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To evaluate urinary incontinence in female athletes & its association with disordered eating in elite female athletes

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ABSTRACT

The purpose of this study was to evaluate the association between urinary incontinence and disordered eating, in elite female athletes. A cross-sectional study was done including 100 young and healthy women: 50 elite athletes aged 24.54 ± 3.05 years and 50 non-athletes aged 20.84 ± 2.02 years. The International Consultation on Incontinence Questionnaire-Urinary Incontinence-Short Form was used to screen urinary incontinence. The Eating Attitude Test-26 Questionnaire was used to screen disordered eating. Data was analyzed using Odds ratios with 95% confidence intervals (95% CI) to estimate the association between UI and disordered eating. Statistical analysis revealed that Prevalence of urinary incontinence in elite athletes and non- athletes was 29.6% and 14.4%; P < 0.001 respectively. Prevalence of eating disorder in elite athletes and non- athletes was 13.5% and 4.6%; P < 0.001 respectively. Urinary incontinence was associated with disordered eating only in the athletes. After adjustment for age, type of sport, Sports practice frequency (hours/week), athletes with disordered eating presented increased odds of urinary incontinence of any type over non-athletes (OR = 9.23; 95% CI: 0.93-90.8). The study concludes that athletes with disordered eating were three times more likely to present urinary incontinence than women without disordered eating.

Keywords: Urinary Incontinence, Eating Disorders, Female Athletes, Prevalence, Stress Incontinence, Urge Incontinence

INTRODUCTION

According to the definition, Urinary incontinence (UI) is demarcated as “the complaint of any involuntary leakage of urine” and also has shown to be most common among athletes exclusively in sports involving high-impact activities [1]. In this regard urinary incontinence (UI) is a delinquent among females, precisely causing a negative impact on their quality of life [2].

The most evident type of urinary incontinence seen in women is stress urinary incontinence (SUI), distinct as “involuntary loss of urine during coughing, sneezing, or physical exertion such as heavy lifting, sporting activities, or any sudden change of positions.” Comparatively, the other type of incontinence seen in women is urge urinary incontinence (UUI), demarcated as involuntary loss

of urine associated with a sudden, strong desire to void (urgency), and can occur alone or in combination with SUI referred to as mixed incontinence [1].

The rate of prevalence of urinary incontinence is found to be between 10% and 56% in women aged between 15 and 64 years. Rate of prevalence were found to be lower when the ICS definitions of symptoms causing social and hygienic problems were introduced. despite vaginal delivery being the utmost evident risk factors for development of urinary incontinence its prevalence rate was high and proven in young nulliparous physically fit females. According to a study Bo et al, found that 26% of young physical education students had urinary leakage during different forms of physical activities [3].

And also, studies done on a large scale from Norway revealed Eating disorder (ED) prevalence rates is of over 30% for aesthetic sports athletes, 11% for ball game sports athletes and 5–9% for non athletes [4]. In general, studies have proposed a higher frequency of eating problems in athletes than in nonathletes, particularly in athletes competing in sports that emphasize leanness or a low body weight [5]. It has been postulated that hypothalamic amenorrhea attributable to intensive exercise, eating disorders, or a combination of both, resulting in low estrogen levels may contribute to urinary incontinence in female athletes. On the other hand, there is little evidence supporting the common belief that there is an association between low estrogen and prevalence of urinary incontinence [3].

Female elite athletes, in order to optimize body size and composition for competitive success, showed to have abnormal disordered eating attitudes and behavior's such as, restrictive eating, fasting, frequent skipping meals, use of diet pills, laxatives, diuretics, enemas, overeating, binge-eating and purging. Which may indirectly result in lack of some important key macro and micro-nutrients, important for proper skeletal muscle function. Consequently, it can be assumed that disordered eating also may weaken skeletal muscles, including the pelvic floor muscles. And also, prevalence of disordered eating have been shown to be higher in female athletes compared to non-athletes. Regardless of an increased risk of both UI and disordered eating in female athletes, only few studies have showed the association between UI and disordered eating. Thus the purpose of this study is to evaluate the prevalence of urinary incontinence and its association with disordered eating in female elite athletes [1].

MATERIALS AND METHODOLOGY

- **Study design**- cross-sectional study
- **Study setting**- sports academy, higher secondary.
- **Sampling technique**- convenient sampling.
- **Duration of the study**- 6 months.
- **Sample size**- (**50**)-elite female athletes, (**50**)-non-athlete female.

Data collection

Project started after the grant of permission from the ethical committee members The subject included were divided into two groups; Group A-(50) – female elite athletes, Group B-(50) – female non- athletes. 50 elite female athletes (AG) aged 15–48 years, actively competing in their respective national teams for at least one year and who had reached an state, national or international competition level were included. A control group of 50 non-athlete females, exercising twice weekly or less were recruited in high schools, universities and public areas. Exclusion criteria were pregnancy at the time of the study or during the past year, any illnesses.

UI was assessed by the International Consultation on Incontinence Questionnaire-Urinary Incontinence-Short Form (ICIQ-UI-SF). The questionnaire includes three scored items. The first item assesses frequency of leakage (0, never to 5, all the time), the second item assesses amount of leakage (0, none to 6, a large amount) and, the third item determines the overall impact of UI on health related quality of life (a numeric scale is used, rang-ing from 0, not at all, to 10, a great deal). A fourth non-scored item asks about the patient's perception of the type of leakage. Positive responses to involuntary loss of urine associated with coughing, sneezing, physical activity or exercise was classified as stress uri-nary incontinence (SUI). Involuntary loss of urine before reaching the toilet was classified as urgency

urinary incontinence (UUI). The Eating Attitude Test-26 questions (EAT-26), is a self-report survey that is widely used and validated as a reliable screening tool for eating disorders in both adolescents and adults. The EAT-26 consists of 26 forced-choice Likert-scale items. Total scores on the EAT-26, ranging from 0 to 78, are derived as a sum of the composite items. A score that is 20 or a "yes" response to any of the four supplemental behavioral questions identifies disordered eating, is suggestive of an eating disorder, and is considered a positive screen.19 –21 A score more than equal to 20 has been shown to have a sensitivity of 88% and a specificity of 96% in diagnosing individuals with eating disorders-26. The retest reliability of the EAT-26 is high with an coefficient range of 0.84 to 0.94

Explain the two questionnaires to the subjects i.e, international classification of urinary incontinence (ICUI) and Eating Attitude Test-26 (EAT-26).The scores of the two questionnaires i.e, International Consultation on Incontinence Questionnaire (ICIQ-UI-SF) and Eating Attitude Test-26 (EAT-26) in elite female athletes was evaluated using Odds ratios with 95% confidence intervals (95% CI)

STATISTICAL ANALYSIS

Statistical analyses were conducted using SPSS (IBM Corp. Released 2014. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.). Categorical data are presented as counts and proportions and continuous data as mean and standard deviation (SD). Chi-square test was used to test the independency between categorical variables. The magnitude of the association between urinary incontinence and disordered eating was estimated using odds ratio (OR) with 95% confidence intervals (CI) through binary logistic regression models. Estimates were adjusted for age, sports frequency, smoking and alcohol intake. Significance level was set at 0.05 for two-sided tests.

RESULTS

Table 1A: Participants characteristics, prevalence of urinary incontinence and disordered eating among female elite athletes and non- athletes

	ELITE ATHLETES n= 50 Mean (SD)	**NON-ATHLETES n= 50 Mean (SD)**	**p- value**
Age (years)	24.54 (3.05)	20.84 (2.02)	< 0.0001
Sports practice frequency (hours/week)	12.3 (6.0)	3.6 (4.3)	<0.001
Urinary incontinence	**n(%)**	**n(%)**	**p- value**
Any UI	35(70)	05(10)	<0.0001
SUI	05(10)	08(16)	0.2799
UUI	05(10)	07(14)	0.2440
EAT- 26 Score	48(96)	19 (38)	<0.0001

(p< 0.05 - Significant*, p < 0.001 - Highly significant)**

Table 2A: Prevalence of urinary incontinence according to disordered eating in athletes

	No UI	**Any UI**	**P value**
EAT-26 Score			
>20	10 (20.8)	25 (52.0)	<0.0001
<20	15 (31.2)	02 (4.16)	
	No SUI	**SUI**	**P value**
EAT-26 Score			
>20	**01 (2.08)**	**04 (8.33)**	<0.0001
<20	**33 (68.7)**	**10 (20.8)**	
	No UUI	**UUI**	**P value**
EAT-26 Score			
>20	01 (2.08)	04 (8.33)	<0.0001
<20	30 (62.5)	13 (27.0)	

(p< 0.05 - Significant*, p < 0.001 - Highly significant)**

Table 3A-: Association between disordered eating and urinary incontinence (any urinary incontinence, stress urinary incontinence & urge incontinence) in athletes

	Any UI Odds ratio (95% CI)	SUI Odds ratio (95% CI)	UUI Odds ratio (95% CI)
EAT-26 Score			
>20	Ref. fig 1	Ref. fig 2	Ref. fig 3
<20	18.75(3.60-97.4)	13.2 (1.31-132.0)	9.23 (0.93-90.8)

DISCUSSION

The aim of our study was to evaluate urinary incontinence and its association with disordered eating in female elite athletes. Elite female athletes were 3 times more likely to present urinary incontinence than non- athletes without disordered eating.

And also, prevalence of any UI, SUI and UUI was found to be higher in elite female athletes. The prevalence of eating disorder was found to be higher in elite athletes than non-athletes.

Table 1A shows participants characteristics, prevalence of urinary incontinence and disordered eating among female elite athletes and non-athletes. The prevalence among age groups and sports practice frequency (hours/week) was found to be statistically significant with the p-value of <0.0001, the reason behind this may be because there has been increase participation of young girls in sports at a high competetion level. So the prevalence of urinary incontinence is found to be high in elite athletes because due to the intensity of training there might be increased risk of musculoskeletal injuries, which may have an effect on the PFM structures in teen elite female athletes. And also, studies have hypothesized that UI during sports can lead to decreased sports performance [1].

Table 2A shows there was no statistically significant difference in prevalence of disordered eating between those practicing low impact sports compared with high impact sports. Also, there was no association between UI and disordered eating (any UI, SUI, UUI) in non-athletes. In athletes, the prevalence of UI of any type was higher among those with disordered eating. When considering the EAT-26 Score, prevalence of any UI, SUI and UUI was higher among elite athletes with p- value 0.0001.

Previous studies reported that, different trends of disordered eating prevalence were seen between female athletes from different sports.

Similar study reported that the prevalence rates of disordered eating in elite athletes vary from 3% in ball game [9] sports athletes to 32.2% in athletes competing in weight-sensitive sports [8]. The reason, for this wide range of prevalence of disordered eating described in the literature can be due to different sample sizes, type of sports included, use of different definitions, investigations at different seasons, investigators (coach, researchers), age groups and psychological factors [10].

Previous studies have hypothesized that disorders eating also may weaken the skeletal muscles, including the pelvic floor muscles due to the lack of some macro and micro-nutrients important for proper skeletal muscle functioning [8], consequently may result in UI in elite athletes.

Table 3A, since there was no association found between UI and disordered eating was in non-athletes, the magnitude of the association was only estimated in athletes. After adjustment for age, type of sports, sports practice frequency, ath-letes scoring higher than 20 in the EAT-26 score, were about 3 times more likely to present UI of any type (OR = 9.23; 95% CI 0.95–90.8) in comparison to those without disordered eating.

Previous studies have reported that two studies, one in a small sample of female runners and another in a large sample of elite female athletes, found a higher prevalence of UI in athletes with disor-dered eating than in those with non-disordered eating. However, these studies did not report the magnitude of the association between UI and disordered eating and did not control for confound-ing factors.

Hence, in the present study, athletes with disordered eating presented 3 times higher odds of UI after adjusting for potential confounders,

suggesting that disordered eating could play a role in UI in female athletes. The association of eating disorder with urinary incontinence can be well explained as high-level female elite athletes, lack proper nutrition in order to optimize body size and composition for competitive success, and results in abnormal eating attitudes such as, restrictive eating, fasting , frequent skipping of meal, use diet pills, laxatives, binge-eating and purging [6, 7]. Which may compromise the intake of essential macro (carbohydrates, proteins) and micro-nutrients (vitamins B and D)21 needed to support proper skeletal muscle function. A suboptimal intake of carbohydrates could result in premature muscle glycogen depletion during train-ing and competition, leading to muscle fatigue. Also, the lack of some key micronutrients, such as iron, vitamin D and calcium have been referred to play an important role on skeletal muscle function. Striated muscles of the pelvic floor, including the ure-thral sphincter muscle, contribute to the urethral support system and increase in maximal urethral closure pressure during increases in intra-abdominal pressure [1]

Present study spreads awareness of urinary incontinence and disordered eating in elite female athletes. The association of disordered eating is strongly associated with urinary incontinence and hence further evaluation of PFM can also be studied,

CONCLUSION

Elite athletes presented a high prevalence of urinary incontinence. Athletes with disordered eating were 3 times more likely to report urinary incontinence than women without disordered eating. Both urinary incontinence and disordered eating can have a negative impact on the athletes "wellbeing". We therefore recommend that elite female athletes should be screened for both UI and disordered eating. Prevention and treatment strategies for both conditions in female athletes should be evaluated in future studies.

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REFERENCES

[1]. Alice Carvalhais and Joana Araújo et al, Urinary incontinence and disordered eating in female elite athletes. Journal of Science and Medicine in Sport. 2018, JSAMS-1897, 5.
[2]. Alice Carvalhais and Renato Natal et al, Performing high-level sport is strongly associated with urinary incontinence in elite athletes. Sports Medicine. 2018, 6. doi:10.1136/ 097587
[3]. Kari Bo and Jorun Sundgot et al, Prevalence of stress and urge urinary incontinence in elite athletes and controls. Norwegian University of Sport and Physical Education. 2001, 0195-9131/01/3311-1797-1802.
[4]. Pia Thiemann and Tanja Legenbauer et al, Eating Disorders and their putative risk factors among female german professional athletes. European Eating Disorders Rev. 2015, 269–76.
[5]. Jorunn Sundgot and Monica Klungland Torstveit et al, Prevalence of Eating Disorders in Elite Athletes Is Higher Than in the General Population. Clin J Sport Med. 14, 2004, 1.
[6]. Nattiv and Loucks et al, American College of Sports Medicine position stand. Med Science Sports Exercise. 39(10), 2007, 1867-82.
[7]. Kong and Harris et al, The sporting body: body image and eating disorder symptomatology among female athletes from leanness focused and nonleanness focused sports. J Psychol. 149(1-2), 2007, 141-60.
[8]. Torstveit and Rosenvinge et al, Prevalence of eating disorders and the predictive power of risk models in female elite athletes: a controlled study. Scand J Med Sci Sports. 18(1), 2008, 108-18.
[9]. Thiemann P and Legenbauer T et al, Eating disorders and their putative risk factors among female German professional athletes. Eur Eat Disord Rev. 23(4), 2015, 269-76.
[10]. Sundgot-Borgen and Torstveit et al, Aspects of disordered eating continuum in elite high-intensity sports. Scand J Med Sci Sports. 20, 2010, 112-21.

[11]. Hajebrahimi and Nourizadeh et al, Validity and reliability of the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form and its correlation with urodynamic findings. Urol J Fall. 9(4), 2012, 685-90.

[12]. David H Gleaves and Crystal A Pearson et al, Measuring eating disorder attitudes and behaviors: a reliability generalization study. Journal of Eating Disorders. 2014, 2-6.

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