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Prevalence of Female Urinary Incontinence in the General Population According to Different Definitions and Study Designs

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Abstract

Background: Estimates of the prevalence of female urinary incontinence (UI) vary widely.

Objective: To estimate UI prevalence among women in France using data from five national surveys and analyse prevalence differences among the surveys according to their design (representative sample or not, survey focused on UI or not) and UI definition (based on symptoms or disease perception).

Design, setting, and participants: Data came from two representative telephone surveys, Fecond (5017 women aged 15–49 yr) and Barometer (3089 women aged 40–85 yr), general and urinary postal surveys of the GAZEL cohort (3098 women aged 54–69 yr), and the web-based NutriNet survey (85 037 women aged 18–87 yr).

Outcome measurements and statistical analysis: Definitions of UI based on the International Conference on Incontinence Questionnaire UI short form (ICIQ-UI-SF) and on a list of health problems were considered. We compared age-adjusted prevalence rates among studies via logistic regression and generalised linear models.

Results and limitations: Overall, 13% of the women in Fecond, 24% in Barometer, 15% in the GAZEL general survey, 39% in the GAZEL urinary survey, and 1.5% in the NutriNet survey reported any UI. Prevalence rates in representative samples with the same UI definition (ICIQ-UI-SF) were concordant. UI prevalence in the representative samples was 17%. The estimated number of women in France with UI was 5.35 million (95% confidence interval [CI] 5.34–5.36 million) for any UI and 1.54 million (95% CI 1.53–1.55 million) for daily UI. For the GAZEL sample, UI prevalence was lower but UI severity was greater for responses to a questionnaire with the list-based UI definition rather than to a questionnaire with the ICIQ-UI-SF-based definition. In all surveys, information about UI was self-reported and was not validated by objective measurements.

Conclusions: UI definitions and sampling strategies influence estimates of UI prevalence among women. Precise estimates of UI prevalence should be based on non-UI-focused surveys among representative samples and using a validated standardised symptom-based questionnaire.

Patient summary: We looked at estimates of urinary incontinence (UI) prevalence in studies with different designs and different UI definitions in a large population of French women. We found that estimates varied with the definition and the design. We conclude that the most precise estimates of UI prevalence are obtained in studies of representative populations that are not focused on UI and use a validated international standard questionnaire with sufficient details to allow grading of UI severity. Most women reported rare urine leakages involving small amounts of urine with little impact on their quality of life.

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1. Introduction

Estimation of the prevalence of urinary incontinence (UI) in the general population remains a challenge, as shown by available studies, which report UI prevalence rates between 5% and 69% in women [1–3]. There are probably multiple reasons for this variability across studies.

Much of the research on UI prevalence has been performed among nonrepresentative samples comprising older women and/or clinical samples [4–6]. Another reason for the variability of UI prevalence in epidemiological studies may be the variety of definitions [7]. One way that UI is identified is through questionnaires that ask for details about the frequency of urine leakages, that is, a symptom-based definition. The International Conference on Incontinence Questionnaire UI short form (ICIQ-UI-SF) was developed with a symptom-based approach [8]. Another way to identify diseases in epidemiological studies is through a yes/no question with a list of common diseases proposed to participants: those who perceive themselves to have a disease tick the relevant item. This can be considered a perception-based definition.

UI prevalence among women in France has been measured mainly for clinical or other nonrepresentative samples or in studies with low response rates or non-standardised definitions (Supplementary Table 1) [4,9–16].

The main aims of our work were (1) to estimate and compare the prevalence of UI in France according to a validated international standard questionnaire, the ICIQ-UI-SF, for two population-based representative samples, and (2) to analyse differences in UI prevalence among studies according to their design, including the sample characteristics (representative or not), the survey aim (general health or UI-focused), and UI definition. We compared studies that used (1) the same design and same UI definition, (2) different designs and the same definition, and (3) different UI definitions for the same sample. We hypothesised that estimated prevalence would be higher in UI-focused surveys and when using a symptom-based rather than a perception-based definition.

2. Patients and methods

2.1. Sampling design

We obtained data from five surveys in four French national samples: two representative population-based telephone surveys, Fecond and the National Health Barometer 2010 (hereafter called Barometer); two postal surveys for the GAZEL cohort, one general and one focused on urinary problems (hereafter called GAZEL-G and GAZEL-U); and a web-based survey of adult volunteers NutriNet-Santé (hereafter called NutriNet). These studies were chosen because of data availability, the study period, and the inclusion of questions about UI.

The survey protocol for Fecond and Barometer were very similar; both were nationwide health surveys with two-stage (household and individual) random sampling, and interviews were conducted via a computer-assisted telephone interview system. The objective of Fecond was to analyse practices related to sexual and reproductive health in a representative sample of men and women aged 15–49 yr in 2010 [17]. Barometer is a survey by the National Institute of Prevention and Health

Education to analyse health behaviours in a random representative sample of the population aged 15–85 yr [18]. For Fecond the rate of participation refusal was 31% in the landline sample and 37% in the mobile sample [17], while the refusal rate for Barometer was 39% for both [18]. We used data from all women who were asked about urine leakage, comprising all women in Fecond (15–49 yr; $n = 5030$; weighted $n = 5017$) and women aged 40–85 yr in Barometer ($n = 3432$; weighted $n = 3089$). The samples were weighted to be representative of the general French population, taking into account sex, age groups, municipality of residence and its size, education level, and the number of persons per household.

GAZEL (www.gazel.inserm.fr) is an ongoing project established in 1989 [9,19]. We used data from the annual postal general questionnaire sent in 2008 to all participants (GAZEL-G, response rate 70.4%) and from a specific questionnaire focused on urinary problems sent in 2008 (GAZEL-U, response rate 82%); 3098 women aged 54–69 yr responded to both questionnaires and were included in our analysis.

NutriNet (www.etude-nutrinet-sante.fr) is a nationwide web-based survey focused on nutrition and health [20,21]; it began in 2009 and was open to all volunteers aged 18 yr and older. The study design made it impractical to estimate the response rate. Data from 85 037 women aged 18–87 yr were available for 2011.

2.2. Ethics

All surveys were approved by the French Data Protection Authority (Commission Nationale Informatique et Liberté) [16–21]. All subjects provided informed consent or its equivalent.

2.3. Outcomes

The symptom-based definition was from the ICIQ-UI-SF questionnaire, included in the Fecond, Barometer, and GAZEL-U surveys. Women who reported any leakage of urine were coded as incontinent (any UI). If women did not answer this question, their data were considered to be missing (242 in Fecond, 29 in Barometer, 122 in GAZEL) and were excluded. We distinguished participants who reported daily leakage from those reporting weekly leakage.

The perception-based definition, whereby a list of health problems in the last 12 mo included one item, either “involuntary loss of urine” or “urinary incontinence, urinary leakages”, was used for all participants in the annual GAZEL-G questionnaire and in the NutriNet health questionnaire. This definition resulted in no missing data.

2.4. Statistical methods

The UI prevalence rate was described for 5-yr age groups, taking into account only binary information on incontinence. For women in the same age group of the representative samples (ie, 40–49 yr) we compared the prevalence of any UI, daily UI, and weekly UI between Fecond and Barometer using the Rao-Scott χ^2 test [22] to determine whether these representative samples produced significantly different UI prevalence estimates. We also compared UI prevalence between landline and mobile samples using a χ^2 test for the women in the representative samples.

To estimate the female French population with any UI, daily UI, and weekly UI, we applied the age-standardised UI prevalence rate from the pooled Fecond and Barometer data to the French female population observed in 2010 according to Institut National de la Statistique et des Études Économiques [23].

To analyse differences in UI prevalence among studies according to their design, we first assessed the association (odds ratio, OR) between any UI and age (in years) for each study using a logistic regression model. We performed a test for homogeneity of the age effect across the

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