention is paid to preventive measures for people at risk of UI; no screening that would enable early diagnosis of UI, and no data about incontinence-related quality of life. The general practitioner (GP) or other physicians usually do not ask and patients do not report UI because of embarrassment or feeling that this disorder is an inevitable part of aging. Therefore, these patients do not receive appropriate treatment.

The aims of this study were to evaluate the incidence and types of UI, their risk factors and impact on health-related quality of life (HRQoL) among middle-aged and older (> 40 years) men and women visiting GP.

MATERIALS AND METHODS

Study Subjects

The study and its consent procedure were approved by Kaunas Regional Bioethics Committee (approval No.BEC-MF-550), Lithuania. The research was carried out at three primary health care centers in Kaunas region, Lithuania: in 1 rural and 2 urban areas during a one year period starting at July 2013. This study was carried out as a descriptive and cross-sectional comparative study using a questionnaire-based survey. Inclusion criteria for the study were: [1] middle-aged and older (> 40 years) men and women who consecutively visited the general practitioner and [2] giving informed consent. Exclusion criteria consisted of cognitive dysfunction or disability to understand the study procedures and sign the inform consent. Two hundred and eighty five patients were invited to participate in the study. The flowchart of study participants is presented in **Figure**. Data of 172 surveys (60.4%) was included into final analysis.

Questionnaires

The tool of measurement in the study was a questionnaire developed according to previously validated questionnaires.[12-14] The first part of the questionnaire includes demographic characteristics such as age, gender, educational level, marital status, weight, height, character of job and medical history (9 questions).

The second part of the questionnaire for women comprises questions about pregnancy and obstetric history, including last menstruation date, number of pregnan-

Table 1. Socio-demographic characteristics of the study population (n = 172).

Characteristics	Men (n = 86)		Women (n = 89)		*P* Value
Age, mean ± SD, years	64.8 ± 13.52		63.5 ± 11.74		.552
Age group, years	no.	%	no.	%	.133
< 50	18	20.9	12	14.0	
50-59	13	15.1	23	26.7	
60-69	17	19.8	24	27.9	
70-79	26	30.2	19	22.1	
≥ 80	12	14.0	8	9.3	
Height, mean ± SD, m	1.8 ± 0.06		1.7 ± 0.04		< .001
Weight, mean ± SD, kg	85.6 ± 14.85		78.1 ± 10.67		< .001
BMI, mean ± SD, kg/m^2	26.3 ± 4.25		27.9 ± 3.93		.012
BMI groups, kg/m^2					.016
< 25	32	37.2	21	24.4	
25-29.9	42	48.8	38	44.2	
≥ 30	12	14.0	27	31.4	
Education					.136
Incomplete secondary school	8	9.3	6	7.0	
Secondary school	31	36.1	32	37.2	
Higher education (College)	10	11.6	22	25.6	
Higher education (University)	37	43.0	26	30.2	
Marital status					.248
Single/divorced/widowed	23	26.8	30	34.9	
Married	63	73.3	56	65.1	
Job					< .001
Sedentary	20	23.3	19	22.1	
Sedentary and standing	22	25.6	20	23.3	
Moving	17	19.8	15	17.4	
Hard physical	27	31.4	15	17.4	
Housekeeper	0	0.0	17	19.8	
HRQoL					< .001
Low	68	79.1	40	46.5	
High	18	20.9	46	53.5	

Abbreviations: BMI, Body Mass Index; HRQoL, Health Related Quality of Life; SD, standard deviation.

cies, vaginal/Caesarean deliveries, episiotomy, the birth weight of newborns, previous gynecological and abdominal surgery (8 questions). The questionnaire for men includes an assessment of the International Prostate Symptom Score (IPSS), an instrument to grade urinary symptom severity, which is based on the answers of the 7 questions. Points from 0 to 5 assigned to each answer indicate increasing severity of the particular symptom. Total score ranges from 0 to 35.

Third part included an assessment for UI using Overactive Bladder questionnaire (OAB-q). The OAB-q is a validated condition-specific instrument that contains an 8-item Symptom Bother scale and a 25-item HRQoL scale. Scores on each scale are normalized on a scale of 0–100. Higher scores on the Symptom Bother Scale reflect greater bother, and higher scores on the HRQoL scale and domains reflect a greater impact of UI on HRQoL.

The fourth part includes the Hospital Anxiety and Depression Scale (HADS). The scale consists of 14 items comprising HADS-A (anxiety, 7 questions) and HADS-D (depression, 7 questions) subscales. All items

Table 2. Socio-demographic and clinical characteristics of the study population with symptoms of urine incontinence (n = 151).

Disorders Characteristics	Men		Women		*P* Value
Participants, no. %	65	75.58	86	100.0	< .001
Age, mean ± SD, years	70.62 ± 9.46		63.52 ± 11.74		< .001
Age group, years	no.	%	no.	%	.03
<50	1	1.5	12	14.0	
50-59	9	13.8	23	26.7	
60-69	17	26.2	24	27.9	
70-79	26	40.0	19	22.1	
>80	12	18.5	8	9.3	
BMI, mean ± SD, kg/m^2	26.9 ± 4.43		27.9 ± 3.93		.152
BMI groups	no.	%	no.	%	.076
< 25	19	29.2	21	24.4	
25-29.9	36	55.4	38	44.2	
≥ 30	10	15.4	27	31.4	
Job	no.	%	no.	%	.001
Sedentary	12	18.5	19	22.1	
Sedentary and standing	15	23.1	20	23.3	
Moving	15	23.1	15	17.4	
Hard physical	23	35.4	15	17.4	
Housekeeper	0	0.0	17	19.8	
Types of UI	no.	%	no.	%	< .001
Stress UI	6	9.2	47	54.7	
Urge UI	39	60.0	26	30.2	
Mixed UI	20	30.8	13	15.1	
Signs of UI	no.	%	no.	%	
Frequent urination during the daytime hours	62	95.4	45	52.3	< .001
Incontinence while sleeping	59	90.8	43	50.0	< .001
Waking up at night because had to urinate	56	86.2	43	50.0	< .001
An uncomfortable urge to urinate	64	98.5	33	38.4	< .001
Sudden urge to urinate with little or no warning	60	92.3	39	45.4	< .001
Accidental loss of small amounts of urine	43	66.2	41	47.7	.024
An uncontrollable urge to urinate	57	87.7	39	45.4	< .001
Urine loss associated with a strong desire to urinate	49	75.4	73	84.9	.142
Incontinence while coughing or sneezing	24	36.9	60	69.8	< .001
Concomitant diseases					
Hypertension	49	75.4	51	59.3	.039
Diabetes	19	29.2	14	16.3	.057
Depressive disorder	8	12.3	8	9.3	.552
Erection dysfunction (men)	43	66.2	-	-	.542†
Prostate cancer (men)	18	27.7	-	-	< .001†
HRQoL					.001
Low	48	73.8	40	46.5	
High	17	26.2	46	53.5	

Abbreviations: BMI, Body mass Index; UI, urinary incontinence; HRQoL, Health Related Quality of Life.

†The Z-test for 2 population proportion was made.

Table 3. The analysis of association between socio-demographic and clinical characteristics as risk factors and types of urine incontinence in study population (men n = 86, women n = 86).

Characteristics	Stress Urine Incontinence		Urge Urine Incontinence		Mixed Urinary Incontinence	
	Men (n = 6)	Women (n = 47)	Men (n = 39)	Women (n = 26)	Men (n = 20)	Women (n = 13)
	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI
	P Value	*P* Value	*P* Value	*P* Value	*P* Value	*P* Value
Age groups						
< 60 years	NS	2.89 [1.89-4.43]	NS	NS	NS	NS
		< .001				
> 60 years	NS	NS	2.93 [1.15-7.51]	8.76 [2.37-32.33]	0.53 [0.42-0.67]	0.52 [0.42-0.65]
			.022	.001	< .001	.001
Married						
Yes	NS	6.31 [2.35-16.97]	NS	NS	NS	NS
		< .001				
No	NS		NS	0.11 [0.04-0.32]	NS	NS
				< .001		
Sedentary- standing job type	NS	1.492 [1.01-2.20]	NS	NS	NS	NS
		.041				
Hypertension	NS	2.03 [1.39-2.96]	NS	5.88 [1.81-19.13]	NS	NS
		< .001		0.002		
Diabetes	NS	3.01 [1.02-8.86]	NS	NS	NS	NS
	.032					
Erection disorders†	NS	_____	NS	_____	5.10 [1.54-16.92]	_____
					.005	
Prostate cancer†	NS	_____	NS	_____	63 [13.53-293.32]	_____
					< .001	
Menopause‡	_____	1.48 [1.20-1.83]	_____	9.09 [1.14-72.7]	_____	NS
		< .001		.015		
Vaginal childbirth method‡	_____	18.08 [2.90-130.83]	____	NS	_____	NS
		< .001				
_Two and more childbirth‡	_____	5.76 [1.48-22.49]	____	NS	_____	NS
		.006				
_Weight of fetus > 3 kg‡	_____	0.77 [0.65-0.91]	_____	NS	_____	NS
	.001					
Rupture of perineum‡	_____	3.13 [1.13-8.69]	_____	NS	_____	NS
		.026				

†men; ‡ women.

are rated on a four-point scale, scored from 0 to 3, resulting in maximum subscale scores of 21 and an overall total score ranging from 0 to 42 with higher scores showing a greater self-reported severity of depression/anxiety.

Statistical Analysis

Table 4. The analysis of association between Health Related Quality of life and prevalence of types of urinary incontinence.

Gender	HRQoL	Stress Urine Incontinence	Urge Urine Incontinence	Mixed Urinary Incontinence	Total	*P* Value
Men, no. (%)	Low	6 (9.2)	33 (50.8)	9 (13.8)	48 (73.8)	.001
	High	0 (0)	6 (9.2)	11 (16.9)	17 (26.2)	
Women, no. (%)	Low	27 (31.4)	11 (12.8)	2 (2.3)	40 (46.5)	.023
	High	20 (23.3)	15 (17.4)	11 (12.8)	46 (53.5)	

Abbreviation: HRQoL, Health Related Quality of Life.

The statistical analysis was performed using Statistical Package for the Social Science (SPSS Inc, Chicago, Illinois, USA) version 21. For descriptive statistics, scale variables were described using mean and standard deviation (SD). Categorical variables were described by distribution, in numbers (and percent. Kolmogorov-Smirnov test was used to assess normality of the data and $P < .05$ was considered to indicate a non-Gaussian distribution. Values of men' age (n = 86) showed a non-Gaussian distribution ($P = .012$), values of women' age (n = 86) showed normal distribution ($P = .2$). In the later statistical analysis non-parametric tests were used. The frequency rates and relationship between UI and its risk factors were conducted using the Pearson chi-square test, the Fisher's exact chi-square test, and the Continuity Correction test. Significantly related variables were assessed using the Spearman's correlation and model of logistic regression. Statistical significance was set at the 5% level ($P < .05$).

The sample size calculation was made according the assumption about 30% estimated prevalence of UI, based on the average prevalence in the studies.[1] The absolute precision was set at 7% (above and below the 30%) with a 95% CI level. Accordingly, the estimated sample size was 164 subjects.

RESULTS

Women aged from 41 to 88 years and men aged from 42 to 88 years participated in the study. There was no significant difference between men and women regarding mean age and prevalence of UI in age groups. The sociodemographic characteristics of study subjects by gender are given in **Table 1**. Calculation of BMI revealed that 48.8% of men and 44.2% of women were overweight, 14% of men and 31% of women were obese ($P = .016$). The significant differences in height, weight and BMI were observed between genders: mean height and weight were significantly higher in men group ($P \leq .001$), but mean BMI was higher in women group ($P = .012$). A comparison of the patients' education and marital status did not reveal significant differences between genders. Job type differed significantly between genders ($P < .001$): contrary to men who all had paid jobs, one-fifth of women (19.8%) were housewives; one-third of men (31.4%) had a physically demanding job. Significantly more men (79.1%) evaluated their HRQoL as low in comparison to women (46.5%, $P < .001$). There were no differences in HAD-A and HAD-D subscales results among genders.

The data of questionnaires revealed that all women enrolled in the study (n = 86, 100%) and 65 men (75.58%) had symptoms of the UI, with significantly higher prevalence of UI among women ($P < .001$). **Table 2** summarizes the sociodemographic and clinical characteristics of 151 participants with UI by gender. Men with UI were older than women (70.62 ± 9.46 vs. 63.52 ± 11.74, respectively, $P < .001$). More than 62% of men with UI were in age range 60-79 years, and more than 54% of women with UI in age range 50-69 years ($P = .03$). Participants who related UI to physical activity, sneezing, or coughing were classified as having SUI; those who experienced urine loss immediately following a sense of urgency were classified as having UUI; those who reported urinary leakage under both situations were classified as having MUI. The types of UI significantly differ by gender ($P < .001$): 60% of men (n = 39) were classified as having pure UUI, 55% of women (n = 47) as having pure SUI. Only two incontinence signs, such as loss of small amounts of urine associated with a strong desire to urinate and incontinence while coughing or sneezing were more prevalent in women, but only incontinence while coughing or sneezing was determined as significant ($P < .001$). All other signs presented in **Table 2** were significantly more common among men.

The prevalence of hypertension as a risk factor was more prevalent among men with UI ($P = .039$), but no gender differences in incidence of diabetes or depressive disorder among subjects with UI were observed. The *Z*-test was made to compare proportions of men with erection disorders and prostate cancer. Percentage of men with UI and erection dysfunction did not significantly differ from men with UI without erection dysfunction. The prostate cancer was found in a smaller

part of men with UI ($P < .001$), but all 18 patients with prostate cancer had symptoms of UI (without differences among surgically treated vs. not treated). In the whole study sample, significantly more men with UI evaluated their HRQoL as low, in comparison to women with UI (73.8% vs. 46.5%, $P = .001$). Self-reported severity of depression and anxiety did not differ between men and women with UI.

We sought to discover the association between the patients age and symptom severity of UI. The older male patients reported more severe urinary symptoms on the IPSS scale (r = .577; $P < .001$). Both gender patients age positively correlated with the bother severity on Symptom Bother Scale: male (r = 0.454; $P < .001$); and female (r = 0.655; $P < .001$) patients. Positive associations between older age and lower HRQoL was determined only for male (r = 0.623; $P < .001$), but not for female patients with UI. There was no correlation between severity of UI, BMI and mental symptoms. The analysis of association between sociodemographic and clinical characteristics as risk factors for all three types of UI in both genders is shown in **Table 3**. No relations between SUI for men and any of sociodemographic/clinical factors were found. The risk factors proved to increase the odds for women SUI were: age below 60 (OR = 2.89, 95% CI: 1.89-4.43; $P < .001$), being married (OR = 6.31, 95% CI: 2.35-16.97; $P < .001$), sedentary-standing type of job (OR = 1.492, 95% CI: 1.01-2.20; $P = .041$), arterial hypertension (OR = 2.03, 95% CI: 1.39-2.96; $P < .001$), diabetes mellitus (OR = 3.01, 95% CI: 1.02-8.86; $P = .032$). The study revealed that gynecological factors, such as menopause (OR = 1.48, 95% CI: 1.20-1.83; $P < .001$), vaginal childbirth (OR = 18.08, 95% CI: 2.90-130.83; $P < .001$), two or more childbirths (OR = 5.76, 95% CI: 1.48-22.49; $P = .006$), weight of fetus over 3 kg (OR = 0.77, 95% CI: 0.65-0.91; $P = .001$) and perineum rupture (OR = 3.13, 95% CI: 1.13-8.69; $P = .026$) were risk factors for women SUI.

The UUI in both genders was associated with age over 60: in men it increased the OR for the UUI 2.93, 95% CI: 1.15-7.51; $P = .022$, in women, OR = 8.76, 95% CI: 2.37-32.33; $P < .001$. Single marital state for women (OR = 0.11, 95% CI: 0.04-0.32; $P < .001$), arterial hypertension (OR = 5.88, 95% CI: 1.81-19.13; $P = .002$) and menopause (OR = 9.09, 95% CI: 1.14-72.7; $P = .015$) were determined as risk factors for women UUI. The age over 60 was determined as a risk factor for MUI in men (OR = 0.53, 95% CI: 0.42-0.67; $P < .001$) and in women (OR = 0.52, 0.42-0.65; $P = .001$). Prostate cancer (OR = 63, 95% CI: 13.53-293.32; $P < .001$) and erection disorders (OR = 5.10, 95% CI: 1.54-16.92; $P = .005$) showed significant associations with MUI in the male group. BMI, depressive disorder, episiotomy for women, pelvic organs surgery and other variables were not detected as risk factors for different types of UI.

As shown in Table 4, HRQoL significantly differed between the types of UI in men ($P = .001$) and women ($P = .023$). Low HRQoL was most prevalent in men with UUI (50.8%) and in women with SUI (23.3%).

DISCUSSION

Worldwide literature presents that aging increases the risk of developing UI. Our study revealed that all middle-aged and older women (> 40 years) and three-fourth of men of the same age consecutively visiting their GP had the symptoms of UI. We have determined that UI is more prevalent and occurs at a younger age in women: approximately one-third of women with UI were between 60 and 69 years while in men, from 70 to 79 years. Gender differences in our study were also found in the distribution of UI types, more than a half of women had SUI, followed by one quarter having UUI; two third of men had pure UUI and one-fifth MUI. These results are in accordance with other researchers, who determined a dominance of UUI type in men and SUI type in women.[1]

SUI, most prevalent type of UI among women in our study mostly related with pregnancy and delivery risk factors, two and more childbirth, vaginal childbirth method, rupture of perineum; it could be the explanation to why SUI occurs at a younger age. Similar findings about younger women with symptoms of SUI were in Ueda and colleagues' study. They revealed that women with SUI were mostly in the age group of 50 to 60 or over the age of 40.[15] Rortveit and colleagues showed that childbearing was associated with increased risk of both SUI and MUI as well.[16] SUI was associated with the type of delivery. It was more frequent after vaginal delivery than after Caesarean section; but the risk of SUI was higher among women who had Caesarean sections than among nulliparous women.[17] Birth giving the first child at an age less than 20 years, vaginal delivery of a large baby with an episiotomy and more than 3 pregnancies are SUI risk factors.[18]

According to our data, the state of being married was associated with SUI. Sexual activity of marital women associated with SUI, even 92% sexually active women reported SUI symptoms.[19] Sedentary-standing job was detected as a risk factor for women SUI. According the Nygaard and colleagues' study, about 30% of women reported urinary leakage during a physical job.[20]

In our study 16% of women with symptoms of UI had diabetes mellitus and this concomitant illness was determined as a risk factor for women's SUI. It is known that diabetes can disrupt the mechanism of continence: women with diabetes were more likely to experience severe UI.[21] Each one unit increase in glycosylated hemoglobin (HbA1c) was associated with 34% increase in women SUI.[22] Our data revealed that hypertension was more prevalent in men than in women with UI, however hypertension was determined as the significant risk factor for SUI and UUI in women. In the Brazil population-based study among women 50 years and over total prevalence of UI was 52.3%. Hypertension was one of factors significantly associated with higher prevalence of UI.[23] The hypertension group had a significantly higher risk of UI than the group without hypertension.[24]

The results of our study revealed that older age and menopause status mostly associated with second most prevalent type of UI among women, UUI. Menopause, as a risk factor, increased the risk of having UUI symptoms more than 8 times. This corresponds to the results of a Norwegian study, a higher prevalence of UUI in women of age 45-55 coincides with the menopause transition.[5] It could be explained that estrogens loss contributes to the problem of UI.[1] Our findings about the unmarried status as risk factor for UUI in women associated with the findings, that UUI was the most prevalent among single women.[19]

We did not determine hysterectomy or other pelvic surgery as a risk factor for women UI, however findings of other studies are controversial. Hysterectomy for benign indications, irrespective of surgical technique, increased the risk for subsequent SUI surgery.[25] A meta-analysis did not find any evidence of different risk for SUI or UUI after hysterectomy.[26]

Evaluation of risk factors for most prevalent types of UI in our study shows only one significant risk factor for men UUI, age above 60. However, a Japanese study found that UI among men was the most prevalent at a younger age- 60-69 years.[15] The incidence of men with UI in our study corresponds to the data of the population-based study, where 80% of men population reported lower urinary tract symptoms (LUTS), but just 18% of them reported UUI.[27]

The prevalence of erection dysfunction in our study did not differ among men with and without symptoms of UI. Prostate cancer was found just in one-third of men with UI, but the evaluation of associations between types of UI and prostate cancer/ erection dysfunction showed them as significant risk factors for MUI in men. Age older than 60 was found to be significant for men MUI. Scientific literature determines SUI as a symptom associated with prostate cancer treatment.[28] The evaluation of men following radical prostatectomy (RP) and transurethral resection of the prostate (TURP) showed that 77% of men with UI following RP and 64% of men following TURP after 6 weeks were wet,[29] but our results did not correspond to those findings. Concomitant illnesses in our study did not show associations with men UI. But study of Parsons and colleagues determined the elevated fasting plasma glucose and diabetes in men as risk factors for benign prostatic hyperplasia.[30] Tikkenen and colleagues' study shows overall prevalence of UI in 22% of men with diabetes mellitus in comparison to 14% of those without the disease.[31]

Despite the fact that more than a half of participants in our study were overweight or obese, the BMI was not associated with risk for UI in both genders. The opposite findings were in the study of Chinese women, where the BMI > 28 kg/m^2 was associated with a risk for UI.[21] The Eltatawy and colleagues' study found that the bladder neck descent was more marked in obese women compared with normal weight women.[32]

In our study neither socioeconomic characteristics nor the level of education has been identified as a risk factor for UI. In other studies the prevalence of UI was higher among women with lower education,[17] or with a high educational level.[33] Depression/anxiety symptoms in our study were not determined as risk factors for UI. A study performed in the US reported that the UI group was almost twice as likely to feel depressed as the non UI group, and that UI had a significant negative impact on all aspects of quality of life. UI women had large role limitations caused by emotional problems, body pain, general health, and vitality domains.[11] Despite the fact that men in our study presented significantly lower HRQoL in comparison to women, we already could state, that UI affecting HRQoL in both genders: almost half of female with UI reported their HRQoL as low and UI in male patients diminished their HRQoL in 79%. Significantly lower HRQoL was reported by men with UUI and by women with SUI. We also found relations between lower HRQoL of men and older age, when symptoms of UI among men were more prevalent. Buckley and colleagues reported that any type of UI in men was significantly associated with reduced HRQoL.[29]

It is important to mention that management of modifiable risk factors as hypertension and glycaemia control is important in reducing the risk for UI. However the majority of evaluated risk factors are not modifiable

and UI requires active treatment interventions. In many cases proper treatment of UI can improve HRQoL and psychological well-being.[16] The main advantage of our study is that it was conducted in urban and rural areas and both gender subjects were enrolled, therefore, it represents a more informative patients' situation in the Lithuanian primary care. Using a wide range of questionnaires helped to recognize signs of UI even without patients' complaints and to evaluate the risk factors for UI. Absence of UI registry in Lithuania means that health care specialists provide help for patients individually, without team approach or general strategy. Despite the small sample size, our study should draw the attention to UI prevalence in general population. The evaluation of all age groups should be used in future studies, which would help to analyze the prevalence of different types of UI and their risk factors, as well as contribute to the development of UI registry and determine prevention and treatment strategies.

CONCLUSIONS

UI was common among middle-aged women and older men visiting GP. UI affected more women of the same age range. The frequency of UI was higher than previously assessed because this condition is neither recognized nor diagnosed. SUI was more prevalent among women, but UUI among men. Age below 60 years, being married, pregnancy and delivery history and concomitant illnesses were risk factors for women with SUI; older age and menopause for women with UUI. The only risk factor for men with UUI was age over 60 years. This study should encourage GPs to become increasingly aware on the recognition of UI among primary care patients.

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CONFLICT OF INTEREST

None declared.

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