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Lower urinary tract symptoms and quality of life in community-dwelling individuals aged 45 years and over. A population-based study

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ABSTRACT. The objective of this study was to identify the factors associated with the impairment of quality of life (QoL) in community-dwelling individuals with LUTS. A randomized sample of the population registered in the Family Health Program - Niterói aged 45 years or over was selected. Information about demographic, socioeconomic and lifestyle factors, co-morbidities and nocturia was collected. The NANDA-I taxonomy was used to identify the other LUTS, and QoL evaluation was performed in accordance with the SF-36 Short Form questionnaire (SF36-SF). For the SF36-SF domains (outcome) associated with LUTS, multiple logistic models were tested including the urinary symptoms and the sociodemographic and associated clinical variables. Stress urinary incontinence was associated with white skin, female gender, obesity, smoking, alcohol intake, depression and low scores in all evaluated domains of QoL. Nocturia was associated with advanced age, low schooling level, higher BMI, hypertension, diabetes, health insurance and the lowest scores in all evaluated domains of Qol, except for the Role Emotional. According to multivariate analysis, stress incontinence and depression are associated with the highest risks of low scores in General Health, Physical Functioning and Vitality domains, while nocturia and obesity showed association with the highest risks of low scores in Physical Functioning, Bodily-Pain and Vitality domains.

Keywords: community medicine; lower urinary tract symptoms; nocturia; quality of life.

Introduction

Lower urinary tract symptoms (LUTS) can be classified into urinary incontinence, storage, sensory, voiding and postmicturition symptoms (Haylen et al., 2010). They show strong association with age and gender, and for that reason, most of the studies have been conducted on women. For them, urinary incontinence symptoms (UI) are more common. Genetic factors, the structure of connective tissue and pelvic muscles, parity, obesity and post-menopausal period are factors associated with female UI (Moreira et al., 2013; Hunskaar et al., 2000). On the other hand, epidemiology of LUTS in men has been less studied and, apart from age, the main risk factors are the neurologic and prostatic diseases (Hunskaar et al., 2000). Currently, with changes in life expectancy and lifestyle, other risk factors for UI have emerged, such as chronic diseases and drugs used to treat them (Hall et al., 2012; Rebassa et al., 2013; Tannenbaum, Gray, Hoffstetter, & Cardozo, 2013).

The symptom of nocturia, considered the most common LUTS in many studies, is worth of attention. Age, obesity, and presence of hypertension and diabetes mellitus (DM), among others, are the main associated factors (Madhu et al., 2015).

Throughout the last decades, a gradual change in the age pyramid has been observed in Brazil, with the aging of the population. In this new scenario, there is a growing interest in the study on risk factors and prevalence of LUTS. According to studies carried out in the urban population of the South and Southeast regions of Brazil, women who had several pregnancies and births, with elevated body mass index (BMI), genital prolapse and DM, among other factors, presented higher risk of UI (Tamanini, Lebrão, Duarte, Santos, & Laurenti, 2009; Marques, Schneider, Giehl, Antes, & D'Orsi, 2015). On the other hand, socio-

economic and reproductive factors normally associated with stress urinary incontinence (SUI) were not confirmed in studies carried out in other regions of the country (Brito et al., 2012).

LUTS represent an additional cost burden for the health system and are related to poor health-related quality of life (QoL), lower labor productivity and, in the case of nocturia, to a high risk of falls and death (Abrams, Smith, & Cotterill, 2015; Bliwise, Rosen, & Baum, 2014; Kannan, Radican, Turpin, & Bolge, 2009; Moreira et al., 2013; Pinto & Neri, 2013). The impairment of QoL caused by UI seems to be related to the severity of urine leakage or to its clinical type, and the most affected domains vary depending on the questionnaires used in the studies and on the incontinence type (Asoglu, Selcuk, Cam, Cogendez, & Kareteke, 2014). For nocturia, the impact on QoL varies according to the studied population (Moreira et al., 2013; Suekane et al, 2016).

In primary health care, the approach of urinary symptoms should be carried out with the multidisciplinary team searching for health promotion and/or therapeutic actions. The NANDA taxonomy was developed by the former North American Nursing Diagnosis Association, nowadays the NANDA International (NANDA-I). NANDA-I taxonomy seeks for problems resulting from disorders in a variety of domains. The approach of urinary problems is made on the 'Elimination and Exchange' domain. The terminology used is based on definitions of international incontinence associations, as for urinary stress incontinence and urge urinary incontinence diagnosis.

This study, developed in individuals from strongly diverse communities from the Niteroi Family Health Program, aged between 45 and 99 years, most of them having income lower than the minimum wage in Brazil, aims to identify sociodemographic and clinical factors associated with the impairment of quality of life in individuals presenting lower urinary tract symptoms.

Material and methods

This study is part of the DIGITALIS study, a cross-sectional investigation of the prevalence of chronic diseases and their association with risk factors with a random two stages sample (sector and individuals in the sector) of a registered population in the Family Health Program (FHP) of Niteroi, Rio de Janeiro State, Brazil (Garcia Rosa et al., 2015). The sample size was calculated to estimate the prevalence and the measures of association, taking into consideration the feasibility of the study. The calculations predicted that it would be possible to assess 600 individuals, plus 10% for incomplete assessments (losses), in 18 months.

The units (sectors) to be included in the study were randomly selected from the official list of FHP sectors. For each sector, approximately 80 individuals of both genders between 45 and 99 years of age were randomly selected from the records of residents kept by the program. It was anticipated that 30 examinations would be conducted per visit. Thus, it was recommended that 50 residents be invited to account for non-attendance and that additional 30 names be collected for possible substitutions.

Visits were carried out from August 2011 to November 2012. Physicians and nurses were in charge of patient's medical history and physical examination. The participants responded to a questionnaire asking for information related to co-morbidities and demographic as well as socioeconomic and lifestyle factors. Schooling was assessed inquiring the grade the participant had reached, and for statistical analysis, the variable was divided into two groups (up to four years and five or more years). In addition, fasting blood samples were collected.

The 'Elimination and Exchange' domain of the Brazilian version of NANDA-I taxonomy was used to investigate urinary symptoms (Diagnósticos de Enfermagem da NANDA: definições e classificação, 2008). Individuals were asked if they had SUI (involuntary urine loss on sneezing or on cough) and about their inability to start and stop the urine stream and to recognize the desire to void, and about the ability to urinate in a proper location (meaning that they do not have loss of urine before reaching toilet) and to empty the bladder completely.

The DIGITALIS questionnaire investigated the presence of various co-morbidities, including renal disease. Among other conditions, patients were asked if they had to get up at night to urinate and those who referred waking up to urinate at least once at night were considered to have nocturia.

Individuals with blood pressure $\geqslant$ 140 mmHg (systolic) or $\geqslant$ 90 mmHg (diastolic) were considered hypertensive as well as those who reported using antihypertensive drugs. Participants whose fasting glucose was $\geqslant$ 126 mg dL^{-1} and those who reported the oral use of hypoglycemic agents and/or insulin were considered diabetic.

Skin color was classified by the participants as black, brown and white, and for statistical analyses, they were grouped in white and non-white (black and brown).

Male individuals who consumed on average more than two daily doses of alcohol, or females consuming more than one dose were considered consumers at risk.

People 60 years old or over were considered as elderly, according to the World Health Organization´s definition.

Body mass index (BMI) was calculated as the ratio of weight in kilograms and height in square meters. Patients with a BMI (kg m^{-2}) ⩾ 30 were considered obese (Kurisu et al., 2018).

For the classification of depression, the responses from the Patient Health Questionnaire-9 (PHQ-9) were used. Individuals with a score of 3, 4 or 5 (depression moderate, moderately severe and severe) were considered positive (Lima Osório, Vilela Mendes, Crippa, & Loureiro, 2009).

The general quality of life evaluation was performed using the Brazilian version of SF-36 Short Form (SF-36 SF) questionnaire. This scale consists of 36 questions, and yields subscale scores in the following domains: Vitality, Physical Functioning, Bodily Pain, General Health, Role Physical, Role Emotional, Role Functioning, Social Functioning and Mental Health.

The study protocol was approved by the Ethics Committee for Medical Research of the University Hospital Antônio Pedro (number 0077.0.258.000-10). All patients were informed about the objectives of the study and signed an Informed Consent Form.

Socio-demographic characteristics, clinical aspects and the scores of the SF-36 SF domains (below the 25th percentile and equal or higher than the 25th percentile) were presented in absolute and relative frequencies, according to the presence of urinary symptoms.

For the SF36 domains (outcome) associated with urinary symptoms with a significant level of 0.05, multiple logistic models were tested, including not only the urinary symptom itself but also the other variables associated with them. The minimum significance was set as 0.05.

Results

Of 661 individuals included in the study, 412 (62.3%) were female, 286 (43.3%) were over 60 years old, 179 (27.1%) presented SUI and 444 (67.2 %) presented nocturia. Regarding the domains of SF-36 SF questionnaire, scores below the 25th percentile were found for 123 (18.6 %) individuals in General Health, for 133 (20.1%) individuals in Physical Functioning, for 125 (18.9%) individuals in Social Functioning domain, for 121 (18.3%) individuals in Bodily Pain, for 159 (24.1%) individuals in Vitality and for 157 (23.8%) individuals in Role Emotional domain (Tables 1 and 2). None of the individuals referred negative impact on Mental Health and Role Physical domains.

The symptom of absence of voiding sensation was present in a very small number of individuals (eight cases) and, therefore, statistical tests were not carried out to evaluate their association with the scores of SF-36 SF.

There was a statistically significant association between the presence of SUI and gender (female > chance), skin color (white > chance), BMI (obese and overweight > chance), smoking (reduced chance) and depression symptoms (table 1). Moreover, for nocturia, it was observed association with the age group (aging > chance), BMI (obese and overweight > chance), hypertension, diabetes, low schooling and absence of health insurance (Table 1).

SUI showed positive and independent association with scores below the 25th percentile in General Health and Physical Functioning domains of the SF-36 SF. It is worth mentioning the strong positive and independent association of the depression symptoms with the worst scores in all domains of that questionnaire (Table 3).

The symptom of nocturia showed positive and independent association with scores below the 25th percentile in the Physical Functioning, Bodily Pain, General Health, Social Functioning and Vitality domains (Table 4).

Table 1. Association of socio-demographic factors and depression with urinary symptoms identified through the NANDA I taxonomy and nocturia.

		Reach toilet in time[1]	Stress urinary incontinence	Inhibit/initiate voiding[2]	Empty bladder[3]	Nocturia
Sex		p = 0.52	p < 0.001	p = 0.003	p = 0.14	p = 0.12
	Female	21 (5.3%)	148 (37.9%)	55 (14.1%)	36 (9.2%)	284 (68.9%)
	Male	13 (5.6%)	31 (13.2%)	16 (6.8%)	15 (6.4%)	160 (64.3%)
Age group		p = 0.02	p = 0.49	p < 0.001	p = 0.027	p = 0.019
	≥ 60 years	21 (7.8%)	77 (28.9%)	44 (16.4%)	29 (10.8%)	205 (71.7%)
	45-59 years	13 (3.6%)	102 (28.5%)	27 (7.6%)	22 (6.2%)	239 (63.7%)
Skin color		p = 0.50	p = 0.03	p = 0.37	p = 0.25	p = 0.18
	White	13 (5.7%)	76 (33.5%)	24 (10.5%)	16 (7%)	154 (64.7%)
	Not white	21 (5.4%)	102 (26.2%)	46 (11.8%)	35 (9%)	285 (68.5%)
Schooling		p = 0.02	p = 0.19	p = 0.048	p = 0.20	p = 0.002
	Up to 4 yrs.	21 (8%)	81 (30.7%)	37 (14.1%)	25 (9.5%)	205 (73.5%)
	≥ 5 yrs.	13 (3.6%)	97 (27.1%)	34 (9.4%)	26 (7.2%)	238 (62.6%)
Income[4]		p = 0.07	p = 0.35	p = 0.38	p = 0.13	p = 0.50
	Up to 800	28 (6 %)	136 (29.2%)	53 (11.4%)	34 (7.3%)	332 (67.5%)
	>800	4 (2.6%)	40 (27%)	15 (10%)	16 (10.7%)	106 (67.1%)
Insurance[5]		p = 0.21	p = 0.54	p = 0.17	p = 0.50	p = 0.026
	No	31(5.9%)	150(28.6%)	57 (10.9%)	42 (8%)	380 (68.6%)
	Yes	3 (3.2%)	27 (28.7%)	14 (14.9%)	8 (8.5%)	58 (58%)
Smoking[6]		p = 0.09	p = 0.01	p = 0.29	p = 0.51	p = 0.056
	Yes	3 (2.6%)	23 (19.7%)	11 (9.4%)	9 (7.7%)	72 (60.5%)
	No	31 (6.1%)	156 (30.8%)	60 (11.8%)	42 (8.3%)	372 (68.6%)
Alcohol[7]		p = 0.61	p = 0.012	p = 0.50	p = 0.48	p = 0.10
	Yes	3 (5.2%)	9 (15%)	7 (12.1%)	4 (6.9%)	46 (75.4%)
	No	31 (5.4%)	170 (30%)	64 (11.3%)	47 (8.3%)	398 (66.3%)
BMI		p = 0.93	p < 0.001	p = 0.08	p = 0.30	p = 0.035
	Obesity	11 (5.8%)	71 (37.8%)	26 (13.8%)	16 (8.6%)	148 (74%)
	Overweight	11 (5.6%)	65 (33.3%)	25 (12.8%)	11 (5.6%)	155 (62.5%)
	Normal	12 (5%)	42 (17.6%)	18 (7.6%)	23 (9.6%)	155 (62.5%)
Hypertension		p = 0.02	p = 0.18	p = 0.038	p = 0.21	p = 0.008
	Yes	30 (5.4%)	135 (29.8%)	58 (12.8%)	34 (7.5%)	336 (70%)
	No	4 (2.3%)	44 (25.7%)	13 (7.5%)	17 (9.9%)	108 (59.7%)
DM		p = 0.14	p = 0.09	p = 0.011	p = 0.54	p = 0.001
	Yes	11 (7.4%)	49 (33.3%)	25 (16.9%)	12 (8.1%)	125 (77.2%)
	No	22 (4.7%)	127 (27.1%)	25 (16.9%)	12 (8.1%)	313 (64%)
Depression		p = 0.55	p = 0.001	p = 0.14	p = 0.27	p = 0.16
	Yes	7 (5.2%)	53 (39.8%)	19 (14.4%)	13 (9.8%)	101 (71.1%)
	No	27 (5.5%)	126 (25.8%)	52 (10.6%)	38 (7.7%)	341 (66.2%)

Caption: BMI – body mass index; DM – diabetes mellitus; [1]Inability to reach toilet in time; [2]Inability to initiate/inhibit voiding; [3]Completely empties bladder; [4]Per capita income; [5]Health insurance; [6]Current smoking; [7]Risk dosage.

The inability to initiate or inhibit voiding symptom showed positive and independent association with scores below the 25th percentile in the Physical Functioning domain [OR = 2.28 (IC 1, 27-3.91); p = 0.005], as well as for age [OR 1.02 (1.00-1.05); p = 0.02] and low schooling [OR = 1.66 (IC 1.08-2.55); p = 0.02]. On the other hand, it was found a negative and independent association [OR 0.51 (0.32-0.81); p = 0.004] on male individuals.

A positive and independent association with scores below the 25th percentile for the General Health domain was observed for the inability to reach a toilet in time to avoid urine loss [OR = 2.75 (IC 1.29-5.87; p = 0.009] and for low schooling [OR = 1.77 (IC 1.15-2.71; p = 0.01], while the age showed negative and independent association [OR = 0.98 (IC 0.96-1.00); p = 0.03]. Moreover, there was an association of that urinary symptom with the limitations by Social Functioning [OR = 2.24 (IC 1.04-4.80); p = 0.04] and Physical Functioning [OR = 2.52 (IC 1.193-5.37); p = 0.016] domains. In the latter case, the association with age [OR = 1.02 (IC 1.00-1.04); p = 0.03] and low schooling [OR = 1.79 (IC 1.18-2.73; p = 0.007] has also been found.

The inability to empty completely the bladder showed association with the General Health [OR = 2.09 (IC 1.10-4.00); p = 0.03], Bodily Pain [OR = 2.33 (IC 1.23-4.41); p = 0.009] and Physical Functioning [OR = 3.92 (IC 2.11-7.26); p < 0.01] domains. For the Physical Functioning domain, it was also observed an association with age [OR = 1.04 (IC 1.02-1.06; p < 0.01].

Table 2. Association of scores below the 25th percentile in the domains of the SF-36-SF questionnaire with urinary symptoms identified through NANDA I taxonomy and nocturia[§].

		Reach toilet[1]	SUI	Inhibit/initiate voiding[2]	Empty bladder[3]	Nocturia
GHP		p = 0.02	p < 0.01	p = 0.16	p = 0.05	p < 0.01
	< 25th percentile	12 (35.3%)	49 (27.4%)	18 (25.4%)	15 (29.4%)	97 (21.8%)
	> 25th percentile	105 (17.6%)	68 (15.2%)	98 (17.8%)	100 (17.4%)	26 (5.2%)
Bodily Pain		p = 0.58	p = 0.05	p = 0.15	p = 0.02	p = 0.03
	< 25th percentile	8 (23.5%)	42 (23.6%)	18 (25.4%)	16 (326%)	92 (21.1%)
	>25th percentile	106 (18.2%)	72 (16.5%)	95 (17.5%)	97 (17.2%)	29 (13.7%)
Social Functioning		p = 0.07	p = 0.03	p = 0.30	p = 0.45	p = 0.02
	< 25th percentile	11 (32.4%)	44 (24.7%)	17 (23.9%)	12 (23.5%)	95 (21.9%)
	>25th percentile	106 (18.2%)	72 (16.6%)	98 (18.1%)	102 (18.1%)	30 (14.1%)
Emotional Role		p = 0.71	p = 0.02	p = 0.75	p = 0.93	p = 0.14
	< 25th percentile	7 (20.6%)	56 (31.5%)	19 (26.8%)	13 (26%)	113 (26%)
	> 25th percentile	146 (25.0%)	96 (22.0%)	132 (24.2%)	138 (24.4%)	44 (0.5%)
Vitality		p = 0.33	p < 0.01	p = 0.10	p = 0.90	p = 0.01
	< 25th percentile	11 (32.4%)	56 (31.3%)	23 (32.4%)	13 (25.5%)	123 (27.6%)
	> 25th percentile	140 (23.5%)	94 (21%)	126 (22.7%)	136 (23.6%)	36 (7.3%)
Physical Functioning		p < 0.01	p < 0.01	p < 0.01	p < 0.01	p < 0.01
	< 25th percentile	14 (43.8%)	54 (31%)	26 (37.7%)	23 (47.9%)	104 (23.9%)
	> 25th percentile	111 (19.1%)	70 (16%)	98 (18%)	100 (17.7%)	29 (13.8%)

Caption: [§]None of the individuals referred negative impact on Mental Health and Role-Physical domains. [1]Inability to reach toilet in time; [2]Inability to initiate/inhibit voiding; [3]Completely empties bladder; SUI – Stress urinary incontinence; GHP – General Health Perception.

Table 3. Multivariate analysis of factors associated with scores below the 25th percentile in the domains of the SF36-SF in patients with stress urinary incontinence.

	GHP	Physical Functioning	Social Functioning	Role Emotional	Vitality
SUI	p = 0.044	p = 0.004	p = 0.51	p = 0.43	p = 0.047
Yes	1.54(1.01-2.35)	1.84(1.23-2.92)	1.18(0.72-1.92)	1.21(0.78-1.88)	1.54 1.01-2.37)
No	1	1	1	1	1
Sex	p = 0.29	p = 0.13	p = 0.80	p = 0.001	p = 0.003
Female	1.27(0.82-1.95)	0.70(0.44-1.12)	0.93(0.56-1.56)	0.44(0.27-0.70)	0.50(0.32-0.78)
Male	1	1	1	1	1
BMI		p > 0.05	p > 0.05	p > 0.05	p > 0.05
Obesity	No	1.51(0.88-2.62)	1.23(0.67-2.27)	0.92(0.54-1.58)	1.60(0.93-2.75)
Overweight	No	1.34(0.80-2.42)	1.20 (0.68-2.13)	0.84(0.51-1.39)	1.51(0.91-2.50)
Normal	No	1	1	1	1
Skin color	p = 0.98	p = 0.02	p = 0.17	p = 0.63	p = 0.49
White	1.01 (0.68-1.50)	1.68(1.09-2.60)	0.72(0.45-1.15)	1.11(0.73-1.70)	1.16(0.76-1.75)
Not white	1	1	1	1	1
Smoking[1]	p = 0.35	p = 0.49	p = 0.25	p = 0.056	p = 0.51
Yes	0.83(0.56-1.23)	1.22(0.70-2.13)	1.46(0.77-2.78)	0.60(0.36-1.01)	0.84(0.49-1.42)
No	1	1	1	1	1
Alcohol [2]	p = 0.46	p = 0.28	p = 0.37	p = 0.18	p = 0.46
Yes	1.27 (0.69-2.41)	0.65(0.30-1.42)	0.67(0.28-1.60)	0.58(0.27-1.27)	0.76(0.36-1.59)
No	1	1	1	1	1
Depression	p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001	p < 0.0001
Yes	3.69(2.41-5.64)	3.85(2.49-5.95)	6.79(4.23-10.91)	7.05(4.53-10.98)	6.75(4.32-10.54)
No	1	1	1	1	1

GHP – General Health Perception; SUI – Stress urinary incontinence; [1]Current smoking; [2]Risk doses.

Discussion

In the present study, people with urinary symptoms identified through the NANDA-I taxonomy nursing diagnoses and nocturia had a greater risk of presenting lower scores of QoL on the SF-36 questionnaire than those who do not have such symptoms. The different urinary symptoms were associated with negative impact on different dimensions of the SF-36, and the General Health, Social Functioning, Role Emotional, Vitality and Physical Functioning domains had a greater risk of the worst scores.

Table 4. Multivariate analysis of factors associated with scores less than the 25th percentile in the SF36-SF domains in patients with nocturia.

		GHP	Physical functioning	Social functioning	Bodily pain	Vitality
Nocturia		p = 0.03	p = 0.013	p = 0.05	p = 0.03	p = 0.045
	Yes	1.59(1.05-2.38)	1.76(1.13-2.74)	1.59(1.00-2.52)	1.60(1.05-2.43)	1.49(1.01-2.21)
	No	1	1	1	1	1
Age		p = 0.26	p < 0.0001	p = 0.31	p = 0.21	p = 0.22
		0.99(0.97-1.01)	1.04(1.02-1.06)	1.01(0.99-1.03)	0.99(0.97-1.01)	0.99(0.97-1.01)
Schooling		p = 0.38	p = 0.003	p = 0.18	p = 0.74	p = 0.26
	Up to 4	1.20(0.81-1.75)	1.82(1.22-2.73)	0.74(0.48-1.15)	1.07(0.72-1.59)	1.24(0.85-1.79)
	≥ 5 yrs.	1	1	1	1	1
BMI						
	Obesity	p = 0.45	p = 0.01	p = 0.10	p = 0.02	p = 0.04
		1.19(0.76-1.88)	1.87(1.16-3.06)	1.54(0.92-2.59)	1.73(1.09-2.74)	1.59(1.02-2.47)
	Overweight	p = 0.59	p = 0.41	p = 0.21	p = 0.47	p = 0.13
		0.88(0.56-1.39)	1.22(0.76-1.98)	1.38(0.83-2.28)	1.19(0.74-1.89)	1.40(0.91-2.15)
Normal		1	1	1	1	1
	AH	p = 0.41	p = 0.91	p = 0.21	p = 0.66	p = 0.27
	Yes	0.84(0.54-1.28)	1.03 (0.64-1.65)	0.74(0.46-1.19)	1.10(0.71-1.72)	1.27(0.83-1.94)
	No	1	1	1	1	1
DM		p = 0.004	p = 0.25	p = 0.10	p = 0.40	p = 0.54
	Yes	1.81(1.20-2.73)	1.29(0.84-1.97)	1.46(0.93-2.29)	1.20(0.79-1.84)	1.13(0.76-1.70)
	No	1	1	1	1	1
Insurance[1]		p = 0.62	p = 0.64	p = 0.32	p = 0.30	p = 0.27
	Yes	1.15(0.67-1.95)	0.88(0.51-1.51)	1.35(0.75-2.45)	0.76(0.46-1.27)	1.34(0.80-2.25)
	No	1	1	1	1	1

GHP – General Health Perception; BMI – body mass index; AH – arterial hypertension; DM – diabetes mellitus Health insurance[1].

Nocturia is a highly prevalent LUTS (Tikkinen et al., 2009; Wang et al., 2015). We observed its association with increasing age, obesity, hypertension and diabetes, and it is in accordance with the literature (Madhu et al., 2015). Moreover, there was an association with low schooling and the absence of health insurance, and both conditions are more common in older individuals. According to the literature, nocturia is a multifactorial symptom related to age and comorbidities. Its treatment is often neglected in individuals of poor socioeconomic conditions, as the studied population. Thus, structural and functional changes in lower urinary tract with aging, poor control of diabetes, diuretics use for hypertension, kidney function changes in circadian cycle and edema reabsorption in the night period, among others, might explain the observed associations (Wang et al., 2015).

Nocturia has a negative impact on the QoL in some populations, while is well tolerated in others (Abdel Rahman & El Gaafary, 2014; Moreira et al., 2013; Oelke, Wiese, & Berges, 2014; Suekane et al., 2016). In the present study, the multivariate analysis showed association of nocturia with worst scores in the General Health, Social Functioning, Bodily Pain, Vitality and Physical Functioning domains. In the case of those three latter domains, it is important to point out that not only nocturia but also age and obesity are associated with a greater risk of poor QoL scores. These variables are closely correlated, as the prevalence of nocturia increases with age and with the co-morbidities associated with nocturia, such as hypertension and DM. Besides, obesity is related to snoring, sleep apnea syndrome, and nocturia (Bower, Whishaw, & Khan, 2017).

Individuals presenting nocturia might not rest adequately at night, which could reflect in stress and impaired performance of daily activities, and it could explain the greater risk of low scores in the Physical Functioning dimension, that is also influenced by obesity and age. In addition, the sleep disruption can lead individuals to feel less energized for the daily activities and avoid social activities, which reflected in even worse scores of the Social Functioning and Vitality dimensions. All these factors can also justify the low scores on the General Health dimension.

The NANDA-I taxonomy refers to the standardization of terminology of the international incontinence associations to identify problems resulting from urinary disorders. The inability to reach a toilet in time to avoid urine loss is a defining characteristic of NANDA's urge urinary incontinence diagnosis, and the inability to voluntarily inhibit or initiate voiding is a defining characteristic of the reflex urinary incontinence nursing diagnosis, related to neurological diseases (Diagnósticos de Enfermagem da NANDA: definições e classificação, 2008). These symptoms are associated with bad scores of general QoL and with a

greater specific negative impact on QoL, probably because they are much less predictable and controllable, causing more embarrassment.

The inability to reach a toilet in time to avoid urine loss was associated with age, hypertension, and low schooling, while inability of voluntarily inhibit or initiate voiding showed association not only with those variables but also with the female gender and diabetes. Symptoms of urgency and of urge-incontinence prevails in the older population (Hunskaar et al., 2000). Wang et al. (2015) have also found a greater risk of LUTS with increasing age, which was associated with low schooling and DM in men and with hypertension in women.

Those results could be explained by the fact that co-morbidities are more frequent in older people and that LUTS can be the consequence of peripheral diabetic neuropathy (Tannenbaum et al., 2013). Besides, pelvic floor dysfunction is more common in women because of damage related to pregnancy and vaginal delivery, and that could be the reason why LUTS was associated with female gender (Hunskaar et al., 2000).

Interestingly, for the inability to voluntarily inhibit or initiate voiding, men have less impairment of the QoL than women, probably due to cultural factors. This observation is in accordance with Moreira et al. (2013), whose results showed that, in general, women are more affected by LUTS when compared to men.

Both the inability to reach a toilet in time to avoid urine loss and to voluntarily inhibit or initiate voiding are associated with a greater risk of inferior scores of QoL in the General Health, Social Functioning, and Physical Functioning domains. Those symptoms can cause embarrassment, affecting the activities in the social group the individual belongs to, and leading to frequent interruptions of the daily activities, justifying the poor perception of health and the low scores in the Physical Functioning dimension.

SUI is more common in women and was associated with skin color, obesity, smoking and depression in the present study. These findings are in accordance with the literature (Hall et al., 2012; Moreira et al., 2013) and again it might be explained by the damage of pelvic floor that occurs during pregnancy and delivery (Hunskaar et al., 2000). Furthermore, a statistically significant association was found between SUI and General Health, Social Functioning, Physical Functioning, Role Emotional and Vitality domains of SF-36 SF.

When submitted to multivariate analysis, depression, but not SUI, showed strong association with low scores of QoL in Role Emotional and Social Functioning domains. On the other hand, the association of SUI with poor scores of QoL in the General Health, Vitality and Physical Functioning domains of the SF-36 persisted, regardless of the depression.

It is important to highlight that depression is more common in women, which could explain its strong association with SUI. Usually, it is not possible to identify whether depression is involved with the UI physiopathology, or whether it worsens the perception of the symptom, or indeed whether it is the result of the UI.

A study carried out in Australia showed a higher rate of depression in individuals with urinary incontinence – without specifying the type. The female gender was associated with both conditions, and individuals who presented them showed poor scores in all the domains of the SF-36 questionnaire when compared with those without UI and depression, and with those with UI without depression (Avery et al., 2013). In the present study, we observed low scores only in some of the domains, which might be explained by the different methods to investigate depression and urinary symptoms, as the NANDA methodology uses the term 'incontinence' only in the evaluation of SUI.

The UI symptom is one of the several factors associated with higher risk for low life satisfaction in elderly individuals over 65 years, according to the FIBRA study (Pinto & Neri, 2013). Individuals with UI try to deal with condition avoiding risks and embarrassment through changes in their behavior and practices, which could reduce social contact and activities outdoors, leading to social isolation. This is in accordance with the higher risk of poor scores in the limitations by Social Functioning, Physical Functioning, and General Health dimensions found in the present study.

Although the present research is limited by its sample size and its use of questions not standardized for investigation of LUTS, its importance lies on the fact that previous publications about urinary complaints identified through the NANDA's taxonomy have not been found, as well studies about their association with the negative impact on the QoL. Furthermore, the study was performed on the general population, and evaluated the association of urinary symptoms with the scores of each domain of a general QoL questionnaire, taking into consideration the interference of socio-demographical factors and co-morbidities.

According to the literature, lower urinary tract symptoms represent an additional cost for the health system and are associated with a poor health-related quality of life, lower labor productivity and, in the case of nocturia, to a greater risk of falling and death (Abrams et al., 2015; Bliwise et al., 2014; Kannan et al., 2009).

The use of NANDA-I taxonomy of nursing diagnosis to address individuals with urinary complaints showed association of such symptoms with worst QoL and emphasizes that all efforts should be done by the health multidisciplinary team in order to better understand these conditions and minimize its effects on the general population through prevention and treatment measures.

Conclusion

Lower urinary tract symptoms are independently associated with higher risk of lower scores in SF-36 SF domains. However, other variables, mainly depression and obesity, play a role in the impairment of QoL in this Brazilian community-dwelling population with LUTS.

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