

## PREVALENCE AND RISK FACTORS OF URINARY INCONTINENCE IN TURKISH NURSING HOMES: A CROSS-SECTIONAL STUDY

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### Abstract

**Objectives:** To investigate the prevalence and risk factors of urinary incontinence (UI) in nursing home residents in the capital city of Turkey.

**Methodology:** In this cross-sectional study, 394 elderly people (244 women and 150 men), aged over 60 years were interviewed in nursing homes. A structured questionnaire and face to face interviews were used as the instrument for data collection.

**Results:** The overall prevalence of UI was 22.8% (n=90) when defined as "the involuntary loss of urine at least twice a month". Among elderly people, 33 (36.3%) had urge, 29 (31.9%) stress and 5 (5.5%) mixed type UI. UI was significantly associated with body mass index, recurrent lower urinary tract infections, heart disease, endocrine disorders, respiratory diseases and urinary system diseases.

**Conclusions:** Urinary incontinence affects approximately one of four elderly people in Turkish nursing homes. The results underscore the need for planning prevention and treatment strategies for UI.

**KEY WORDS:** Urinary incontinence, Elderly, Prevalence, Risk factors, Nursing Home.

Pak J Med Sci January - March 2009 Vol. 25 No. 1 18-25

### How to cite this article:

Kocaöz S, Bilgili N, Eroglu K. Prevalence and risk factors of urinary incontinence in Turkish Nursing Homes: A cross-sectional study. Pak J Med Sci 2009;25(1):18-25.

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- \* Received for Publication: March 31, 2008
- \* Revision Received: April 12, 2008
- \* Revision Accepted: January 8, 2009

## INTRODUCTION

Urinary incontinence (UI) is a common health problem in elderly people, because of essential functional impairments and convergent medical diseases.<sup>1,2</sup> Several studies have researched the prevalence of UI in the community and nursing homes.<sup>1,3-6</sup> Estimates of prevalence of UI vary widely, due to differences in definitions, methods and populations.<sup>7-9,10</sup> The prevalence rates of UI in elderly vary between 17-55% in women and 11-34% in men as reported by 21 studies.<sup>11</sup> UI causes suffering among 20-30% of elderly people living in the community and approximately 50% those in long-term care institutions.<sup>12-14</sup>

UI, although not life-threatening, can lead to many physical problems ranging from skin

irritation to urinary infections and can also cause economical and psychological problems and a limitation of the person's lifestyle.<sup>15-18</sup> However, many people with incontinence do not seek a solution to their problem.<sup>19,20</sup>

Arikan et al.,<sup>21</sup> established that 30% of elderly women living in nursing homes were incontinent while Aslan et al.,<sup>22</sup> reported a prevalence rate of 25% in elderly. Both these studies in Turkish nursing homes have reported much lower incidences than studies from the USA or other European countries. This reason can be attributed to the difference in acceptance criteria.<sup>24</sup> Nursing homes in Turkey accept people over 60 years old who do not have any condition that prevent them from looking after themselves and who can independently carry out daily activities, who is stable mentally, has no contagious disease, is not dependent on narcotics or alcohol and who can prove they are socially and/or economically in need with a social analysis report.<sup>24</sup> The elderly traditionally do not prefer nursing homes in Turkey and are looked after in their children's home.

A limited number of studies have been carried out in Turkey on the prevalence of urinary incontinence in the elderly and associated factors; especially in individuals living in nursing homes.<sup>21-23</sup> The aim of the present study was to investigate the prevalence and risk factors of urinary incontinence (UI) in nursing home residents in the capital city of Turkey. We thought that the results obtained from our study could help the planning of care services that the elderly might need in relation to urinary incontinence.

## METHODOLOGY

*Study Design:* A cross-sectional study was conducted in four big state nursing homes in the Ankara city center between March 2004 and May 2005. All elderly people gave informed consent to participate and the Ethical Committee of the Institution has approved the study protocol. Four hundred and ninety six elderly individuals living in nursing homes and who were not bed-ridden and did not have demen-

tia or any disease affecting consciousness and perception constituted the study universe. Instead of selecting a sample group, we aimed to reach all the elderly people residing in nursing homes. However, those individuals who decided not to join the study, who could not be contacted or who had problems in understanding the questions were excluded and the study was completed with 394 elderly people. The response rate was 79%.

Data were collected by a questionnaire developed by the investigators. A questionnaire that contained questions related to incontinence and the influencing factors were prepared to define the demographic data. The questionnaire was composed of three parts. The first part was intended to investigate socio-demographic characteristics of the elderly such as age, height, weight, education and social security status. The second part was planned to investigate the presence, frequency and type of urinary incontinence and whether pads or diapers were used. The duration of incontinence and previous and current help-seeking status were asked. The aim of third part was to determine medical and obstetrics history related to risk factors thought to cause urinary incontinence.

The questionnaire used as the data source in the study was applied to the elderly people through a face to face technique. The administration of the questionnaire lasted an average of 30 minutes. Since nursing home records are inadequate in our country, elderly people was asked to answer "yes" or "no" as to whether they experienced UI. Urinary incontinence was defined as the involuntary loss of urine occurring at least twice a month. The urinary incontinence diagnoses were divided into groups such as stress urinary incontinence, urge incontinence, mixed incontinence, overflow incontinence and other incontinence types (e.g. functional, psychological, enuresis, bypass UI).

Measurements of height and weight were used to calculate body mass index (BMI) ( $\text{kg}/\text{m}^2$ ). BMI was classified as weak ( $16-19\text{kg}/\text{m}^2$ ), normal ( $20-24, 9\text{kg}/\text{m}^2$ ), slightly obese ( $25-29, 9\text{kg}/\text{m}^2$ ) and obese ( $30-39, 9\text{kg}/\text{m}^2$ ).

*Statistical Analysis:* The data form of the questionnaire was analyzed using the Statistical Package for Social Sciences (SPSS) for Windows (Version 10.0). Associations between categorical variables were assessed by frequency test, Chi-Square and Fischer's Chi-Square tests. The presence of urinary incontinence was accepted as the dependent variable, and the specifications belonging to the socio-demographic and risk factors, which can affect the development of the incontinence, were taken as the independent variables in our research. In order to evaluate the relation between the dependent and independent variables, the Pearson Chi-Square and Fischer's Chi-Square tests were used. A p level of <0.05 was considered statistically significant. "Backward Stepwise Regression Analysis" was

conducted on the individuals who took part in the research to see the effects of the risk factors that were detected to have a significant association with urinary incontinence.

## RESULTS

When the socio-demographic characteristics of the individuals taking part in the research were taken into consideration, it was seen that 50.8% of the women and 52.7% of the men were in the 75-78 age group, 39.8% of the women were slightly obese (25-29.9kg/m<sup>2</sup>) and 20.5% were obese (30-39.9kg/m<sup>2</sup> and above), while 30% of the men were slightly obese and 11.3% were obese by BMI. While 27.9% of the women had primary and 43.8% had secondary and higher education, 32.7% of the men

Table-I: Distribution of Urinary Incontinence Symptoms According to Gender in Nursing Home Residents

<i>Urinary Incontinence (UI) Symptoms</i>	<i>Gender</i>					
	<i>Female</i>		<i>Male</i>		<i>Total</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Presence of UI	n=244		n=150		n=394	
Yes	61	25.0	29	19.3	90	22.8
No	183	75.0	121	80.7	304	77.2
Frequency of Symptoms	n=61		n=29		n=90	
At least twice a month	23	37.7	16	55.2	39	43.3
Several times a week	12	19.7	7	24.1	19	21.1
Several times a day	20	32.8	4	13.8	24	26.7
Continuous	6	9.8	2	6.9	8	8.9
Duration of Symptoms	n=61		n=29		n=90	
Less than 6 months	6	9.8	4	13.8	10	11.1
6-12 months	3	4.9	2	6.9	5	5.6
13-36 months	19	31.2	8	27.6	27	30.0
37 months or more	26	42.6	13	44.8	39	43.3
Unknown	7	11.5	2	6.9	9	10.0
Type of UI <sup>1</sup>	n=61		n=29		n=90 <sup>1</sup>	
SUI	25	41.0	4	13.8	29	32.2
Urge	21	34.4	12	41.4	33	36.6
Mixed	5	8.2	–	–	5	5.6
Overflow	3	4.9	2	6.9	5	5.6
Other <sup>2</sup>	7	11.5	11	37.9	18	20.0

<sup>1</sup>n was multiplied as one subject gave more than one answer to one question. The percentages were calculated using n.

<sup>2</sup>Persons with multiple diagnoses, psychological and neurological conditions and incontinence types where the cause is not definitely known.

had primary and 49.3% had secondary and higher education. It was found that a majority of the men and women had social security.

The overall prevalence of urinary incontinence was found to be 22.8% (Table-I). We determined that one out of every four women (25%) and one out of every 5 men (19.3%) had urinary incontinence. While 37.7% of the women expressed that they experienced incontinence at least twice a month and 32.8% of them a few times a day, 55.2% of the men expressed that they suffered from incontinence at least twice a month. 42.6% of the women and 44.8% of the men had experienced incontinence problems for four years or longer. In our study, 32.2% of nursing home residents had stress, 36.6% had urge and 5.6% had mixed urinary incontinence. It was found that more than half of the women (55.7%) and 10.3% of the men used pads or diapers because of UI. 42.6% of the women and 51.7% of the men consulted a physician because of urinary incontinence but only half of the individuals with problems were cured in either group (F: 50%, M: 51.7%).

When the distribution of urinary incontinence in relation to pregnancy and child-bearing status was taken into consideration in the women taking part in the study, it was established that 28.3% of the women had never been pregnant, 11.1% had been pregnant once and 58.2% four or more times. 26.3% of the women had aborted and 22.9% had undergone a D&C. The percentage that had never given birth was 29.9%, while 12.3% had given birth once and 26.2% 4 or more times. Vaginal delivery rate was 96.4%, prolonged and difficult labor had been present in 37.4%, an episiotomy had been required in 24%, vacuum or forceps were used in 5.8%, vaginally delivery was seen in 7%, a baby birth weight of 4 kg or more was present in 18.1% and twins in 4.7%. The relation between urinary incontinence and number of pregnancies, number of births, spontaneous abortion status, being curettage status, status of having prolonged and difficult labor and the presence of an episiotomy was found to be statistically insignificant ( $p>0.05$ ).

The relation between urinary incontinence and undergoing a hysterectomy was found to be statistically insignificant ( $p>0.05$ ). During the study, 32% of the men had prostate problems and 21.3% had been operated on for this reason. The relation between urinary incontinence and having prostate trouble and or having undergone a prostatectomy operation in men was found to be statistically insignificant ( $p>0.05$ ).

Prevalence rate of urinary incontinence according to some risk factors in nursing home residents can be observed in Table-II. While the relation between urinary incontinence and constipation, recurrent lower urinary tract infection history, and body mass index was found to be statistically significant ( $p<0.05$ ), that between urinary incontinence and persistent cough complaint, smoking, and age and sex group was insignificant ( $p>0.05$ ).

The relation between urinary incontinence and heart disease (F: 24.2%, M:24%), endocrine disorders (F:20.9%, M:17.3%), respiratory disease (F:11.1%, M:15.3%) and urinary system disease (renal disease, bladder stone, lower urinary tract infections, etc.) (F:6.1%, M:14%) was statistically significant ( $p<0.05$ ), while the relation with hypertension (F:60.7%, M:43.3%), depression (F:6%, M:4.7%), allergy (F:7%, M:4%) and having gastrointestinal system disease (F:24.2%, M:20.7%) was statistically insignificant ( $p>0.05$ ).

The "Backward Stepwise Regression Analysis" was conducted to see the effects of constipation, recurrent lower urinary tract infection, body mass index, heart disease, endocrine disorders, respiratory diseases and urinary system diseases, determined to have a significant relation with urinary incontinence, together (Table-III). According to the result of the analysis, it was determined that being constipated increased the risk of urinary incontinence development, but did not affect it directly unlike other factors ( $p=0.110$ ).

## DISCUSSION

The prevalence of urinary incontinence in nursing home residents is reported to be more

Table-II: Prevalence rate of Urinary Incontinence according to some risk factors in Nursing Home Residents

Risk Factors Related Data	Incontinent		Continent		Total		x <sup>2</sup>	p
	n	%	n	%	n	%		
<i>Constipation Status</i>								
Yes	43	28.1	110	71.9	153	100.0	3.390	0.047
No	47	19.5	194	80.5	241	100.0		
<i>Persistent Cough Complaint</i>								
Yes	17	27.4	45	72.6	62	100.0	0.874	0.350
No	73	22.0	259	78.0	332	100.0		
<i>Smoking Status</i>								
Smoker	11	14.7	64	85.3	75	100.0	4.173	0.124
Nonsmoker	55	23.6	178	76.4	233	100.0		
Past Smoker	24	27.9	62	72.1	86	100.0		
<i>Recurrent Lower Urinary History<sup>1</sup></i>								
Yes	34	40.0	51	60.0	85	100.0		
No	56	18.1	253	81.9	309	100.0		
<i>Bladder or Urinary Stone Status</i>								
Yes	7	41.2	10	58.8	17	100.0	2.388	0.122 <sup>3</sup>
No	83	22.0	294	78.0	377	100.0		
<i>Back Surgery History Status</i>								
Yes	3	17.6	14	82.4	17	100.0	–	0.772 <sup>2</sup>
No	87	23.1	290	76.9	377	100.0		
<i>Childhood Enuresis Status</i>								
Yes	7	46.7	8	53.3	15	100.0	5.706	0.058 <sup>4</sup>
No	80	21.6	290	78.4	370	100.0		
Unknown	3	33.3	6	66.7	9	100.0		
<i>Body Mass Index</i>								
16-19 kg/m <sup>2</sup>	5	19.2	21	80.8	26	100.0	12.844	0.005
20-24,9 kg/m <sup>2</sup>	24	15.1	135	84.9	159	100.0		
25-29,9 kg/m <sup>2</sup>	37	26.1	105	73.9	142	100.0		
30-39,9 kg/m <sup>2</sup> or more	24	35.8	43	64.2	67	100.0		
<i>Gender</i>								
Female	61	25.0	183	75.0	244	100.0	1.692	0.193
Male	29	19.3	121	80.7	150	100.0		
<i>Age Groups</i>								
65 or less	3	11.1	24	88.9	27	100.0	5.518	0.138
65-74 years	21	17.9	96	82.1	117	100.0		
75-84 years	54	26.6	149	73.4	203	100.0		
85 or more	12	25.5	35	74.5	47	100.0		

<sup>1</sup>One participant stated being unaware of past urinary infection. This patient was evaluated in the no urinary tract infection group.

<sup>2</sup>Fisher's Exact Test was used for statistical evaluation.

<sup>3</sup>Where 2X2 tables were used; Yates' Continuity Correction was applied to compensate for the over-estimation in the X<sup>2</sup> value.

<sup>4</sup>As the ratio of the expected frequency to over all exceeded 20%, the value of chi square was not interpreted.

Table-III: Risk Factors of UI According to Backward Stepwise Regression Analysis (At Last Step)

Risk Factors of UI	B	SE	p	OR	95% CI	
					Lower	Upper
Body Mass Index	-0.392	0.155	0.012	0.676	0.498	0.917
Recurrent Lower Urinary Tract Infection	1.114	0.285	0.0001	3.007	1.721	5.254
Heart Disease	-0.836	0.339	0.014	0.434	0.223	0.842
Endocrine Disorders	0.714	0.302	0.018	2.043	1.131	3.690
Respiratory Diseases	0.766	0.357	0.032	2.151	1.069	4.327
Urinary System Diseases	0.932	0.392	0.017	2.539	1.179	5.471

than 50%.<sup>5,6,11</sup> We found a urinary incontinence prevalence of 22.8%. The urinary incontinence prevalence was reported as 54.5% in a study by Aggazotti et al.,<sup>5</sup> and 47.9% by Coppola et al.<sup>25</sup> In our study urinary incontinence prevalence is consistent with data from our country by Arikan et al.,<sup>22</sup> (30%), Aslan et al.,<sup>23</sup> (25%), but lower than the rate reported by studies from other countries and is similar to the urinary incontinence rate in the general elderly population (20-30%).<sup>5,25,26</sup> In our study urinary incontinence prevalence may be lower because of insufficient data in the records of the nursing homes and simply of relying on the statements of the individuals for this reason. Many elderly individuals are ashamed of expressing their UI problem or do not consider it as a health problem, since they consider it as a natural result of getting older.<sup>5</sup> The fact that most elderly live with their families in our country and the selective approach used by institutions regarding the elderly that need physical care (those that are unable to take care of themselves, those with dementia, etc. are excluded) may also have led to a lower prevalence of incontinence.

Other studies have found that individuals with higher body mass indexes have a higher rate of urinary incontinence.<sup>5,18,27,28</sup> Dwyer et al.,<sup>28</sup> found that the weights of the female patients with detrusor instability and stress urinary incontinence were 20% higher than other women at their age and height, Shakhathreh et al.,<sup>18</sup> has also found a significant association between BMI and urge incontinence. Espino et al.,<sup>26</sup> have stated that the BMI is a risk factor for incontinence. Similar results have been

obtained in the Nelson and Furner's study.<sup>29</sup> Likewise, we found a statistically significant relation ( $p < 0.05$ ) between BMI and urinary incontinence.

Some studies suggest that the chronic constipation can lead to disorders in the pelvic muscle functions, causing tension in the pudental nerve and thus bringing about incontinence.<sup>16</sup> We found a significant relation ( $p < 0.05$ ) between constipation and urinary incontinence. Similar results have also been obtained in other studies.<sup>5,22</sup>

Urinary system infections and diseases are important risk factors for UI. In addition, frequently seen endocrine disorders such as diabetes also lead to UI development. Diabetes, kidney stones, long-term and temporary catheterization, and urinary system structure and disorders can cause heavy and recurrent infections. The mucosal inflammation created by the infection causes the urinary bladder muscle to tighten and develop urethral sphincter insufficiency due to the alpha-adrenergic effects of the endotoxin secreted by the infection agents.<sup>16</sup> We found a very strong relation ( $p < 0.05$ ) between urinary incontinence and the status of having a recurrent lower urinary tract infection (OR: 3.007, 95% CI 1.721-5.254), status of having urinary system disease (OR: 2.539, 95% CI 1.179-5.471), respiratory disease (OR: 2.151, 95% CI 1.069-4.327), and endocrine system disease endocrine disorders (OR: 2.043, 95% CI 1.131-3.690). The results that we obtained are also in accordance with data from other studies.<sup>5,18,22,26,30</sup>

It is stated that heart failure and acute/chronic diseases, common health problems in

the elderly, will cause urinary incontinence.<sup>16,28</sup> We also found a statistically significant relation between heart disease (OR: 0.434, 95% CI 0.223-0.842) and urinary incontinence in study.

In our study, the significant relationships between the urinary incontinence and the number of pregnancies, spontaneous abortion status, curettage status, status of having long and difficult labor period and episiotomy during delivery was not found ( $p>0.05$ ).

Urinary incontinence which causes physical, social and economic discomfort, affects the life quality and is frequently seen in the elderly population, stands out as an important problem confronting us. The prevalence of urinary incontinence was lower in our study in comparison to other studies from nursing homes but we assume that this rate is actually higher. A record keeping system should therefore be established for determining the urinary incontinence in the elderly living in these institutions and larger studies should be conducted. In addition, we also believe that the emphasis placed by health personnel on this subject should be increased and they should be made aware of the treatment methods including medical treatments. Studies increasing the society's awareness of the risks posed by urinary system infections should be performed. We believe it will be helpful to determine the prevalence and risk factors when planning healthcare such as treatment and monitoring that may be required regarding urinary incontinence in nursing homes.

#### ACKNOWLEDGEMENTS

The authors wish to thank all those who kindly responded to the questionnaires, thus, making the study possible.

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