

## URINARY INCONTINENCE IN THE NETHERLANDS: PREVALENCE AND ASSOCIATED RISK FACTORS IN ADULTS AND CHILDREN

### Hypothesis / aims of study

The aim of this study was to determine the prevalence of urinary incontinence (UI) and associated risk factors in adults and children living in the Netherlands.

### Study design, materials and methods

This study was designed as a cross-sectional, population-based study. A company that specializes in performing surveys, created a sample by using a database of respondents living in the Netherlands. Adult participants (aged 18 years or older) in this database received a digital link that enabled them to fill out the the validated Groningen Defecation and Fecal Continence (DeFeC) Checklist. Out of the 3031 respondents who started filling out the checklist, 1642 (54.2%) actually filled it out completely. A selection of the completed checklists was made in order to obtain a representative cohort. The included respondents were distributed equally across gender, region of the Netherlands, educational level, and age, in accordance with the Dutch population pyramid, as reported by Statistics Netherlands(1). Out of these 1642 checklists, 1259 (76.7%) were selected for analysis. During further examination of the checklists, two respondents were excluded due to illogical answers. Finally, 1257 checklists filled out by adults were analyzed.

For the analysis the adult respondents were divided into subgroups based on gender and age. Three age groups were formed: 18–39-year-olds, 40–59-year-olds, and 60–85-year-olds. Based on their body mass index (BMI) respondents were grouped either as underweight (BMI < 18.5 kg/m<sup>2</sup>), normal (BMI between 18.5 to 25 kg/m<sup>2</sup>), overweight (BMI between 25 to 30 kg/m<sup>2</sup>), or obese (BMI > 30 kg/m<sup>2</sup>) in accordance with the WHO guidelines.

Children (aged 8-17 years old) received the Groningen Pediatric Defecation and Fecal Continence (P-DeFeC), which is the equivalent of the adult version of the DeFeC checklist. The checklists consists of the same questions. The P-DeFeC however is worded in a way that is understandable to a eight year old child. In total 241 children filled out the checklist completely, one was excluded due to illogical answers.

Two age groups were formed out of the child respondents: 8-12-year-olds and 13-17-year-olds. Based on their body mass index (BMI), children were grouped either as underweight, normal weight or overweight.

UI was defined as any involuntary leakage of urine in the past six months. Respondents were further classified as having stress UI, urge UI, mixed UI or any other form, such as: 'while asleep', 'for no clear reason', 'continuously, or 'while getting dressed after urinating'. Definitions according to the International Continence Society were used for this study.

### Results

#### **Adults**

The prevalence of UI in the adult group was 36.8%. Women experienced UI significantly more often than men (49.0% versus 22.6%, respectively,  $P < 0.001$ ). We found that in both men and women the prevalence of UI increased with age ( $P = 0.003$  and  $P < 0.001$ , respectively). However, multivariate analysis showed that age did not significantly influence the presence of UI in men. The most reported form of UI in women was stress UI, followed by mixed UI (26.3% and 10.0%, respectively). The most common type of UI among men was the aforementioned 'any other type of UI'. This amounted to 11.7%, while urge UI was the second most common type. In men younger than 40 years of age, we found that stress UI was more frequent than urge UI (4.7% versus 2.3%, respectively).

#### **Children**

In children the total prevalence was 21.7%, where stress UI was the most frequent form of UI (8.8%). Similarly to the adults, girls experienced UI significantly more often than boys (30.1% vs. 14.2% respectively,  $P = 0.003$ ). However, the prevalence of UI did not change with age. The prevalence between the younger (8 - 12 years old) and older (13 - 17 years old) group was similar, 21.5% and 21.8% respectively,  $P = 0.962$ . Enuresis nocturna without daytime UI was reported by 4 children (1.7%). Combined day and night UI was seen in 3 children (1.2%).

#### **Risk factors**

In adults we established that diabetes mellitus, fecal incontinence, constipation and experiencing other lower urinary tract symptoms were risk factors for UI. In women, obesity, vaginal hysterectomies, and vaginal parturition were also risk factors for UI, as was prostate surgery in men.

In the group of children univariate analysis showed that the presence of straining, intermittency, nocturia or fecal incontinence was significantly associated with urinary incontinence.

### Interpretation of results

Urinary incontinence is a common condition in the Netherlands with a prevalence of 36.8% in adults and 21.7% in children. Women and girls especially, are affected by this problem (49% and 30.1% respectively). Importantly, UI in men should not be underestimated, because 22.6% of men living in the Netherlands experiences UI as well. Our findings therefore negate the current prejudice that UI is a female ailment.

Using multivariate analysis, we found that age was a significant risk factor in women only. It seems that age, as a single factor, influences UI in both men and women, but in combination with other age-associated diseases, it only correlated with UI in women. The reasons for these finding are unclear, but because men and women often experience different types of UI, and different types of UI possibly have different causative factors, this could explain why age influences UI differently in men and women.

It is remarkable that in children there is no difference between the prevalence of UI in the two age groups. This means that there is no such thing as 'outgrowing UI'.

On the basis of the findings of this study, we are able to confirm that in adult men and women in the Netherlands, lower urinary tract symptoms are correlated with UI – according to both univariate and multivariate analyses. We also showed that obesity is a risk factor for UI in women, not in men. We found a significant correlation between a BMI of > 30 and UI, even after correcting for age and diabetes.

Finally, we found that vaginal parturition as well as the number of vaginal parturitions were risk factors for UI, while cesarean sections were not. Our finding indicates that not pregnancies, but the type of delivery and the number of parturitions are risk factors for UI. Vaginal hysterectomies increased the risk of being incontinent for urine, while abdominal hysterectomies did not. It is plausible that vaginal hysterectomies are more often performed in women with pre-existing UI. Additionally a surgeon may choose the vaginal approach more frequently in parous women, because this is easier to perform in parous than in nulliparous women.

In children the presence of lower urinary tract symptoms, especially straining, intermittency and nocturia were risk factors for experiencing UI.

#### Concluding message

The prevalence of urinary incontinence in the Netherlands is high. The risk factors associated with UI are different for men and women, and also for children and adults. It is important for medical practitioners to not underestimate the magnitude of this problem and to be aware of the associated risk factors.

#### References

1. Statistics Netherlands. Population key figures. Available at: [http:// www.cbs.nl/en-GB/menu/cijfers/kerncijfers/default.htm](http://www.cbs.nl/en-GB/menu/cijfers/kerncijfers/default.htm). Accessed November/16, 2015.
2. WHO. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. WHO Tech Rep Ser. 2000;894:i–xii, 1–253.

#### Disclosures

**Funding:** Nothing do disclose **Clinical Trial:** No **Subjects:** HUMAN **Ethics not Req'd:** the participant of this study weren't subject to any procedures or required to follow rules of behaviour. **Helsinki:** Yes **Informed Consent:** Yes