Prevalence of lower urinary tract symptoms in taxi drivers: a cross-sectional web-based survey

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Article

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Abstract

Purpose:

Aim of the study was to evaluate the prevalence of LUTS in taxi drivers.

Methods

Between February 24th 2021 and March 26th 2021 a web based survey was administered to Taxi drivers in the city of Florence. Taxi drivers were evaluated with baseline characteristics such as: age, BMI, smoking, career length, comorbidities, and treatment. LUTS were evaluated using the international prostate symptom score (IPSS) and the Overactive Bladder (OAB) score. As well sexual function was evaluated using the International Index Erectile Function (IIEF) and FSFI (Female Sexual Function Index) questionnaires. Risk factors for LUTS were evaluated using regression analysis.

Results

The overall response rate was 64.6% (537/830 taxi drivers filled the questionnaires). Among them, 449 (83.6%) were men and 88 (16.4%) females. Overall, median IPSS was 5 (2/9) and median OAB score was 10 (7/14). On multivariate binary regression analysis age>50 (OR:1.60; p<0,05), Smoking (OR:1.57; p<0,05), chronic treatment (OR:1.57; p<0,05), recurrent cystitis (OR: 2.66; p<0,05) and chronic pelvic pain (OR:4.94; p<0,05) were independent risk factors for moderate/severe LUTS. On multivariate binary logistic regression analysis, risk factors for erectile dysfunction were age older than 50 years (OR=3.64; p<0.05) and urinary incontinence (OR=5.53; p0.005).

Conclusions

According to our web-based survey, Taxi drivers in the metropolitan city of Florence had non-negligible symptomatic LUTS and even sexual dysfunction. Our data suggest as LUTS are particular influenced by several life style and behavioural factors as type and duration of work.

INTRODUCTION

Lower urinary tract symptoms (LUTS) are widely spread among the population, especially due to ageing in both male and women patients[1]. The development of LUTS is multifactorial and many risk factors have been identified with different prevalence rate worldwide[2, 3]. Age and some chronic diseases such as diabetes, chronic pulmonary obstructive disease and chronic heart disease may have a role in LUTS pathogenesis, suggesting potential targets for prevention[4–8].

LUTS may have an important negative impact on quality of life[9]. LUTS can lead to emotional distress, reduced quality of life, disruptions in daily activities, and decreased work performance. Several studies have evaluated the possible role of different works, shifts and vacation on urinary symptoms underlying

the importance of jobs and job conditions on LUTS[10]. In particular studies on nurses have underlined the importance of work conditions on the development of LUTS[11, 12].

Taxi drivers, as well as other professional drivers categories, may experience genitourinary disturbances such as voiding dysfunction, urinary infections but also infertility, urolithiasis, bladder cancer, also called “taxi cab syndrome”[13]. However, data on the real-life prevalence of LUTS among them are not yet well-explored, leading to the uncertainty of their potential negative impact on this specific working pattern. Taxi drivers have very specific job conditions which may influence the development of LUTS such as stress, nigh-shifts and sedentary job conditions. Moreover, the impact of LUTS on their quality of life is different considering they may not always have a bathroom nearby. With this knowledge in mind aim of our study was to evaluate the prevalence of LUTS in Taxi drivers and to identify possible risk factors in this category of workers.

MATERIALS AND METHODS

Study Design

A cross-sectional web-based anonymous Survey was developed using Google Forms according to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) was administered to Taxi drivers between February 24th 2021 and March 26th 2021[14]. The survey remained open for 1 month. Baseline features (i.e. age, BMI, smoking, career length, comorbidities and treatment) were collected. As well presences of chronic treatment, recurrent cystitis and pelvic pain was recorded. All participants had to fill out the International Prostatic Symptoms Score (IPSS) and Overactive Bladder questionnaire-short form (OABq-SF) to evaluate the impact of LUTS[15, 16]. An IPSS score ≥ 8 was considered as an expression of moderate/severe LUTS while an OABq- SF score ≥ 18 as an expression of troublesome OAB. Regarding sexual function, International Index Erectile Function (IIEF) and FSFI (Female Sexual Function Index) questionnaires were administered, thus FSFI ≤ 26 was index of female sexual dysfunction, while erectile dysfunction was categorized according IIEF questionnaire in absent, mild, mild to moderate, moderate and severe[17, 18]. Patients were divided in groups according to moderate to severe LUTS presence or absence and according to OAB presence. A further analysis according to gender was conducted.

Study Population

Registered taxi drivers in the city of Florence were considered eligible for study enrolment. All registered taxi drivers were emailed and contacted. According to official data of the Local Taxi Drivers Associations, a total of 830 drivers were active in the city’s area on February 24th 2021.

Statistical Analysis

A descriptive statistical analysis was conducted among participants. Further comparisons between groups with IPSS < 8 and ≥ 8 were carried out with Fisher’s Exact Test, Chi-Square and Mann-Whitney U-test, as appropriate. Multivariate logistic regression analysis was used to investigate the potential predictors of moderate-to-severe LUTS (IPSS score ≥ 8) among the available covariates and were

reported as Odds Ratio (OR) and 95% Confidence Interval (CI). Analogue comparisons were conducted according to OAB presence (OABscore ≥ 8) and sexual dysfunction (IIEF < 22; FSFI≤ 26).

Ethical Appraisal

Current study was conducted according to the Helsinki Declaration. Survey was first evaluated by the Careggi University Hospital and second by the Local Taxi Driver Associations. After appraisal by both organizations, survey was then administered to Taxi Drivers through official channels by the Local Taxi Driver Associations. Furthermore, anonymous data collection allowed to respect the privacy of all participants.

RESULTS

3.1 General characteristics

The overall response rate was 64.6% (537/830 taxi drivers filled the questionnaires). Among them, 449 (83.6%) were men and 88 (16.4%) women, all of them were included in the analysis and their characteristics are reported in Table 1. Gender based differences were found, as female drivers had a lower median BMI (22.5 Kg/m^2 vs 25.7Kg/m^2 $p < 0.001$), were younger (70% vs 50% under 50) and they were driving the Taxi for lesser time (59% vs 38% less than 10 years) ($p < 0.001$). Moreover, also anxiety/depression (9% vs 2%; $p < 0,001$) and recurrent Urinary Tract Infections (UTIs) exposure were statistically higher (18% vs 2%; $p < 0.001$). On the contrary, male drivers were more prone to to hypertension (20% vs 7%; $p = 0.003$).

Table 1
– Taxi drivers' characteristics at Survey time and further comparison according to gender

		All patients (n = 537)	Male (n = 449)	Females (n = 88)	p
Age (years)	< 35	72 (13.4%)	50 (11.1%)	22 (25.0%)	**< 0.001**
	36–50	212 (39.5%)	172 (38.3%)	40 (45.5%)	
	51–65	253 (47.1%)	227 (50.6%)	26 (29.5%)	
BMI (Kg/m^2)		25.2 (23.3–28.1)	25.7 (23.9–28.4)	22.5 (20.6–25.2)	**< 0.001**
How long have you been a Taxi driver? (years)	< 5	117 (21.8%)	94 (20.9%)	23 (26.1%)	**< 0.001**
	5–10	105 (19.5%)	76 (16.9%)	29 (32.9%)	
	> 10	315 (58.7%)	279 (62.1%)	36 (40.9%)	
Smoke habit		155 (28.9%)	122 (27.2%)	33 (37.5%)	0.051
Hypertension		96 (17.9%)	90 (20.0%)	6 (6.8%)	**0.003**
Diabetes		6 (1.1%)	6 (1.3%)	0	0.275
LUTS treatment		17 (3.8%)	17 (3.8%)	0	**< 0.001**
Depression/Anxiety		15 (5.4%)	7 (1.6%)	8 (9.1%)	**< 0.001**
Urinary Incontinence		29 (5.4%)	23 (5.1%)	6 (6.8%)	0.604
Recurrent UTIs		27 (5.0%)	11 (2.4%)	16 (18.2%)	**< 0.001**
Chronic Pelvic Pain		20 (3.7%)	14 (3.1%)	6 (6.8%)	0.117
Previous genitourinary surgery		43 (8.0%)	31 (4.8%)	12 (13.6%)	**0.033**

Legend: BMI = Body Mass Index; LUTS = Lower Urinary Tract Symptoms; UTIs = Urinary tract infections. Continuous variables are expressed as Median (Interquartile range), while categorical as n (%). Mann-Whitney U-test, Chi-square or Fisher's Exact Test statistical analysis for comparisons between genders were conducted as appropriate

3.2 Risk of moderate severe LUTS (IPSS ≥ 8)

Overall, 156/537 (29%) presented moderate/severe LUTS (IPSS ≥ 8). Taxi drivers with moderate/severe LUTS were older (55% vs 43% older than 50y), smoked more frequently (35%vs26%; p < 0,05), took chronic treatments more frequently (44%vs 31%; p < 0,05), referred more frequently recurrent cystitis (9% vs 3%; p < 0,05) and referred more frequently chronic pelvic pain (8% vs 2%; p < 0,05) (Table 2). On

multivariate binary regression analysis age > 50 (OR:1.60; p < 0,05), Smoking (OR:1.57; p < 0,05), chronic treatment (OR:1.57; p < 0,05), recurrent cystitis (OR: 2.66; p < 0,05) and chronic pelvic pain (OR:4.94; p < 0,05) were independent risk factors for moderate/severe LUTS (Table 3).

Table 2
– Characteristics of Taxi drivers with moderate-severe LUTS (IPSS ≥ 8) when compared to Taxi drivers with mild/no LUTS.

		IPSS < 8 N:364	IPSS ≥ 8 N: 173	p
Sex	**M/F**	313/136	51/37	0,034
Age (years)	**< 35**	55 (15%)	17 (10%)	0.021
	36–50	152 (42%)	60 (35%)	
	51–65	157 (43%)	96 (55%)	
BMI (Kg/m^2)		25.2 (23.4–28.1)	25.1 (23.1–27.7)	0.658
How long have you been a Taxi driver? (years)	**< 5**	83 (23%)	34 (20%)	0.571
	5–10	73 (20%)	32 (19%)	
	> 10	208 (57%)	107 (62%)	
Smoke habit		95 (26%)	60 (35%)	0.040
Chronic treatment		113 (31%)	77 (45%)	0.003
Hypertension		62 (17%)	34 (20%)	0.471
Diabetes		3 (1%)	3 (2%)	0.393
LUTS treatment		3 (1%)	14 (8%)	0.001
Depression/Anxiety		7 (2%)	8 (5%)	0.093
Urinary Incontinence		8 (2%)	21 (12%)	0.001
Recurrent UTIs		11 (3%)	16 (9%)	0.005
Chronic Pelvic Pain		7 (2%)	13 (8%)	0.003
Previous genitourinary surgery		20 (6%)	11 (6%)	0.545

Table 3
Univariate and multivariate regression analysis to evaluate the risk of moderate/severe LUTS

		Univariate	p	Multivariate	p
Sex	**M/F**	1.67 (1.05–2.67)	0.032	1.60 (0.95–2.71)	0.079
Age (years)	**< 35**	REF	REF	REF	
	36–50	1,27 (0,69 – 2,34)	0.440	1.51 (0.78–2.92)	0.218
	51–65	1.97 (1.08–3.60)	0.026	2.67 (1.39–5.15)	0.003
BMI (Kg/m^2)		25.2 (23.3–28.1)	25.7 (23.9–28.4)		
How long have you been a Taxi driver? (years)	**< 5**	REF			
	5–10	1.07 (0.60–1.90)	0.818		
	> 10	1.26 (0.79–1.99)	0.334		
Smoke habit		**1.50 (1.01–2.22)**	**0.041**	1.57 (1.06–2.35)	0.032
Chronic treatment		**1.78 (1.23–2.59)**	**0.002**	1.57 (1.05–2.35)	0.026
Hypertension		1.19 (0.75–1.90)	0.459		
Diabetes		2.12 (0.42–10.6)	0.359		
LUTS treatment		**11.6 (3.3–42)**	**0.001**		
Depression/Anxiety		2.47 (0.88–6.93)	0.085		
Urinary Incontinence		**6.15 (2.66–14.2)**	**0.001**		
Recurrent UTIs		**3.27 (1.48–7.21)**	**0.003**	2.66 (1.15–6.18)	0.022
Chronic Pelvic Pain		**4.14 (1.62–10.6)**	**0.003**	4.94 (1.86–13.1)	0.001
Previous genitourinary surgery		1.28 (0.60–2.77)	0.515		

3.3 Risk of OAB (OABq- SF score ≥ 18)

Overall, 55/537 (10%) presented OAB (OABq- SF score ≥ 18). Taxi drivers with OAB were younger (26% vs 12% younger than 35y; p < 0,05), referred more frequently depression/anxiety (9% vs 2%; p = 0.013) recurrent cystitis (15% vs 4%; p < 0,05) and referred more frequently chronic pelvic pain (9% vs 2%; p < 0,05) (Table 4). On multivariate binary regression analysis only depression/anxiety was an independent predictor of OAB (OR = 7.69; p < 0,05) (Table S1).

Table 4
– Characteristics of Taxi drivers with OAB when compared to Taxi drivers no OAB.

		OABq- SF score < 18 N:482	OABq- SF score ≥ 18 N: 55	p
Sex	**M/F**	415/67	34/21	0.001
Age (years)	**< 35**	58 (12%)	14 (26%)	0.011
	36–50	197 (41%)	15 (27%)	
	51–65	227 (47%)	26 (47%)	
BMI (Kg/m^2)		25.6 (24.3–27.7)	24.7 (23.6–27.4)	0.123
How long have you been a Taxi driver? (years)	**< 5**	109 (23%)	8 (15%)	0.275
	5–10	91 (19%)	14 (25%)	
	> 10	282 (59%)	33 (60%)	
Smoke habit		139 (29%)	16 (29%)	1.000
Chronic treatment		166 (34%)	24 (44%)	0.183
Hypertension		89 (19%)	7 (13%)	0.356
Diabetes		5 (1%)	1 (2%)	0.479
LUTS treatment		11 (2%)	6 (11%)	0.001
Depression/Anxiety		10 (2%)	5 (9%)	0.013
Urinary Incontinence		16 (3%)	13 (24%)	0.001
Recurrent UTIs		19 (4%)	8 (15%)	0.003
Chronic Pelvic Pain		15 (3%)	5 (9%)	0.044
Previous genitourinary surgery		27 (6%)	4 (7%)	0.279

3.4 Sexual Dysfunction (IIEF < 22)

Sexual function data of survey participants is reported in Table S2. It appears that male taxi drivers had a better sexual function compared to their female counterparts, with 62.8% without Erectile Dysfunction vs 29.5% without Female Sexual Dysfunction. Men with sexual dysfunction were older, were on chronic treatment more frequently (47% vs 30% ; $p < 0,05$); presented hypertension more frequently (26% vs 16%; $p < 0,05$), were on LUTS medical treatment more frequently (8%vs1%; $p < 0,05$) and presented more frequently urinary incontinence (10% vs 2%; $p < 0,05$) (Table S3). On multivariate binary logistic regression analysis, risk factors for erectile dysfunction were age older than 50 years (OR = 3.64; $p < 0.05$) and urinary incontinence (OR = 5.53; $p = 0.005$) (Table S4).

In women there was a correlation between sexual dysfunction and chronic pelvic pain ($p = 0.22$;$p < 0.039$). No further analysis were possible due to the low number of events.

DISCUSSION

To the best of our knowledge, this is the first Survey investigating the pattern of LUTS among taxi drivers in an Italian city. Indeed, this study cover a working category which spend many times sitting and driving, in a medium size city of roundabout 400 000 inhabitants, characterized by a strong touristic vocation, with more than 10 million tourists in 2018. The comprehensive effect of all these factors created a particularly unwelcome setting for this work category, which was already exposed to bad urinary habits, and was therefore evaluated by this survey. Overall, we found that the taxi driver work class in Florence was composed mainly by male (83.6%), and mostly were long time drivers with more than 10 years of activity, while only 10% of them had less than 35 years. Indeed, the population characteristics varied between male and female, but both had a third of the population with moderate/severe LUTS according to the reported IPSS, which can be partly explained especially in male with ageing, as it emerges from multivariate analysis, but when compared with literature, Madersbacher et al, report that a third of male after the sixth decade experience such LUTS burden. Therefore, data suggest that long term taxi drivers might have a higher non neurogenic male LUTS burden when compared with same age people[19]. This data become increasingly meaningful when we analyse women, which were indeed younger, but similarly a third of them had moderate/severe LUTS, with a significantly worst IPSS QoL sub-score and a higher rate of recurrent UTIs. Rates founds are thus higher, when compared with the population who underwent urodynamic by Malde et al, they found BOO in 19% of more than a thousand women which were enrolled[20]. Moreover, rate of moderate/severe LUTS was higher in women also when compared to worldwide population data by Irwin[21].

Such differences were not limited to voiding or storage LUTS, but also OAB syndrome rates were definitely higher when compared to worldwide prevalence data in females, with a 23.9% of females affected, compared to a 11% general population data, meanwhile in men were comparable 7.6% in Cab drivers vs 10% in general population[21]. Such problem might be stressed by the taxi drivers urinary bad habits, enhanced by a 12 hour a day working time, with only 2 day off days weekly and only 15 days of holiday yearly due to the established working timetable by the local City administration. Indeed, night workers have higher OAB burden, as reported by De Nunzio et al in 2021[10]. Moreover, higher BMI is

another risk factor for troublesome OAB as confirmed in different studies and as it emerge from our multivariate analysis[22, 23].

Data became interesting when recalled to sexual function, with data found on men which are mostly aligned with literature, with a roughly 38% of ED presence (considering any magnitude) that is comparable to the 30% of males younger than 40 years and a prevalence much higher in elder individuals, furtherly confirmed at our multivariate analysis[24, 25]. However, when we considered women, data were consistently higher, with a 70% of female taxi drivers with sexual dysfunction according to the reported FSFI. Such data, is much more relevant when we consider that from a 40% of general female population, it might rise to 90% in women with cardiovascular risk factors, which are almost absent in our series and are also mainly younger than 50 years[26, 27].

The role of different job and shifts and the risk of LUTS has been recently explored. De Nunzio and co-workers evaluated the risk of LUTS in nightshift workers when compared to traditional workers[10]. According to their results, On OABq-sf, total score, symptoms bother (OABq-SB) and health related quality of life (OABq-HRQL) domains were significantly higher in NSWs group, when compared to traditional workers. The authors concluded that night shifts have an important impact on urinary symptoms and quality of life. As well, a subsequent study evaluated the beneficial effect of vacation on health care workers highlighting a beneficial effect particularly in night-shift workers[12].

Comprehensively, our study rises awareness on the higher risk of LUTS and sexual dysfunction of taxi drivers and the risk factors related to them. Nevertheless, limitations are indeed evident, as this was just a survey, and not a fully outpatient visit, thus data might be furtherly explored in future. Secondly, we focused on a particular category of drivers, taxi drivers, thus results might not be generalisable to other categories. Yet, strength points are also present, as the web-survey had a high response rate, breaking the 60% of response rate, thus giving reliable results, and the anonymous response allowed taxi drivers to respond freely, especially for the more intimate question on sexual function, which indeed gave interesting results.

CONCLUSIONS

According to our web-based survey, Taxi drivers in the metropolitan city of Florence had non-negligible symptomatic LUTS and even sexual dysfunction. Our data suggest as LUTS are influenced by several lifestyle and behavioural factors as type and duration of work. Further study should clarify the possible biological mechanisms and lifestyle changes beyond our findings.

Declarations

Compliance with Ethical Standards

Authors don’t have any conflict of interest to disclose.

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Code availability: Not Applicable.

Authors' contributions

De Nunzio: Protocol/project development, Data collection or management, Data analysis, Manuscript writing/editing

Cicione: Data collection or management, Manuscript writing/editing

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