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Research Article

Screening of Urinary Incontinence in Female Dancers-A Cross Sectional Study

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Abstract

Background and Objective: Urinary Incontinence (UI) is involuntary loss of urine which lead to withdrawal from activities and is considered as a barrier for life-long participation in various activities. Hence, study aimed to know the incidence of urinary incontinence in female dancers to that of non-dancers of same age group in Belagavi city. The study also aimed to find the correlation between the type of dance, intensity of dance and BMI of dancers to that of urinary incontinence. **Materials and Methods:** An open ended sample of female dancers, practicing various dance forms at recreational, competitive center and physiotherapy department with age ranging from 18-25 years were screened for UI for duration of six months. **Results:** Overall, 124 females were screened out of which 62 subjects were dancers and 62 were non dancers (age matched control) and 14 female dancers (22.5%) reported urine loss while participating in their various dance forms. Hip hop had highest incidence about 50% incontinence followed with Bharatnatyam 28% with $p < 0.0015$. The BMI of dancers with respect to dance was evaluated and $p < 0.001$. Urinary incontinence according to training period in 1-5 years, 6-10 years and ≥ 11 years training period groups was 18.18, 27.59 and 18.18% with $p < 0.0002$, respectively and suggested that urinary incontinence increases with respect to training period. **Conclusion:** The study concluded that 22.5% of female dancers experienced urinary incontinence, BMI and training period of dancers showed to have positive correlation with urinary incontinence.

Key words: Urinary incontinence, female dancers, nulliparous dancers, classical dance and western dance, hip hop

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Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Dance is a performance art form consisting of purposefully selected sequence of human movements, which has aesthetic and symbolic value and acknowledged as dance by performers and observers with in a particular culture¹. There are different types of dance forms in the world and established by different places and culture. Dance forms are broadly classified as eastern and western dance i.e., classical based dance and western dance. In India according to states different dance forms are known like Bharatnatyam, Kathak, Odyssey, Kuchipudi, Manipuri and many more and western dance forms are Hip-Hop, Locking and Popping, Jazz, Salsa, Tap dance, Cabaret, Belly dancing, Ballet, Passo etc.².

The health problems of dancers are worthy of attention for several reasons; first because most dancers begin training at young age, there is potential for great impact on their future health, secondly; the interplay of physical and aesthetic demands in dance may lead to various health issues especially relevant to dancers³. However, dance with strict selection and training regiments have succeeded in transforming dance to an activity practiced by individual who have selectively developed different flexible characteristics compared with athlete. Like in athletes, dancers also have specific conditions like amenorrhea, disordered eating, osteoporosis and urinary incontinence^{4,5}.

World Health Organization (WHO)⁶ stated, urinary incontinence is a "wide spread global disease and one of the last medical taboos to many people". International Continence Society (ICS) has defined Urinary Incontinence as the involuntary loss of urine which is a social or hygiene problem. It is not a life threatening disease but affects all the strata of the society, having many medical and social ramifications⁷. Urinary incontinence is more common in women of all ages than in men. SUI is the most prevalent type of urinary incontinence with prevalence rates between 10 and 55% in women between ages 15 and 64 years. Stress urinary incontinence has shown to lead to withdrawal from participation in high impact activities such as gymnastics, aerobics and running. SUI has been reported to occur in two-thirds of female gymnasts and 28% of female collegiate athletes⁸. Therefore, this study aimed to examine the incidence of urinary incontinence in female dancers to that of non-dancers of same age group and the correlation between the type of dance, intensity of dance and BMI of dancers to that of urinary incontinence in Belagavi city.

MATERIALS AND METHODS

A total of 124 subjects were screened for 6 months, out of which 62 were screened at recreational, competitive center and dance studios in and around Belagavi city and 62 normal health control (Non-dancers) were from physiotherapy department. The age ranging from 18-25 years. Inclusion criteria were female dancers, unmarried females, dancers who are willing to participate in the study. Exclusion criteria were Symptomatic Urinary Tract Infection, Neurogenic Bladder, Gigggle Incontinence, Chronic cough, Constipation, Adverse medication effects. Ethical clearance for the present study was obtained from institutional ethics committee on human subject's research. Waver of consent was taken from institutional ethics committee as no identifiable information was revealed. Demographic characteristics and history of subjects were recorded such as: Age, Type of dance, Menstrual history, Body Mass Index (BMI), Training history, Incontinence experience during physical activity and during dancing.

Screening of urinary incontinence was done using 3 questionnaires namely: Questionnaire for Urinary Incontinence Diagnosis (QUID)- A 6-item urinary incontinence (UI) symptom questionnaire was developed and validated to distinguish stress and urge UI. The 3-items focus on stress incontinence symptoms and three on urge incontinence symptoms. Each item includes 6 frequency-based response options, ranging from "none of the time" to "all of the time", which are scored from 0 to 5 points⁹.

Revised Urinary Incontinence Scale (RUIS): The RUIS is a short, reliable and valid 5-item scale that can be used to assess urinary incontinence and to monitor patient outcomes following treatment. Each item includes 4 frequency based response options, ranging from "not at all" to "greatly", which are scored from 0 to 4 points¹⁰.

King's Health Questionnaire (KHQ): The KHQ is a patient self-administered self-report. It has 3 parts consisting of 21 items. Part 1 contains the general health perception and bladder problem (one item each). Part 2 contains role limitations, physical limitations, social limitations (two items each), personal relationships, emotions (three items each) and sleep/energy (two items), severity measures (four items). Part 3 is considered as a single item and contains ten responses in relation to frequency, nocturia, urgency, urge, stress, intercourse incontinence, nocturnal enuresis, infections, pain and difficulty in voiding¹¹.

Data analysis: Statistical analysis for the present study was done manually as well as using statistical package of social sciences (SPSS) version 21 so as to verify the results obtained. Percentage of distribution, Mean, standard deviation and test of significance. The $p < 0.05$ was considered significant.

RESULTS

Incidence of urinary incontinence in dancers as a whole was 22.5%. Total number of dancers screened were $n = 62$, among which $n = 14$ reported urinary incontinence. The dancers reported that they experienced urinary incontinence more in cold season. The incidence of urinary incontinence in non-dancers as a whole was 11.29%. Total number of non-dancers screened were $n = 62$, among which $n = 7$ reported urinary in continence (Table 1).

Incidence of stress, urge and both type of urinary incontinence was found to be 12.90, 8.06 and 1.61%. The proportion of type of urinary incontinence were: in each stress ($n = 8$), urge ($n = 5$) and both ($n = 1$) with total of 14 subjects (Table 2). Incidence of urinary incontinence according to training period in 1-5 years, 6-10 years and ≥ 11 years training period groups was 18.18, 27.59 and 18.18%, respectively. Which suggested that urinary incontinence increases with respect to training period (Table 3).

Table 1: Incidence of urinary incontinence in dancers and non-dancers

Group screened	Total no. of screened	No. of incontinence	Samples incontinent (%)
Dancers	62	14	22.5
Non dancers	62	7	11.9

Table 2: Incidence of stress, urge and both type of urinary incontinence

Type of incontinence	No. of sample	Sample (%)
Stress	8	12.90
Urge	5	8.06
Both	1	1.61
Total	14	100.00

Table 3: Incidence of incontinence according to training period

Age groups	Incontinence	Percentage	Continence	Percentage	Total	p-value
1-5 years	4	18.18	18	81.82	22	0.0002*
6-10 years	8	27.59	21	72.41	29	
≥ 11 years	2	18.18	9	81.20	11	
Total	14	22.58	48	77.42	62	

Table 4: Incidence of incontinence in different dance forms

Types of dance	Incontinence	Percentage	Continence	Percentage	Total	p-value
Aerobics	0	0.00	4	100.00	4	0.0015*
Bharatnatyam	7	28.00	18	72.00	25	
Hip hop	2	50.00	2	50.00	4	
Kathak	1	12.50	7	87.50	8	
Western	4	19.04	17	80.95	21	
Total	14	22.58	48	77.42	62	

Different types of dances like Aerobic, Bharatnatyam, hip hop, kathak and western has 22.58% incidence of urinary incontinence. The proportions in different forms of dance were: In each dance, Aerobic ($N = 0$), Bharatnatyam ($N = 7$), Hip hop ($N = 2$), Kathak ($N = 1$), Western ($N = 4$) with total of 14 subjects (Table 4). The mean BMI of classical dancers were 23.14 ± 1.90 and western dancers were 21.48 ± 2.02 and the p-value for the same was 0.0001 which was statistically significant (Table 5). The mean BMI in non-dancers was 23.20 ± 3.64 and $p = 0.922$ which was not statistically significant.

DISCUSSION

The present study was conducted to find the incidence of urinary incontinence in young nulliparous female dancers within the age group of 18-25 years. The present study included the outcome measures which are reliable and valid such as Questionnaire for Urinary Incontinence Diagnosis (QUID), Revised Urinary Incontinence Scale (RUIS), King's Health questionnaire (KHQ) were these questionnaires are used to measure the symptoms of UI in women but never used on dancers as per previous studies. Young nulliparous and physically active women have shown to have highest prevalence of stress urinary incontinence according to Eliasson *et al.*¹². In present study 22.5% female dancers experienced stress urinary incontinence. This could be due to extensive time the dancers spend practicing and performing, overuse injuries are more common than acute injuries¹³. In the present study incidence of urinary incontinence in young nulliparous female dancers was found to be 22.5%. Particularly seen in certain dancers like Bharatnatyam (28%) and Hip hop (50%) where there is more used of lower extremity which leads to increased flexibility of lower limb. Similarly Pozo-Municio *et al.*¹⁴ also found that dancers experience genito urinary condition some point in their life.

Table 5: Co-relation of BMI and type of dance to that of urinary incontinence

Type of dance	Mean BMI $\pm$ SD	SE	t-value	p-value
Classical	23.14 $\pm$ 1.90	0.33	3.3260	<0.0001*
Western	21.48 $\pm$ 2.02	0.38		
Non-dancers	23.20 $\pm$ 3.64	0.66	0.000	0.922

SE: Standard error

Postures attained for a longer period of time leads to urinary incontinence. Therefore in the present study Bharatnatyam dancer's experienced urinary incontinence this could be due to the posture attained called Araimandi which squatting position with both arms extended for a longer period of time overloaded with body weight of an individual¹⁵. This posture gives pressure in the lower tier of the pelvic support and leads to urinary incontinence in dancers which was similar to study conducted by Thyssen *et al.*⁵ in ballet dancers, as similar posture is attained in these two dance forms.

In the present study urinary incontinence was experienced more in between 6-10 years of training period which was due to overuse or recurrent injuries than acute injuries which might have caused due postures attained and increased flexibility of lower extremity. Another reason for urinary incontinence could be co-activation of abdominal muscles and pelvic floor muscles due to rise in intra-abdominal pressure to stabilize lower limbs which is observed during fixed posture¹⁶. Hence, in the present study 18.18% of dancers experienced urinary incontinence in 1-5 years and 27.59% of dancers experienced urinary incontinence in 6 to 10 years of training period, which suggested that as training period increases or repeated exposure to high forces of pelvic floor muscles, the risk of urinary incontinence increases in female dancers¹². Carol casper conducted a study with athlete and non-athlete females aged between 18-25 years and found that there was no significant difference in pelvic floor muscle activity between athlete and non-athlete, which suggest that pelvic floor muscle activity alone does not predict urinary incontinence¹⁷.

Previous studies conducted shows BMI and urinary incontinence are strongly correlated, similarly our study also showed positive correlation of BIM and urinary incontinence to that of dancers, i.e., as BMI of dancers increases urinary incontinence increases. This could be due to systemic mechanism where there is generalize increase in adipose tissue in body which can cause vascular damage to pelvic floor muscle and lead to dysfunction of detrusor and sphincter muscle via oxidative stress¹⁸.

In the present study dancers also reported decreases quality of life this could be due to increased BMI which causes incontinence, thereby increasing physical limitations, role limitations and giving rise to reduced general health of

dancers. The emotional domain was also effected in present study as it would be due to depression, anxiety, reduced self-esteem and self-confidence due to urinary incontinence in dancers¹⁹. The strength of the present study, It is the first of its kind, in Indian scenario provides a contribution to the sparse scientific literature about the incidence of urinary incontinence in different Indian dance form and experiencing UI or at risk for developing UI.

CONCLUSION

The study concluded that 22.5% of female dancers had urinary incontinence. About 50% of Hip hop dancers and 28% of Bharatnatyam dance forms showed to have higher incidence as compared to other dance forms, BMI had a positive correlation with urinary incontinence in classical and western dancers and training period is directly proportional to risk of urinary incontinence. The study also reported reduced quality of life in dancers with urinary incontinence.

SIGNIFICANCE STATEMENT

The present study reported 22.5% of female dancers experienced urinary incontinence and BMI and training period had a positive correlation with urinary incontinence, which contributed to literature. The study also found hip-hop and Bharatnatyam dance forms had highest prevalence of urinary incontinence. The symptoms of urinary incontinence lead to overall reduced quality of life in dancers. Finding the prevalence of urinary incontinence in female dancers lead to forming a structured program for strengthening of pelvic floor muscles. This study also gives justification of how pelvic floor muscle weakness occurs and leads to urinary incontinence in female dancers.

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