

Prevalence of urinary incontinence among young female adults

Muhammad Osama, Saman Shaukat, Momnah Javed, Maryam Naeem

Abstract

A cross sectional survey was conducted in 2018-2019 to determine the prevalence of urinary incontinence among university going nulligravid young female adults in Rawalpindi/Islamabad, Pakistan. A total of 608 participants were included in the study via convenience sampling. Data was collected regarding demographic and personal information, in addition to Medical, Epidemiologic, and Social Aspects of Aging (MESA) Urinary Incontinence Questionnaire (UIQ). Independent t-test and One-way ANOVA were used for inter-group comparisons. Pearson and Spearman correlation was used to determine the relationship between variables. The overall prevalence of urinary incontinence was observed to be 193(31.7%) and of stress, urge and mixed incontinence was found to be 64(10.5%), 56(9.2%) and 73(12%) respectively. A significant difference ($p < 0.05$) was observed in terms of MESA-UIQ stress incontinence and urge incontinence scores based on tobacco use, menstrual disorders, eating disorders and marital status.

Keywords: Epidemiology, urinary incontinence, stress incontinence, urge incontinence, young adults, prevalence, nulligravidity.

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Introduction

Urinary incontinence (UI) is a very common and troubling health condition in women, which is observed to have a negative effect on the quality of life, and is also associated with a substantial economic cost.¹⁻⁶ Due to the nature of the problem, this condition usually goes unreported as patients feel a sense of humiliation and embarrassment in discussing such problems with health care professionals, especially in the eastern society and thus remain uninformed of the management options available.^{1,7} For this reason, if we take a look at the review of the literature, the prevalence of urinary incontinence is observed to be lesser in Asia as compared to Europe and America, with prevalence figures ranging from 1.5%-15.2%, 1.8%-30.5%, and 1.7%-36.4% respectively.⁸ Furthermore, the prevalence of UI ranges from 2.8%-57.7% in developing countries, with

a mean prevalence of 25.7%.⁹ The prevalence of UI in Pakistan has been reported to be 11.5%, with stress incontinence being the most prevalent subtype with the figure of 4.7% followed by urge incontinence and mixed incontinence with prevalence figures of 3.2% and 2.8% respectively, with advancing age, early marriages and higher parity being major risk factors.⁷ However, it is imperative to point out that the prevalence figures vary depending on the definitions and assessment techniques used in the research process.⁷ Even though UI is a well-known and acknowledged health concern worldwide post pregnancy and in elderly women, but younger nulliparous and nulligravid women can also experience episodes of UI,¹⁰ however very little emphasis has been paid to this specific part of the population.^{1,11,12} A recent review comprising of 18 studies reported prevalence estimates ranging from 1% to 42.2% in nulliparous adolescent and middle aged women, with obesity, childhood enuresis and high impact sporting activities being the major risk factors.¹ It is also important to point out, that of the 18 studies, 9 were from Europe, 2 were from US, Australia and Brazil, and 1 from Canada, China and Malaysia.¹ There is lack of literature regarding the occurrence of UI among healthy young nulliparous and nulligravid female adults in the Indian subcontinent¹ and for this reason, the purpose of the current study was to determine the prevalence of UI among university going nulligravid young female adults in Rawalpindi and Islamabad, Pakistan.

Subjects and methods

A cross sectional study was conducted in 2018-2019, and data was collected from university going nulligravid young female adults in the region of Rawalpindi and Islamabad, Pakistan. Healthy young nulligravid female adults aged 18 to 26 years were included in the study via convenience sampling. Male students were excluded from the study and females were asked not to fill the questionnaire if they were suffering from any severe health condition including diabetes, kidney, liver or respiratory disease, were or had ever been pregnant, had an acute major illness, had undergone a major surgery or a gynecological surgery in the previous 6 months and/or were diagnosed with or being treated for any sort of cancer. A sample size was of 384 was calculated using Raosoft sample size calculator,¹³ with a confidence interval of 95%, margin of error 5%, response distribution of 50%, and a population size of

Foundation University Institute of Rehabilitation Sciences, Foundation University, Islamabad, Pakistan.

Correspondence: Muhammad Osama. e-mail: osamadpt@gmail.com

605131, consisting of 163689 females aged 18-26 years residing in Islamabad¹⁴ and 441442 females residing in Rawalpindi.¹⁵ A total of 608 participants were included in the study to compensate for risk of missing data and to increase generalizability.

Informed consent was taken from all participants in writing before inclusion in the study and participation in survey was voluntary. Participants were permitted to withdraw at any time during the survey. Ethical approval was acquired from Foundation University Islamabad, Ethical Review Committee (Ref # FF/FUMC/215-3Phy/18) in line with the Declaration of Helsinki.

Data was collected via self-answered questionnaires consisting of demographic and personal information, in addition to Medical, Epidemiologic, and Social Aspects of Aging (MESA) Urinary Incontinence Questionnaire (UIQ), which was used as an outcome measurement tool to quantify the severity of stress and urge incontinence, with proven predictive validity for self-assessment of the severity of urinary incontinence. MESA-UIQ consists of 15 questions, out of which the combined score of questions 1-9 represent stress incontinence and questions 10-15 represent urge incontinence.¹⁶ To determine the prevalence of UI, the presence of UI was defined as a response of "sometimes" or "often" to any one of the questions of the MESA-UIQ.¹⁷ Mixed incontinence was defined as a response of "sometimes" or "often" to at least one of the questions of the MESA-UIQ stress incontinence subscale and at least one of the questions of the MESA-UIQ urge incontinence subscale. The participants that were categorized as mixed incontinence were not categorized as urge or stress incontinence separately to avoid repetition. The questionnaire was comprehensively explained to the participants before they could fill the questionnaire. Data was analyzed using Statistical Package for the Social Sciences (SPSS) v.21.0 and Shapiro Wilk and Kolmogorov Smirnov tests were used for data analysis. Independent t-test was used to compare participants on the basis of marital status and, toilet and tobacco use, and One-way ANOVA was used to compare participants on the basis of menstrual disorders, caffeine

consumption and eating disorders. Pearson and Spearman correlation was used to determine the relationship between variables. Confidence interval was kept at 95% and a p-value of less than 0.05 was considered significant.

Results

The mean age of the participants was 20.68 ± 1.65 years, with a mean weight, height, and body mass index (BMI) of 53.67 ± 8.13 Kg, 5.44 ± 1.95 feet and 20.06 ± 2.94 respectively. The overall prevalence of urinary incontinence among university going nulliparous young female adults was observed to be 193(31.7%). Based upon the type of incontinence, the prevalence of stress incontinence was 64(10.5%), urge incontinence was 56(9.2%) and mixed incontinence was 73(12%). Out of 608 participants, 403(66.3%) participants reported rarely, sometimes, or often for at least one symptom of either stress or urge incontinence, 315(51.8%) participants reported rarely, sometimes, or often for at least one symptom of stress incontinence and 318(52.3%) participants reported rarely, sometimes, or often for at least one symptom of urge incontinence (Table-1).

A significant difference ($p < 0.05$) was observed in terms of stress incontinence and urge incontinence scores based on tobacco use, menstrual disorders and eating disorders, however, in terms of marital status, a significant difference ($p < 0.05$) was only observed in scores of stress incontinence. (Table-2). No significant differences ($p > 0.05$) were observed in terms of weight, height, and BMI between married and unmarried females except for age (< 0.001), with the mean

Table-1: Summary of the symptoms of stress & urge incontinence among young nulliparous female adults.

		Never n (%)	Rarely n (%)	Sometimes n (%)	Often n (%)
Stress Incontinence	Does coughing gently cause you to lose urine?	504 (82.9)	66 (10.9)	34 (5.6)	4 (0.7)
	Does coughing hard cause you to lose urine?	458 (75.3)	105 (17.3)	37 (6.1)	8 (1.3)
	Does sneezing cause you to lose urine?	510 (83.9)	64 (10.5)	27 (4.4)	7 (1.2)
	Does lifting cause you to lose urine?	556 (91.4)	38 (6.3)	10 (1.6)	4 (0.7)
	Does bending cause you to lose urine?	572 (94.1)	25 (4.1)	11 (1.8)	0 (0)
	Does laughing cause you to lose urine?	439 (72.2)	110 (18.1)	50 (8.2)	9 (1.5)
	Does walking briskly/jogging cause you to lose urine?	556 (91.4)	32 (5.3)	18 (3.0)	2 (0.3)
	Does straining when constipated cause you to lose urine?	454 (74.7)	97 (16)	45 (7.4)	12 (2)
	Does getting up from a sitting to a standing position cause you to lose urine?	548 (90.1)	40 (6.6)	19 (3.1)	1 (0.2)
Urge Incontinence	Some people receive very little warning and suddenly find that they are losing, or about to lose, urine beyond their control. How often does this happen to you?	441 (72.5)	120 (19.7)	38 (6.3)	9 (1.5)
	If you can't find a toilet or find a toilet that is occupied and you have an urge to urinate, how often do you end up losing urine and wetting yourself?	475 (78.1)	105 (17.3)	20 (3.3)	8 (1.3)
	Do you lose urine when you suddenly have the feeling that your bladder is very full?	432 (71.1)	124 (20.4)	30 (4.9)	22 (3.6)
	Does washing your hands cause you to lose urine?	560 (92.1)	36 (5.9)	8 (1.3)	4 (0.7)
	Does cold weather cause you to lose urine?	443 (72.9)	107 (17.6)	43 (7.1)	15 (2.5)
	Does drinking cold beverages cause you to lose urine?	482 (79.3)	79 (13)	35 (5.8)	12 (2)

Table-2: Differences in Stress & Urge incontinence scores on the bases of different factors.

Variable		n (%)	MESA-UIQ Score	
			Stress Incontinence	Urge incontinence
Toilet Use	Western	417 (68.6)	2.139±3.345	1.839±2.764
	Indian	191 (31.4)	1.717±2.904	1.8901±2.582
	<i>p</i> -value		0.133	0.830
Tobacco Use	Yes	26 (4.3)	5.692±6.367	4.654±4.088
	No	582 (95.7)	1.842±2.903	1.730±2.562
	<i>p</i> -value		0.005	0.001
Menstrual Disorders	None	388 (63.8)	1.693±2.899	1.448±2.279
	Oligomenorrhoea	55 (9.0)	2.527±4.504	2.473±3.442
	Dysmenorrhoea	94 (15.5)	2.266±3.0096	2.478±3.388
	Polymenorrhoea	44 (7.2)	3.227±3.958	2.795±2.733
	Amenorrhoea	27 (4.4)	2.556±3.297	2.740±2.943
	<i>p</i> -value		0.012	<0.001
Eating Disorders	None	244 (40.1)	1.283±2.225	1.201±2.013
	Anorexia Nervosa	140 (23)	2.093±3.722	1.928±2.668
	Bulimia Nervosa	53 (8.7)	2.434±3.467	2.679±3.173
	Binge Eating	171 (28.1)	2.836±3.653	2.473±2.1998
	<i>p</i> -value		<0.001	<0.001
Caffeine Consumption	<1 times a day	174 (28.6)	2.414±3.774	1.856±2.439
	1 time a day	154 (25.3)	1.500±2.567	1.636±2.722
	2 times a day	205 (33.7)	2.020±3.099	1.9122±2.808
	3 times a day or greater	75 (12.3)	2.067±3.244	2.147±2.985
	<i>p</i> -value		0.084	0.580
Marital Status	Single	595 (97.9)	1.956±3.09	1.828±2.682
	Married	13 (2.1)	4.308±6.688	3.077±3.569
	<i>p</i> -value		0.009	0.100

age of 20.64±1.616 and 20.64±1.616 years for unmarried and married females respectively. No significant differences ($p>0.05$) were observed in terms of age, height, and BMI on the basis of tobacco use except for weight (0.001), with the mean weight of 58.69±9.76 and 53.45±7.98 kg for tobacco users and non-users respectively. No significant differences

($p>0.05$) were observed in terms of age, weight, height, and BMI on the basis of menstrual disorders. Significant differences ($p<0.05$) were observed in terms of weight, height, and BMI on the basis of eating disorders except for age in which no significant differences were observed ($p>0.05$).

No significant correlations ($p>0.05$) of age, weight, height or BMI were observed with stress or urge incontinence. However, a significant positive correlation ($r=+0.549$, $p<0.001$) was observed between stress and urge incontinence.

Discussion

The purpose of the current study was to determine the prevalence of urinary incontinence among university going nulliparous young female adults in Rawalpindi/Islamabad, Pakistan, and the overall prevalence of UI was observed to be 193(31.7%). Furthermore, the prevalence of stress incontinence was found to be 137(10.5%), urge incontinence was 129(9.2%) and mixed incontinence was observed to be 173(12%). In comparison to the findings of the current study, the prevalence of urinary incontinence among nulliparous young female adults was observed to be 5.4%-38.6% in Sweden, 32% in Canada and Iceland, 1% in China, 42.2% in United States, 20.7%-22.9% in Brazil, 34.9% in Malaysia, 14% in Denmark, 10.6-13.2% in Australia,

Table-3: Summary of the literature regarding the prevalence of urinary incontinence among nulliparous female adults.

Study	Year of Publication	Country	Age (years)	n	Prevalence of UI (Percentage)			
					Total	SI	UI	MI
Current study		Pakistan	20.68±1.65	608	31.7%	10.5%	9.2%	12%
Häggglund et al ²⁵	1999	Sweden	18-30	335	5.4%	-	-	-
Alnaif&Drutz ²⁶	2001	Canada	15-19	229	32%	-	-	-
Geirsson et al ²⁷	2003	Iceland	16-19	294	32%	17.6%	7.68%	6.72%
Eliasson et al ²⁸	2004	Sweden	28 (17-43)	725	38.6%	-	-	-
Stones RW et al ²⁹	2006	China	21.7±2.4 (15-34)	200	1%	-	-	-
Dockter et al ³⁰	2008	United States	16.2±0.75 (15-18)	90	42.2%	-	-	-
Santos et al ³¹	2009	Brazil	21.4±1.7 (19-26)	58	20.7%	10.4%	8.6%	1.7%
Brown et al ³²	2010	Australia	18-50	1507	10.8%	4.0%	3.3%	3.5%
Zalina et al ¹²	2011	Malaysia	21.4 (18-29)	146	34.9%	23.3%	11.6%	-
Hansen et al ³³	2012	Denmark	26.4±5.2	1836	14%	7.4%	4.5%	2.1%
O'halloran T et al ⁵	2012	Australia	22.5±3.2 (16-30)	1018	12.5% (Students 13.2%; non-students 10.6%)	6.2%	4.5%	1.9%
Bardino M et al ¹⁹	2015	Italy	21±2.3 (15-25)	1936	12.4%	7.2%	3.4%	1.9%
Van Breda et al ³⁴	2015	Netherlands	18-30	159	20.1%	-	-	-
Da Roza et al ³⁵	2015	Portugal	21.4±3.3 (14-33)	386	19.9%	9.8%	4.4%	5.7%
Alves JO et al ¹⁰	2017	Brazil	18-40	245	22.9%	13.9%	6.1%	2.9%
Daly D et al ¹⁸	2018	Ireland	18-40	860	34.8%	9.7%	12.5%	12.6%

12.4% in Italy, 20.1% in Netherlands, 19.9% in Portugal and 34.8% in Ireland respectively (Table-3). However, it is imperative to point out that the prevalence figures vary depending on the definitions and assessment techniques used in the research process.⁷

The most common subtype of urinary incontinence observed in the literature was stress incontinence with its prevalence ranging from 4.0%-23.3% (Table-3). In the current study however, mixed incontinence was observed to be the most common subtype of UI, in accordance with the findings of Daly D et al.¹⁸ A significant difference ($p<0.05$) was observed in terms of MESA-UIQ stress incontinence and urge incontinence scores based on tobacco use, menstrual disorders, eating disorders and marital status. Pre-existing evidence has shown age less than 19 years, BMI greater than 30 kgm², existing history of constipation, childhood enuresis especially after the age of 5 years,¹⁹ positive history of psychological disorders and depression²⁰ to be linked with the occurrence of UI in young women. No significant relationship of weight and BMI has been observed with the occurrence of UI among young women in the current study. However, the literature shows contradictory findings regarding the relationship of obesity with the occurrence of UI, with some studies reporting obesity as a risk factor²¹ and some not.²² Nulliparous women are less likely to have urinary incontinence as compared to parous women²³ and a study conducted in Pakistan found out a positive association between gravida and urinary incontinence.²⁴

In summary of the pre-existing literature and the findings of the current study, it can be concluded that the prevalence of urinary incontinence is notable among nulliparous healthy young adults which is a subset of the population that was previously not given much attention and it is suggested that perhaps addressing this condition at this stage of life would result in a lower prevalence figure among women in the later stages of life.

Limitations: Inquiring about being sexually active or not is a sensitive matter in the Pakistani society and for that reason the participants were only inquired regarding their marital status. However, being sexually active may or may not play a role in the occurrence of urinary incontinence which the current study was not able to explore. A considerable part of nulligravid young female adult population doesn't seek university education and thus was not included in the current study. The use of MESA-UIQ in English was not justifiable for uneducated population and thus was not targetted in this study which also forms a considerable part of nulligravid young female adult population in Pakistan. It is recommended that cultural

adaptation and Urdu translation of questionnaires should be carried out and larger studies should be conducted on community dwelling young females to target the above-mentioned uneducated subsets of the population.

Conclusion

The overall prevalence of urinary incontinence is observed to be 193(31.7%) and of stress, urge and mixed incontinence was found to be 64(10.5%) and 56(9.2%) and 173(12%) respectively. Being married, use of tobacco products, eating disorders and menstrual disorders can increase the risk of urinary incontinence.

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