

## Frequency of Urinary Incontinence among Female Athletes of Karachi

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### ABSTRACT

**Background:** Urinary incontinence is not only a beleaguering problem of older adult males and females but literature reveals that it is a problem for younger adults too. To the best of our knowledge, no research has been conducted in Pakistan to find out the prevalence of urinary incontinence among female athletes. Therefore, this study is conducted to find out its prevalence for the awareness of UI among female athletes, coaches, and sports physiotherapists.

**Objective:** To investigate the frequency of urinary incontinence among female athletes of Karachi

**Methodology:** A cross-sectional study to measure the prevalence of Urinary Incontinence (UI) among female athletes of Karachi. Non-probability purposive sampling technique is used. Recruitment was done from all female athletes of Karachi sports complexes including the National Coaching Centre-Pakistan Sports Board, Womens' complex, Naval Academy, The Physical Institute, Sindh Sports Board, and the Dow University of Health Sciences-Sports Complex. The duration of the study was from September 2017 to February 2018. Participants were enrolled from various sports academies of Karachi. A self-administered questionnaire was the mode of investigation.

**Results:** Total 373 female athletes were included in study. UI was experienced at least once by 242 (64.9%) athletes, while 131 (35.1%) had not experienced it. Out of this percentage, 12.1% had stress incontinence, 36.7% urge incontinence, and 16.1% had mixed incontinence.

**Conclusion:** UI frequency among athletes was found to be 64.9% which shows that UI among female athletes is a public health issue.

**Key words:** Stress incontinence, athletes, physical therapy

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شہر کراچی کی خواتین کھلاڑیوں میں پیشاب پر قابو نہ ہونے کی شکایت کا جائزہ مقصد: اس تحقیق کا مقصد کراچی کی خواتین کھلاڑیوں میں پیشاب پر قابو نہ ہونے کی شکایات کو جانچنا ہے طریقہ کار: ستمبر 2017 سے فروری 2018 کے دوران کراچی کے مختلف کھیلوں کے ادارے بشمول نیشنل کوچنگ سینٹر، ویمن کمپلیکس، نوال اکیڈمی، دی فزیکل انسٹیٹیوٹ، سندھ اسپورٹس بورڈ اور ڈی یو ایچ ایس اسپورٹس کمپلیکس کی خواتین کھلاڑیوں کو تحقیق میں شامل کیا گیا۔ تحقیق کے لیے ایک سوالنامہ پر کروایا گیا۔ جس کی مدد سے کراچی کی خواتین کھلاڑیوں میں پیشاب پر قابو نہ ہونے کی شکایت کا جائزہ لیا گیا۔ نتیجہ: تحقیق میں مجموعی طور پر 373 خواتین کھلاڑیوں کو شامل کیا گیا جن میں سے 242 یعنی 64.9 فیصد خواتین کھلاڑیوں کو پیشاب پر قابو نہ ہونے کی شکایت کم از کم ایک بار ہوئی جبکہ 131 کو یعنی 35.1 فیصد کو یہ شکایت کبھی نہیں ہوئی۔ انہیں خواتین میں سے 12.6 فیصد کو ذہنی دباؤ، 36.7 فیصد کو urge incontinence اور 16.1 فیصد کو ان تمام ہی وجوہات کی بنا پر پیشاب پر قابو نہ پاسنے کی شکایات تھیں۔ حاصل مطالعہ: خواتین کھلاڑیوں میں پیشاب پر قابو نہ پانے کی شکایت ایک عوامی صحت کا مسئلہ ہے۔

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### INTRODUCTION

International continence society gives the definition of urinary incontinence (UI) as an involuntary loss of urine<sup>1</sup>. It is not a fatal condition but it has great psychological effects. Leakage of urine can be

comprehended by knowing its prevalence, severity, aggravating factor, impacts on social life and on the quality of life, and the preventive measures taken by a person<sup>2</sup>.

UI can be classified into three types i.e. stress, urge, and mixed incontinence<sup>3</sup>. Sir Eardley Holland has expressed that stress incontinence is also known as exertional, orthostatic alternately diurnal incontinence<sup>4</sup>. Prevalence of stress urinary incontinence (SUI) is the highest compared to urge and mixed incontinence and a research reveals that its incidence increases in the 5<sup>th</sup> decade of life<sup>5</sup>.

SUI is the involuntary leakage of urine during exertion since the intra-abdominal pressure is raised during the exertion and this elevated pressure cannot be resisted by the urethral sphincter, thus leads to urine leakage during day-to-day activities such as laughing, jumping, lifting, sneezing, etc.<sup>1</sup>. There are various considerable factors for SUI including aging, obesity, increase in BMI, and smoking. However, the impact of pregnancy and childbirth/parity is a conflicting cause<sup>6</sup>. There is a significant impact of SUI on psychosocial life of person and on the quality of life which further on leads to segregation from the society<sup>7</sup>.

Globally, urinary incontinence is more common in females as compared to males, due to their anatomical and physiological body differences. Prevalence of UI among females is 20% to 50%<sup>8</sup> while in men its prevalence is only 3% to 11%<sup>9</sup>. UI is not just a problem of older adult females but also a disturbing condition affecting young and middle-aged females too. Onset of UI is the most common in middle and late adulthood but now it is getting common in early adult females too<sup>4</sup>. Whilst many researchers have found an association between UI with increase in age and BMI, childbirth and mode of deliveries, hysterectomy, heart disease, asthma, arthritis/rheumatoid arthritis, and level of physical activities and sports<sup>10-13</sup>.

Though nearly all women and many healthcare professionals consider absolute UI as a normal, however evidence suggests that UI during stressful physical activity is common among young physically active women even in the absence of known risk factors for incontinence<sup>14</sup>.

Researchers suggest that this condition is not openly discussed by athletes and they remain hesitant to be examined by experts<sup>1</sup>. A research pertaining to this topic in South Africa suggests that the majority of women with urinary incontinence (86.9%) did not consult anyone for this problem. Therefore, athletes

with UI manifestations utilize their own methodologies, and try to adjust their problem according to their strategies such as wearing absorbent pads, preventative urination, and avoidance of fluid intake. However, they do not usually look for medicines, proficient exhortation, or doctor suggestion. As a result, many of the athletes quit their sports activities<sup>2</sup>.

The reported hesitation of athletes and treatment by their own methodologies has highlighted the need for more attention to be given to this problem and more information concerning women's behaviors toward incontinence should be collected by healthcare providers. More research is needed to find out the prevalence of UI among athletes while participating in their sports activities and to increase awareness of UI among them and to design interventions. Therefore, present study is aimed at investigating the prevalence of an under reported and embarrassing condition i.e. urinary incontinence among female athletes of Karachi as to the best of our knowledge no research has been conducted in this domain.

## METHODOLOGY

An observational cross-sectional study design was undertaken for this research, September 2017 till February 2018 to evaluate the prevalence of UI among female athletes of Karachi. Participants were included from all the six districts of Karachi and data was collected from sports complexes including the National Coaching Centre-PSB, Women Complex, Naval Academy, The Physical Institute, Sindh Sports Board, and DUHS-Sports Complex.

Sample size of 373 was calculated through Open Epi version 3.0. The non-probability convenience sampling technique was used.

A self-administered questionnaire was the mode of information about the participants, distributed among those who fulfilled the following inclusion criteria.

### **Selection Criteria:**

#### **Inclusion Criteria:**

18–30 years, female athletes of Karachi

#### **Exclusion Criteria:**

Diagnosed UI pregnant females athletes with other co-morbidities related to bladder and urinary tract system

The female athletes, who met the inclusion criteria, were asked to fill an informed consent form and then self-generated questionnaires were distributed to them.

All collected data was kept confidential.

The questionnaire included close-ended questions in three parts. Part A included demographics, and menstrual history, suggestive past medical history; part B included questions related to sports activity, involving the time duration of physical activity, drugs intake, and addictions; and part C included the questions related to urinary incontinence that if the athlete was found to have urinary incontinence, would she consider it as a problem, what are the preventive measures she may have been taking, and whether she thinks that physical therapy would be a better option of treatment. Collected data was entered and analyzed by SPSS (Statistical Package for Social Sciences) version 23. Chi-square Test is used to check the association of factors causing urinary incontinence among female athletes, P value less than 0.05 was considered as a level of significance.

## RESULT

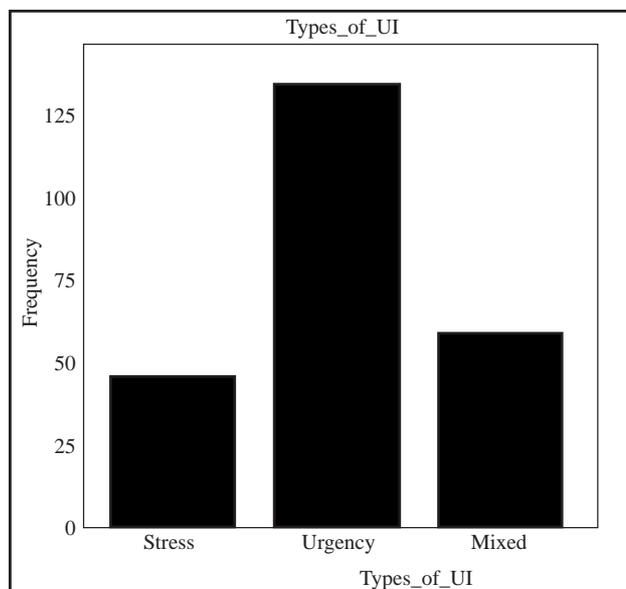
Total 373 female athletes were included in our study. UI was experienced at least once by 242 (64.9%) athletes while 131 (35.1%) had not experienced it. The mean age was alike irrespective of the sport in which they were involved. The list of sports in which they were involved were 25 (6.7%) practicing athletes, 32 (8.6%) basketball, 32 (8.6%) volleyball, 63 (16.9%) badminton, 44 (11.8%) swimming, 21 (5.6%) table tennis, 1 (3%) tai-chi, 75 (20.1%) cricket, 24 (6.4%) indoor football, 2 (5%) throwball, 31 (8.3%) were involved in all type of sports and 23 (6.2%) were involved in some others sports.

Players who experienced UI had lower BMI.

(P=0.11) which is non-significant.(Table 1)

**Table 1:** Showing the significance and association among the various factors related to incontinence

	Value	p-value
Relationship Status	34.837	<0.01*
Hours of Exercise Per Week	4.777	.092
Periods Delaying Drugs	2.549	.110
Play During Menstruation	1.093	.296
Constipation	13.629	<0.01*
Think Abdomen Exercises Have a Role in UI	32.947	<0.01*
Diabetes	.230	.631
Hypertension	.550	.459
BMI	6.011	.111
Sports Activity Involves	17.601	.091
Practicing Duration	28.169	<0.01*
Menstruation Cycle	2.733	.098
Alcohol	1.088	.297
Doing Abdomen Exercises	43.402	<0.01*



**Graph 1:** Graphical Representation of Frequency and Types of UI

Regarding the duration of practice, majority were practicing for less than or equal to five years (46.1%) while the least number (9.7%) were seen to be practicing for more than eight years. Less than or equal to one and eight years were 25.2% and 19% consecutively. Majority of athletes did not smoke (n=370; 99.2%) and (n=223; 59.8%) were single. More than half of the population did not present with constipation (n=217; 58.2%). Just 9 (2.4%) had gone through pelvic surgery. Most of the athletes (242;64.9%) suffered UI and possessed the symptoms of urgency urinary incontinence (137; 36.7%), while (47;12.1%) had stress UI, and mixed UI was experienced by 60 (16.1%). (107;28.7%) rarely experienced leakage and (51;13.7%) population experienced it sometimes. For quantity, 112 (30.0%) reported leakage of a few drops at one time, while 87 (23.3%) athletes answered only a few drops, while moistened protection (8.3%) and exceeds capacity (3.7%) was also reported. 34.7% did not respond to the question.

Most common aggravating factors for UI was coughing 27.6%, practicing sport 10.7%, sneezing 12.3%, laughing 9.1%, and heavy lifting 5.6%.

## DISCUSSION

A positive relation has been found between athletes and incontinence as the frequency appears to be 64.9% according to our research. A similar study conducted by Cristina et al among Portugal’s athletes revealed 41.5% prevalence of UI<sup>1</sup>. H.H. Thyssen, L. Clevin, S. Olesen, G. Lose et.al investigated 51.9% as the prevalence of UI among females<sup>15</sup> whereas the study

conducted by Zvetanka Simeonova and Calle Bengtsson gave 44% prevalence of UUI. Among those, 1/3 had SUI, 1/3 had UI and 1/3 had mixed incontinence<sup>16</sup>. Carrie Carls, conducted a study to find out 'the prevalence of stress urinary incontinence in high school and college-age female athletes in the Midwest: implications for education and prevention.' Studies established that young female athletes collaborating in excessive sports may be at greater risk for urinary incontinence, results indicated that more than 25% of females experienced incontinence<sup>17</sup>. Jessica and fellows conducted a study to find the prevalence of UI in physically active young women and factors related to it. 22.9% reported UI which occurred rarely once in a month. They found that SUI is the most common type with a prevalence of 60.7% though prevalence of UUI was 25% and MUI was 14.3%<sup>14</sup>. Whereas prevalence of SUI was 12.6%, UUI 36.7% and MUI was 16.1% in our study.

Women who are involved in high impact sports showed higher prevalence with a ratio of 55.5%, whilst women who were involved in low impact sports were 44.5% UI<sup>18</sup>.

Though we found that the duration of activity had association with UI which was 15% among athletes who used to practice >8 hours per week, while 46.1% more frequent in athletes who were practicing for equal to or less than 5 years. Another study conducted by H. H. Thyssen et al reveals that 43% athletes mentioned urinary leakage while taking part in sports and 42% mentioned urinary leakage while performing their routine works. They concluded that the most common activity that provokes urinary leakage is jumping<sup>15</sup>. Moreover H. H. Thyssen et al studied the prevalence of UI among elite athletes and dancers. Their results suggested that UI is common among athletes during their practicing period and daily activities. They also found that during their practicing period, the most common aggravating activity is jumping, that was why gymnasts who are involved in high impact activities had a higher prevalence of UI. They further concluded that the prevalence of UI among gymnasts varied from 0 to 67% depending upon the activity in which they were involved<sup>19</sup>.

However, our study showed that coughing triggers UI more i.e. 27.6%, while prevalence of UI triggers in practicing sports is 10.7%, sneezing 12.3%, laughing 9.1%, and heavy lifting 5.6%. In spite of all, one of the prior studies revealed that percentage of UI during training sessions is higher (95.2%) compared to competitions (51.2%). For that, higher levels of catecholamines during training were cited as a

reason<sup>20,21</sup>. We cannot comment on it because we did not study the levels of catecholamines in our study.

Carrie Carls studied the prevalence of SUI among female athletes and found it to be very common. Among that abundance, 90% of female athletes had never shared their problem and had no understanding of preventive measures while 16% mentioned that UI impacted negatively on their lifestyles<sup>17</sup>. Cristina further added that females are quite hesitant to discuss this problem openly<sup>1</sup>, a trend backed by our study which found that 34.6% female athletes had a problem of UI but they had not discussed it with anyone.

We included young population in our study therefore evident association is not present but a study was conducted by Nygaard IE et.al in 1994 showed that UI is most common in young adulthood in elite nulliparous females<sup>22</sup>. Another study conducted in Andorra shows the prevalence is 37% and increases with age. Moreover, incidence of UI is found to be greater in middle class females and very few consult anyone for it<sup>23</sup>. Moreover, Sousa M. et al. concluded that UI is more common among young elite nulliparous athletes, specifically who are engaged in high impact exercises. Study reported that 74% athletes have a problem of UI and Pelvic Floor Muscle Training strategies show effectual results and seem to be a good treatment technique<sup>24</sup>. The results of our research show that more than half i.e. 81.2% athletic population consider UI as a problem and 49.6% undergo physiotherapy treatment and use various strategies for treatment like, 18.2% of population was found doing Kegel exercises, 15.8% had done abdomen exercises, 12.1% had used bio feedback, 3.5% had used TENS and 3.2% had used some other techniques.

Diana Popova-Dobreva found that 28% athletes encountered UI during their athletic activity, however, after a certain level of exertion, it can occur at any age without having any associated risk factors. Studies found no significant relationship between BMI of women with the symptoms of lower urinary tract dysfunctions or without it. 59% of female athletes have some symptoms of dysfunctions of lower urinary tract, while 41% have no symptoms of dysfunctions of lower urinary tract<sup>25</sup>. Researchers Yngvild s hannestad et. al. in 2003 studied the relationship of UI with various factors and found that increase in BMI has a strong association with UI and high-level exercises can be a cause of UI. On the other hand, they found no association of UI with the increase in frequency of low impact exercises. Moreover, they studied that smoking is associated with UI, smoking of 20 or more cigarettes per day can be a cause. They found that tea drinkers

also had slightly higher chance of incontinence<sup>26</sup>. Lmdingrid Enygaard conducted a study and found a prevalence of SUI 10.9% and 2.7% urge incontinence in elite nulliparous athletes. Further they concluded that age, level of physical activity, and menopause do not have any association with UI<sup>27</sup> while Nygaard IE et al found jumping and high impacting activities can be a cause of UI, and they found a relationship with amenorrhea, hormonal therapy, weight, or participating time<sup>22</sup>. Furthermore, FDA also reports drug use of norethindrone-mestranol (mestranol, norethisterone) causes 0.0702% UI<sup>28</sup>. We found its percentage in our study to be 2.4% to 9.4% and no association was found between usage of periods inducing or delaying drugs with urinary incontinence.

Studies show that majority of athletes or people suffering from incontinence, limit their fluid intake as a preventive measure to avoid incontinence which can be one of the leading causes of constipation. A recent report showed that UI can be worsened by constipation<sup>29</sup>. Our study also showed an association between constipation and UI which is 41.8% prevalent among female athletes.

Regarding the debate between level of fluid intake and UI, cross sectional studies show that there is no association between UI and alcohol intake and between UI and coffee intake<sup>31,32</sup> but high levels of coffee intake cause a detrusor instability<sup>33</sup>.

As a result of our study we concluded that the percentage of prevalence of UI among athletes is significant.

## CONCLUSION

UI frequency among the athletes was found to be 64.9% which shows that UI is a public health concern among female athletes.

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**Conflict of Interest:** There is no conflict of interests of researchers.

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### Peer Review

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