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Urinary Incontinence Among Group Fitness Instructors Including Yoga and Pilates Teachers

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Aims: Controversies exist on the role of physical activity on urinary incontinence (UI), and search on PubMed revealed no studies on UI in fitness instructors. The aim of this study was to investigate the prevalence of UI among female group fitness instructors, including Pilates and yoga teachers. **Methods:** This was a cross-sectional study of 1,473 instructors representing three of the largest fitness companies recruited from 59 fitness centers in Norway. They filled in an online survey (Questback) about general health, educational background, and number of hours teaching per week. Prevalence of UI was evaluated by the International Consensus on Incontinence Questionnaire, short form (ICIQ-UI SF). **Results:** Three out of 152 men (2%) reported UI. Six hundred eighty-five women, mean age 32.7 years (range 18–68) answered the questionnaire. 26.3% of all the female instructors reported to have UI, with 21.4% reporting leakage ≥once a week, 3.2% 2–3 times/week and 1.7% ≥once per day. 24.4% reported the leakage to be small to moderate and the bother score was 4.6 (SD 2.4) out of 21. 15.3% reported leakage during physical activity and 10.9% when coughing/sneezing. 25.9% of yoga and Pilates instructors reported UI. **Conclusions:** This is the first report on UI among fitness instructors and the results indicate that UI is prevalent among female fitness instructors, including yoga and Pilates teachers. More information about this topic seems to be important in the basic education of fitness instructors. *Neurourol. Urodynam. 30:370–373, 2011.*

Key words: fitness; group training; Pilates; prevalence; urinary leakage; YOGA

INTRODUCTION

The prevalence rates of urinary incontinence (UI) vary between 13% and 60% in the general population, and daily UI ranges from 5% to 15%.[1] There is level 1 evidence that being of white non-hispanic ethnicity, pregnancy, labor and vaginal delivery, body mass index (BMI), and use of oral estrogen in women older than 55 years are significant risk factors for UI.[1] A high prevalence of UI has been found in elite athletes and dancers,[2] and hard work and exercise have been considered potential risk factors due to increases intra-abdominal pressure and the impact from ground reaction forces. UI and especially stress UI (SUI) has shown to be a barrier for participation in physical activity for women[3,4] and women may drop-out or change their activity pattern due to UI.[5] However, some epidemiological studies have also found a long-term positive association between participation in regular physical activity and lower prevalence of UI.[6–9]

One group of women considered to be both fit and healthy is group fitness instructors. They are, however, exposed to many hours of intense exercise per week and often teach a combination of high-impact (running and jumping) and low-impact activities (walking and step choreography). Search on PubMed did not reveal any prevalence studies of UI in this particular group of women. Hence, the aims of the present study were to investigate prevalence of UI among group fitness instructors including yoga and Pilates instructors, and to compare background variables in those with and without UI.

MATERIALS AND METHODS

This was a cross-sectional study using an online questionnaire to evaluate health issues in group fitness instructors in Norway. Approval for the study was given from the Regional Committee for Medical and Health Research Ethics in Southern Norway (S-08713a).

Population and Sample

Male and female group fitness instructors in the three largest fitness companies in Norway were asked to participate in the study. Inclusion criterion was teaching at least one class per week during the spring semester of 2009. Exclusion criterion was inability to understand Scandinavian language. A total of 1,473 instructors from 59 centers were contacted according to the inclusion criterion. Of these, 78 instructors had invalid contact information and were therefore unavailable for the study.

Procedure

The head of group training at each of the contacted fitness centers provided the e-mail addresses for the instructors. As we did not have permission to receive the instructors' names, postal addresses, or phone numbers, instructors with invalid contact information were not available for participation. The potential respondents were contacted for the first time via e-mail in May/June 2009. They received written information about the study, and were informed that participation was voluntary and that they were anonymous to the researchers. Up to two reminders were sent to the instructors who did not

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respond (i.e., either did not submit the questionnaire, or gave feedback that he/she did not want to participate in the study).

The Questionnaire

The questionnaire contained questions about age, education, number and types of classes taught per week, exercise history, height and weight, injuries, and different health issues. Questions on quality of life and satisfaction with their general health condition were according to the Oslo Health Study.[10] The questionnaire was filled out through Questback, an online survey system (www.questback.com).

The International Consultation on Incontinence Questionnaire- UI- short form (ICIQ-UI SF) was used to assess UI.[11] The questionnaire comprises three scored items with assessment of frequency, severity and perceived impact of incontinence in addition to an unscored self-diagnostic item. A sum-score is made by adding scores from the three scored questions. The lowest score if the respondent reports UI is 3, and the maximum score is 21. Psychometric properties of the questionnaire have been tested, including its content, construct and convergent validity, reliability and responsiveness/sensitivity to change. ICIQ-UI SF has been translated into 30 languages, included Norwegian, and is recommended to be used in randomized controlled trials and epidemiological studies.

Definitions used in the present study are according to the International Urogynecological Association (IUGA)/International Continence Society (ICS) Joint Report on the Terminology for Female Pelvic Floor Dysfunction.[12]

Statistical Analyses

SPSS version 15 for Windows was used for data analyses. Background variables are presented as frequencies, percentages or means with standard deviations (SD). χ^2-test and independent *t*-test were used to compare categorical and continuous background variables between those with and without UI. A *P*-value of <0.05 was considered statistically significant.

RESULTS

Eight hundred and forty-seven out of 1,473 available instructors (152 men and 685 women) responded (response rate 57%).

Three of the men (2%) and 181 women (26.4%) reported UI. All men reported post-micturition dribble and no leakage during physical activity. Because of small numbers, no further analyses were undertaken for the male population. Background variables of the female instructors are listed in Table I. The participants had worked as group fitness instructors for mean 8.8 years (SD 6.6) and mean number of classes taught per week was 3.2 (range 1–25). In addition 96.6% reported to exercise regularly on their own >once/week with 89.2% training endurance activities, 81.7% strength training, 29.5% yoga/Pilates, 8.4% power activities, and 21.2% other activities. Ninety-six percent reported their quality of life to be good/very good whereas 90% reported to be satisfied/very satisfied with their general health.

TABLE I. Background Variables for Female Group Fitness Instructors

Age (years)	32.8 (8.3, range 18–68)
Weight (kg)	63.2 (8.2)
BMI (kg/h^2)	22.5 (2.4)
Using oral contraceptives (n)	244 (35.6%)
Irregular menstruation (n)	177 (25.8%)
Self-reported eating disorder (ED)	
Yes, presently	27 (3.9%)
No, but previously	177 (25.8%)
Have received treatment for ED	61 (8.9%)
Mean hours of fitness teaching/week	3.2 (SD 3.1)
Education	
Bsc	366 (53.4%)
Master	117 (17.1%)
Smoking	
Daily	17 (2.5%)
Irregular	74 (10.8%)

N = 685, numbers and percentages or mean with range or standard deviation (SD).

Table II shows prevalence of different types of UI among female instructors. Most of the instructors reported to have SUI. 21.8% reported leakage ≥once a week, 3.2% 2–3 times/week and 1.4% ≥once per day. 24.8% reported the leakage to be small to moderate and the effect on daily life was mean 1.3 (range 0–9). The ICIQ-sumscore was 4.4 (SD 2.2) out of 21.

Table III shows difference in background variables between those reporting UI and those not. Female instructors who were older, had been teaching for a longer period of time, and were not using oral contraceptives had a statistical significant higher prevalence of UI. No significant difference between continent and incontinent instructors were found in BMI, number with irregular menstruation, number with self-reported eating disorder, or mean number of classes taught per week. Comparing prevalence of UI according to former participation in different sport activities, showed that only instructors who previously participated in endurance sports reported a borderline statistically significantly higher prevalence of UI (38.5 vs. 29.6%, $P = 0.05$). The prevalence of UI in instructors teaching yoga/Pilates was 25.9%.

DISCUSSION

This study found a similar prevalence of UI in group fitness instructors as has been shown in the general female

TABLE II. Type of Urinary Incontinence Reported by Female Fitness Instructors

	N (%)
Leaks with coughing/sneezing (stress urinary incontinence)	75 (10.9)
Leaks with physical activity/exercise (stress urinary incontinence)	104 (15.2)
Leaks before getting to the toilet (urge urinary incontinence)	39 (5.7)
Leaks after finishing urinating and are dressed (post-micturition dribble)	9 (1.3)
Leaks for no obvious reason	9 (1.3)
Leaks when asleep	0
Leaks all the time	0

Numbers reporting leakage: 181/685.

TABLE III. Comparison Between Female Group Fitness Instructors With and Without Urinary Incontinence

	Incontinent (N = 181)	Continent (N = 501)	*P*-value
Mean age	35.0 (SD 8.2)	32.0 (SD 8.3)	0.00
Mean BMI	22.4 (SD 2.2)	22.5 (SD 2.4)	0.47
Number using oral contraceptives	43 (23.8%)	200 (40.2%)	0.00
Number with irregular menstruation	46 (25.8%)	130 (26.3%)	0.91
Number with self-reported eating disorder			
Now	9 (5.0%)	18 (3.6%)	0.59
Previously	43 (24.0%)	133 (26.6%)	
Mean number of years as fitness instructor	9.9 (SD 7.1)	8.4 (SD 6.5)	0.01
Mean number of classes per week	3.3 (2.9)	3.4 (4.1)	0.75

population,[1] and yoga and Pilates instructors reported a prevalence equal to that of the other fitness instructors.

A former study has found a higher prevalence of stress and urge incontinence in female elite athletes with eating disorders compared to aged matched controls.[13] This finding was not confirmed in the present study, and neither did we find any difference in prevalence in those with irregular menstruation. Eating disorder was self-reported in this study and thus the proportion of women actually suffering from eating disorder is probably underestimated.[14] However, our findings support the current consensus suggesting that estrogen depletion is not a risk factor for UI.[1]

Former endurance athletes were borderline significant more likely to have UI. Elite athletes representing different endurance sports have higher prevalence of menstrual irregularity and eating disorder as compared to other elite athletes in ball game sports, technical sports, and power sports.[14,15] However, they may also be more likely to continue with strenuous high impact activities as their chosen fitness activity and teach high impact aerobics.

Some epidemiological studies in the general population indicate that long term, moderate physical activity is inversely associated with UI.[1] However, all studies on UI and physical activity may be biased by a high drop-out rate from physical activity and change of activity pattern in incontinent women.[3,5,16] The results of the present study support several studies conducted in subgroups of physically active women and elite athletes showing a high prevalence of UI among exercisers and do not support the hypothesis that participation in general physical activity is associated with continence.[2]

Comparable and even higher prevalence rates of UI have been found in female elite athletes, especially in those performing high impact activities such as gymnastics, trampoline jumping, track and field, and ball games. In these groups prevalence rates vary between 35% and 80%.[13,17–19] A high percentage of the instructors were doing additional training by their own, and most of them were doing endurance activities implying exposure to high impact activities. We cannot rule out whether their incontinence happened during their teaching classes or during their recreational activities. Incidence and development of UI must be investigated in a prospective longitudinal study, and a cross-sectional design, as used in the present study, cannot rule out causality. We can only state that the prevalence ofUI, and especially SUI, is high in female group fitness instructors.

As far as we have ascertained this is the first study reporting prevalence of UI in group fitness instructors, and also in yoga/Pilates instructors. Many yoga and Pilates instructors claim that they incorporate PFMT into other exercises, and that this training is effective in teaching PFMT.[20] As specific PFMT has proven to be effective in prevention and treatment of SUI and mixed incontinence,[21] one could expect that co-contractions of the PFM during other exercises may be efficacious. However, except from a pilot RCT by Savage,[20] search on PubMed did not reveal any studies evaluating such training programs on UI. In the Savage study only 4 and 6 women in the PFMT and Pilates group participated in the pre and post-tests, respectively, and no comparison between groups was possible.[20] A recent study using perineal ultrasound to assess a possible co-activation of the PFM during commonly used yoga and Pilates exercises did not show a significant co-contraction.[22] In addition, Bø et al.[23,24] found that some women do not have a co-contraction of the PFM during contraction of the transversus abdominis muscle. The present study supports that general exercise does not seem to protect against UI and confer with many studies showing a high prevalence among exercisers.[13,17–19] Long-term follow-up studies, however, have not shown any negative long term effects of former high-impact exercise on UI.[13,25] Hence, exercise may only unmask an underlying condition, which would not have been revealed if the woman was sedentary.

Caution must be taken when interpreting our results due to the 57% response rate. However, since this was a general questionnaire on educational background and health issues in group fitness instructors, we have no reason to believe that the questions on UI influenced the response rate. Because we used an online survey questionnaire, none of the questions were revealed until they appeared during filling in, and missing data were <1%. In general, responders to questionnaires have a higher education level than non-responders.[26] However, the educational level in the present study was high. The validity of our results are supported by the fact that they are in line with prevalence rates found in other published studies conducted in subgroups of physically active women and elite athletes.[2] Further and more detailed prevalence studies in this specific group of women should be conducted to validate our results and to give more in depth knowledge about causative factors.

PFMT has Level 1, grade A evidence to be effective in prevention and treatment of stress and mixed UI and is recommended as first-line treatment for UI.[21] Cure rates of PFMT vary between 44% and 80%, depending on supervision and training dosage, and the training has no known side effects.[27] However, so far, no RCT has been conducted in elite athletes or fitness instructors who are exposed to frequent and huge amounts of exercise, and we do not know the effect of PFMT instructed in a general fitness class for women.[28] Fitness instructors are in a unique position to teach PFMT to a huge number of women, and this study indicates that many instructors are in need of training the pelvic floor themselves. Hence, education on pelvic floor function and dysfunction and how to conduct effective PFMT is recommended as part of the curriculum for fitness instructors.

CONCLUSIONS

The results of the present study indicate that UI is prevalent among female fitness instructors, including yoga and Pilates teachers. More information about this topic seems to be important in the basic education of fitness instructors.

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