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Female urinary incontinence in middle-aged women in four hospitals in Northern Italy: A multicentre prevalence study ☆

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ABSTRACT

Urinary Incontinence (UI) has been identified as a health priority by the World Health Organization. Despite being a widely discussed topic, UI remains an underrecognized condition: affected individuals often refrain from reporting it due to its status as a socially sensitive topic and a source of embarrassment. UI exhibits a markedly higher prevalence in the female population compared to males and significantly diminishes the quality of life for those affected. It impacts various personal, relational, and social domains in which women aged 40–65 years are often actively engaged. Moreover, the most recent Italian prevalence publications date back to the early 2000s. Consequently, an observational study focused on UI in Italy could provide valuable insights. This paper outlines a protocol designed to investigate the point prevalence, risk factors, quality of life, social impact and economic burden of UI in female patients, caregivers, healthcare and administrative workers aged 40–65 years across four hospitals in Northern Italy using a survey (UI SURVEY) and two questionnaires validated in Italian (ICIQ UI-SF and IIQ-7). The findings of this study could also inform nursing and midwifery practices in the management of women affected by UI.

Specifications table

Subject area:	Medicine and Dentistry
More specific subject area:	Female Urinary Incontinence; Research in healthcare; Prevalence and risk factors mapping; Personalized health assessment.
Name of your protocol:	Female Urinary Incontinence in Middle-Aged Women in four hospitals in Northern Italy: a multicentre prevalence study.
Reagents/tools:	Instruments used for data collection: - Urinary Incontinence (UI) SURVEY; - Italian version of the International Consultation of Incontinence Modular Questionnaire Urinary Incontinence-Short Form (ICIQ UI-SF); - Italian version of the Incontinence Impact Questionnaire-7 (IIQ-7).

(*continued on next page*)

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Experimental design:	A multicentre, cross-sectional prevalence study will be conducted involving a sample of female patients, caregivers and healthcare/administrative workers aged 40–65 years from four hospitals in Northern Italy. Data will be collected at a single point in time using the UI SURVEY and two Italian-validated questionnaires (ICIQ UI-SF and IIQ-7).
Trial registration:	This study protocol has been registered on Clinicaltrials.gov under the identifier NCT06291441.
Ethics:	This protocol was submitted to the Lombardia 1 Territorial Ethics Committee under number CET 29-2024 and received approval on January 24th, 2024. This study will be conducted in accordance with the Declaration of Helsinki and the ICH Good Clinical Practice standards. All participants will voluntarily provide informed consent after receiving a comprehensive explanation of the study's objectives and procedures. They will be given the opportunity to ask questions and seek clarification before signing the informed consent form. Each participant will receive a copy of the signed and dated informed consent form. The decision to decline participation will not affect the individual's future care.
Value of the Protocol:	This protocol is essential for: - investigating the point prevalence, risk factors, quality of life, social impact and costs of UI in a sample of women aged 40–65 years in Northern Italy; - guiding healthcare professionals in the management of women affected by UI; - Establishing the distribution of UI to project the need for healthcare services.

Background

Urinary incontinence (UI) is defined as the involuntary leakage of urine from the bladder [1]. UI can be classified into three primary subtypes: stress UI (SUI), urge UI (UUI) and mixed UI (MUI) [2]. The World Health Organization has identified UI as a health priority [3], highlighting that the prevalence of this condition and its associated burden are expected to rise over time.

Globally, it is estimated that 21.5 % of adults suffers from at least one form of UI [4], with a markedly higher prevalence among females compared to males. UI affects nearly 50 % of adult women and its prevalence increases with age [5–7]. Women also tend to experience more severe symptoms than men [8]. Recent data on the Italian epidemiology of UI indicate a prevalence of 8.7 %, with 5 million individuals affected, including 3 million women [9]. Despite being a widely discussed topic, UI is a globally underestimated condition: affected people tend not to report this problem, as it can be considered a taboo and a source of shame and embarrassment [10].

Moreover, UI has a notably adverse effect on the quality of life and the physical, psychological and financial wellbeing of those affected [3,11]. In fact, it influences numerous personal, relational and social aspects - in which women aged 40 to 65 years are actively engaged - such as work, family/friends relationships, hobbies/leisure activities, physical activity, travel, sexual function, self-perception/self-esteem and money availability [3,11]. Studies have shown that women with UI utilize more medical resources and incur higher costs compared to those without this condition [12].

Furthermore, epidemiological research on UI in Italy is limited, with existing studies primarily conducted in the early 2000s and lacking specificity in gender and/or age [13–15]. This underscores the importance of investigating UI in depth, especially among women aged 40–65 years. A focused prevalence study in Italy could provide valuable insights and inform nursing and midwifery practices in the management of women affected by UI.

Description of protocol

Objective

Primary objective

This study aims to:

- Investigate the point prevalence of UI among female patients, caregivers and healthcare/administrative workers aged 40–65 years from four hospitals in Northern Italy.

Secondary objectives

This study also aims to:

- Examine the risk factors, quality of life, social impact and costs of UI within the same sample.
- Describe the association between UI and its related risk factors, quality of life, social impact and costs.

Study design

To achieve these objectives, a multicentre, cross-sectional prevalence study will be conducted, adhering to the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) Checklist [16].

Study sample

The study will be conducted on a sample of female patients, caregivers and healthcare/administrative workers aged 40 to 65 years from four hospitals in Northern Italy. Participants will be recruited from the following centers: San Raffaele Hospital (MI), San Raffaele Turro Hospital (MI), Zingonia San Marco Policlinic (BG) and San Pietro Policlinic (BG).

Inclusion/exclusion criteria

Inclusion criteria

- Female gender;
- Aged 40–65 years;
- Willing to voluntarily provide written informed consent;
- Able to understand written and spoken Italian;
- Outpatients of any hospital unit (including outpatient clinic, day surgery and day hospital patients) or caregivers or healthcare/administrative workers at the four participating hospitals.

Exclusion criteria

- Male gender;
- Aged younger than 40 or older than 65 years;
- Currently pregnant;
- Currently in the puerperium period (up to 40 days postpartum).

Participant's' recruitment

Two recruitment strategies have been devised:

- Recruitment of Healthcare/Administrative Workers: One week prior to data collection, an introductory email will be sent to the healthcare and administrative staff of the four participating hospitals to present the study. A follow-up email will include a link to the online survey and questionnaires on the Google Forms platform. This email will be distributed to all workers, specifying that only women aged 40–65 years who meet the inclusion criteria should complete the survey. Participants will be required to agree to a privacy policy and provide electronic informed consent before accessing the survey.
- Recruitment of Female Patients and Caregivers: Female patients and caregivers will be recruited at the central and at the private insurance admissions of the four hospitals. Inclusion and exclusion criteria will be assessed during a brief preliminary interview conducted by a member of the research teams. This interview will collect information on age and pregnancy/puerperium status. Participants will be given paper forms containing the survey and questionnaires, each marked with a unique identification number. After signing the informed consent form and agreeing to the privacy policy, participants will be asked to complete the questionnaires voluntarily and anonymously and return the completed forms to the researchers.

Data collection and management

Data will be collected based on a series of variables identified through a comprehensive narrative review of UI risk factors, quality of life, social impact and costs. These variables are described in Table 1.

The research team will be responsible for data management, control and quality assurance. Collected data will be anonymized and manually entered into the electronic Case Report Form (eCRF) using Microsoft Forms. In each participating hospital, a designated nurse will act as the contact person, overseeing the accurate recording of data and ensuring adherence to the research protocol. Data will be collected using three instruments: UI SURVEY, ICIQ UI-SF and IIQ-7. Detailed descriptions of these instruments can be found in Supplementary Material 1.

UI survey

A survey, originally developed in Italian by the authors, will be administered to collect women's socio-demographic, economic and clinical characteristics. The survey is based on a narrative review of the relevant literature. It includes 29 questions: items 1–23 focus on socio-demographic and clinical risk factors for UI, question 35 explores the onset of UI symptomatology, question 36 addresses sexuality and items 37–40 assess both the direct and indirect costs associated with UI. The survey was pilot-tested on a sample of 13 women aged 40 to 65 years and deemed appropriate for data collection: the questions were clear, comprehensible and did not cause discomfort to the participants. The average completion time was approximately 5 min.

International consultation of incontinence modular questionnaire urinary incontinence short form (ICIQ UI-SF)

The ICIQ UI-SF is a validated instrument designed to assess the prevalence, frequency, perceived causes of UI and its impact on daily life [29]. Initially developed and validated in English in 2004 [29], it was later validated in Italian in 2006 [34] and the Italian version will be utilized in this study. The questionnaire consists of four questions referring to the last four weeks. The total score is calculated as the sum of the scores from three specific questions: frequency of UI episodes (ranging from 0 or 'never' to 5 or 'always', increasing by 1 unit), perceived volume of urine loss (ranging from 0 or 'no loss' to 6 or 'a large amount', increasing by 2 units) and the impact on quality of life (ranging from 0 or 'no interference' to 10 or 'maximum interference', increasing by 1 unit). The

Table 1
Outcomes and description of investigated variables.

Outcome	Variable	Description
UI predictors	Age	UI prevalence appears to increase with advancing age [7].
	Ethnicity	Risk of SUI appears to be lower in Black and Asian-American women compared to White women [17,18].
	Scholarship	Increased level of education is associated with UI reduction [11,19].
	Body Mass Index (BMI)	Prevalence of UUI and SUI increases proportionately with BMI [20].
	Comorbidities	Lower urinary tract symptoms are associated with multiple conditions, including [11,20–22]: • cardiac failure; • chronic renal failure; • chronic obstructive pulmonary disease (COPD); • diabetes mellitus; • hypertension; • metabolic syndrome; • pelvic organs prolapse (POP); • urinary tract infections (UTI); • bowel disorders (constipation and irritable bowel syndrome); • sleep problems; • depression; • neurological diseases; • general cognitive impairment.
	Pelvic or uro-gynecological surgery	Previous pelvic or uro-gynecological surgery are positively associated with SUI [20,23].
	Menopause	Menopausal status appears to influence the onset and characteristics of urine leakage [22,24].
	Parity	Pregnancy and childbirth are triggers for SUI [14,25].
	Lifestyle factors	• Unhealthy voiding behaviors [26] and low physical activity may contribute to the onset of UUI [25]; • Smoking cessation is weakly associated with improvements in urgency and UI frequency [17,20]; • A reduction in fluid intake may alleviate symptoms in patients with SUI and idiopathic detrusor overactivity [27]; • Decreasing caffeine intake may reduce urgency and UI frequency [20]; • Alcohol consumption is associated with UI [28].
UI prevalence and symptomatology	Frequency of urine leakage	To assess the severity of UI in women, it is necessary to measure the “frequency” and “usual amount” of leakage, which can range from “moderate” to “severe” [29].
	Perceived quantity of urine leakage	
	Type of urine leakage	Focused on UI subtypes (SUI, UUI and MUI) [2].
	Time of onset of urine leakage	The mean age in which urine leakage begins seems to be lower for SUI compared to MUI and UUI [24].
UI quality of life, social impact	General interference with daily life	The assessment of UI should include an evaluation of the condition’s impact on quality of life [29].
	Interference with specific activities [5,30]	• Physical Activity; • Social Relationships; • Travel; • Emotional Health;
	Interference with sexual life	Some studies report that UI affects sexual aspects of affected individuals [19,31]. According to other studies, sexual activity does not seem to be influenced by UI [13].
Costs	Work productivity	UI imposes a significant economic burden due to losses in work productivity [32].
	Weekly costs of hygiene care products	UI is associated with substantial costs for routine care [33].
	Healthcare resource utilization: 1. Specialist visits 2. Treatments	Women with SUI/MUI use more medical resources and incur higher costs compared to women without SUI/MUI [12].

total score ranges from 0 to 21, where a higher score reflects a greater degree of impairment due to UI. The fourth question is a self-diagnostic item on the type of urine leakage, which is not included in the scoring [34]. The instrument has been awarded a GRADE A for validation by the International Consultation of Incontinence (ICI), indicating robust validity, reliability and responsiveness established across multiple datasets. Specifically, the internal consistency of the ICIQ-SF is overall satisfactory, with a Cronbach’s α of 0.896. The test-retest reliability is also strong, with a Pearson correlation coefficient nearing 1 for the total score and remaining consistently around 0.9 across all items. The intraclass correlation coefficients (ICC) for the total score and the quality-of-life item are 0.93 and 0.96, respectively [34].

Incontinence impact questionnaire-7 (IIQ-7)

The IIQ-7 is a self-administered, seven-item questionnaire designed to assess the perceived impact of UI on daily activities, interpersonal relationships and emotional wellbeing [30]. In this study, the Italian version of the IIQ-7 will be used to evaluate the impact of UI on women’s quality of life [35]. According to the original authors, this instrument covers four domains (questions n. 28 - 34): physical activity (items 1 and 2), travel (items 3 and 4), social activities (item 5) and emotional health (items 6 and 7). Each

item is rated on a four-point Likert scale (0 = not at all; 1 = slightly; 2 = moderately; 3 = greatly). The average of the item scores is calculated and multiplied by 33 1/3 to convert the result to a scale ranging from 0 to 100, with higher score indicates more severe symptoms and a lower quality of life [35]. Overall, the Italian version of the IIQ-7 shows acceptable basic psychometric properties: the average time for completion is approximately 4 min, with a Cronbach's α of 0.88, indicating good internal consistency. Item-scale correlations exceed 0.66, while item-rest correlation coefficients range from 0.53 (item 1 "Household chores") to 0.70 (item 4 "Travel > 30 min away from home"). Test-retest reliability is excellent, with an intraclass correlation coefficient (ICC 2.1) of 0.92 and a 95 % confidence interval of 0.88–0.94. The Standard Error of Measurement (SEM) and Minimum Detectable Change at 95 % confidence (MDC95) are 6.5 and 18.1 points, respectively [35].

Sample size

As this is a point prevalence study, the sample size cannot be determined precisely in advance. To estimate an indicative sample size for this research, reference will be made to two prevalence studies conducted in specific Italian regions. The first study involved a sample of 2.767 women aged ≥ 40 years residing in six Italian cities [14]. The second study examined the prevalence and characteristics of UI in a sample of 2.900 women aged 18–49 years living in the urban area of Trieste [13]. Additionally, the General Directions of all participating hospitals will be asked to provide estimates of (i) the daily number of patients/caregivers accessing general and private insurance admissions, and (ii) the number of healthcare and administrative personnel.

Potential risks

No risks are associated with participation in the study or the procedures involved.

Risk of bias

The protocol is subject to the following risks of bias:

- "Recall bias", which may arise when participants do not accurately or completely recall part events or experiences [36]. Such bias could affect the completion of the ICIQ UI-SF questionnaire, as its questions require participants to reflect on events or experiences that occurred within the previous four weeks [34].
- "Underreporting bias", which occurs when participants tend to withhold or underreport available information [36]. In this protocol, underreporting may stem from the fact that UI often causes embarrassment, leading affected individuals to avoid discussing their condition openly [10].

To mitigate this bias and maintain the study's quality, the research team utilized a bias risk assessment tool during the protocol development. This tool is based on the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) and Cochrane methodologies [37].

Statistical analysis

Descriptive and position analyses (mean, median, standard deviation and interquartile range) will be performed to summarize quantitative variables. Categorical variables will be analyzed using linear models. Classification or stratification techniques (multivariate statistics) will be applied to identify participants' profiles. All statistical analyses will be conducted using SPSS Version 26 (IBM, Armonk, NY, USA).

Ethical aspects

This study will be conducted in accordance with the Declaration of Helsinki and the ICH Good Clinical Practice standards. This protocol was submitted to the Lombardia 1 Territorial Ethics Committee under reference number CET 29–2024 and received approval on January 24th, 2024. Any amendments or updated versions of the protocol will be promptly communicated to the relevant Ethics Committee.

All participants will voluntarily sign an informed consent form after receiving a detailed explanation of the study's objectives and procedures, with ample opportunity to ask questions or clarify any concerns. Each participant will be provided with a dated copy of the informed consent form. Declining to participate in the study will not affect the individual's future medical care.

Data confidentiality and privacy

Data will be handled in accordance with Italian law, specifically Legislative Decree 30 June 2003, n. 196, "Code regarding the protection of personal data" (Official Gazette n. 174 of 29 July 2003 - Ordinary Supplement n. 123) and in compliance with the European General Data Protection Regulation (GDPR) n. 679/2016. All collected data will be anonymized and cannot be traced back to individual participants. Data gathered during the study will be processed solely for the scientific purposes outlined in the protocol. The data will not be published on an individual basis but will be used exclusively in aggregate form for descriptive analysis. The investigators will ensure the confidentiality of the participants by assigning identification numbers and no personal identifying information will be collected. All study documents will be securely stored at San Raffaele Hospital (MI) and will be accessible only to the investigators or authorized personnel. Personal data of the participants are not relevant to this study.

Protocol validation

This protocol outlines a pioneering study poised to make significant contributions to scientific research on UI risk factors among women aged 40–65 years. Currently, there is limited epidemiological research on this topic in Italy. Existing literature primarily consists of studies from the early 2000s, which are not gender or age-specific [13–15]. The data collected in this study will enhance understanding of the point prevalence, risk factors, quality of life, social impact and costs associated with UI in a sample of women aged 40 to 65 years in Northern Italy. Additionally, the findings from this research will assist healthcare professionals in managing care for women affected by UI and in projecting the need for healthcare services.

Data on the point prevalence, risk factors, quality of life, social impact and costs of UI will be gathered using a UI SURVEY - developed by the research team following a literature review on UI specific risk factors - and two validated Italian questionnaires: the ICIQ UI-SF [34] and the IIQ-7 [35].

Limitations

Participants will be enrolled through convenience sampling, specifically targeting 40–65-year-old female patients, caregivers and healthcare/administrative workers from four hospitals in Northern Italy (which are the reference centres for the research team). This approach may introduce selection bias, as the sample is limited to a specific geographic region and demographic group, potentially reducing the generalizability of the findings to broader populations. Since the study follows a cross-sectional design, it captures data at a single point in time, limiting the ability to assess changes over time or infer causality. Moreover, reliance on self-reported questionnaires introduces the risk of response bias, including recall bias and underreporting bias [36]. Lastly, all collected data will be manually entered into the eCRF software Microsoft Forms, which introduces the potential for human errors during data entry.

To mitigate these risks and ensure the quality of the study, the research team employed a bias risk assessment tool during the protocol development. This tool is based on the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) and Cochrane methodologies [37]. Although the use of GRADE and Cochrane methods aims to minimize bias, it is important to acknowledge that some unmeasured biases may still impact the study's results.

Supplementary material and/or additional information

Supplementary Material 1 includes the questionnaires to be used for data collection: the UI SURVEY, ICIQ UI-SF and IIQ-7.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

Sara Trapani: Conceptualization, Methodology, Software, Data curation, Writing – original draft. **Giada De Angeli:** Conceptualization, Methodology, Data curation, Writing – original draft. **Giulia Villa:** Conceptualization, Methodology, Software, Data curation, Visualization, Supervision. **Elisabetta Bagnato:** Conceptualization, Methodology, Data curation, Visualization, Supervision. **Martina Caglioni:** Visualization, Supervision. **Stefania Rinaldi:** Visualization, Supervision. **Stefano Salvatore:** Visualization, Supervision. **Massimo Candiani:** Visualization, Supervision. **Duilio Fiorenzo Manara:** Conceptualization, Methodology, Visualization, Supervision.

Data availability

No data was used for the research described in the article.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.mex.2024.102987.

References

[1] B.T. Haylen, et al., An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction, Int. Urogynecol. J. 21 (1) (2010) 5–26 Jan, doi:10.1007/s00192-009-0976-9.

[2] P. Abrams, et al., The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society, Urology 61 (1) (2003) 37–49 Jan, doi:10.1016/S0090-4295(02)02243-4.

[3] Y.N. Parpio, A. Minaz, S.I. Haider, Urinary incontinence: understanding the silent plight of women, J. Coll. Physicians Surg. Pak. 32 (4) (2022) 519–521 Apr, doi:10.29271/jcpsp.2022.04.519.

[4] D.E. Irwin, Z.S. Kopp, B. Agatep, I. Milsom, P. Abrams, Worldwide prevalence estimates of lower urinary tract symptoms, overactive bladder, urinary incontinence and bladder outlet obstruction, BJU Int. 108 (7) (2011) 1132–1138 Oct, doi:10.1111/j.1464-410X.2010.09993.x.

[5] M. Monticone, G. Ferriero, A. Giordano, C. Foti, F. Franchignoni, Rasch analysis of the Incontinence Impact Questionnaire short version (IIQ-7) in women with urinary incontinence, Int. J. Rehabil. Res. 43 (3) (2020) 261–265 Sep, doi:10.1097/MRR.0000000000000422.

[6] A.D. Markland, H.E. Richter, C.W. Fwu, P. Eggers, J.W. Kusek, Prevalence and trends of urinary incontinence in adults in the United States, 2001 to 2008, J. Urol. 186 (2) (2011) 589–593 Aug, doi:10.1016/j.juro.2011.03.114.

[7] I. Milsom, M. Gyhagen, The prevalence of urinary incontinence, Climacteric 22 (3) (2019) 217–222 Jun, doi:10.1080/13697137.2018.1543263.

[8] E. Aslan, N.K. Beji, H.A. Erkan, O. Yalcin, F. Gungor, Urinary incontinence (UI) and quality of life (QoL) of the elderly residing in residential homes in Turkey, Arch. Gerontol. Geriatr. 49 (2) (2009) 304–310 Oct, doi:10.1016/j.archger.2008.10.009.

[9] FINCOPP, "Federazione Italiana incontinenti e disfunzioni del pavimento pelvico (FINCOPP)," 2022.

[10] K. Elenskaia, K. Haidvogel, C. Heidinger, D. Doerfler, W. Umek, E. Hanzal, The greatest taboo: urinary incontinence as a source of shame and embarrassment, Wien. Klin. Wochenschr. 123 (19–20) (2011) 607–610 Oct, doi:10.1007/s00508-011-0013-0.

[11] S. Batmani, R. Jalali, M. Mohammadi, S. Bokaee, Prevalence and factors related to urinary incontinence in older adults women worldwide: a comprehensive systematic review and meta-analysis of observational studies, BMC Geriatr. 21 (1) (2021) 212 Mar, doi:10.1186/s12877-021-02135-8.

[12] M. Datar, L.C. Pan, J.L. McKinney, T.F. Goss, S.J. Pulliam, Healthcare resource use and cost burden of urinary incontinence to United States payers, Neurourol. Urodyn. 41 (7) (2022) 1553–1562 Sep, doi:10.1002/nau.24989.

[13] S. Siracusano, et al., Prevalence of urinary incontinence in young and middle-aged women in an Italian urban area, Eur. J. Obstet. Gynecol. Reprod. Biol. 107 (2) (2003) 201–204 Apr, doi:10.1016/s0301-2115(02)00407-4.

[14] A. Bortolotti, et al., Prevalence and risk factors for urinary incontinence in Italy, Eur. Urol. 37 (1) (2000) 30–35 Jan, doi:10.1159/000020096.

[15] F. Parazzini, M. Lavezzari, W. Arbitani, Prevalence of overactive bladder and urinary incontinence, J. Fam. Pract. 51 (12) (2002) 1072–1075 Dec.

[16] J.P. Vandenbroucke, et al., Strengthening the Reporting of Observational Studies in Epidemiology (STROBE): explanation and elaboration, PLoS Med. 4 (10) (2007) e297 Oct, doi:10.1371/journal.pmed.0040297.

[17] K.N. Danforth, M.K. Townsend, K. Lifford, G.C. Curhan, N.M. Resnick, F. Grodstein, Risk factors for urinary incontinence among middle-aged women, Am. J. Obstet. Gynecol. 194 (2) (2006) 339–345 Feb, doi:10.1016/j.ajog.2005.07.051.

[18] D.H. Thom, et al., Differences in prevalence of urinary incontinence by race/ethnicity, J. Urol. 175 (1) (2006) 259–264 Jan, doi:10.1016/S0022-5347(05)00039-X.

[19] L.P. Marques, I.J.C. Schneider, M.W.C. Giehl, D.L. Antes, E. d'Orsi, Demographic, health conditions, and lifestyle factors associated with urinary incontinence in elderly from Florianópolis, Santa Catarina, Brazil, Rev. Bras. Epidemiol. 18 (3) (2015) 595–606 Sep, doi:10.1590/1980-5497201500030006.

[20] European Association of Urology (EAU), "EAU guidelines on management of non-neurogenic female lower urinary tract symptoms.," 2023.

[21] J. Wang, et al., Pelvic floor disorders and quality of life in women with self-reported irritable bowel syndrome, Aliment. Pharmacol. Ther. 31 (3) (2010) 424–431 Feb, doi:10.1111/j.1365-2036.2009.04180.x.

[22] N. Sensoy, N. Dogan, B. Ozek, L. Karaaslan, Urinary incontinence in women: prevalence rates, risk factors and impact on quality of life, Pak. J. Med. Sci. 29 (3) (2013) 818–822 May, doi:10.12669/pjms.293.3404.

[23] M.A.E. Engh, L. Otterlind, J.H. Stjerndahl, M. Löfgren, Hysterectomy and incontinence: a study from the Swedish national register for gynecological surgery, Acta Obstet. Gynecol. Scand. 85 (5) (2006) 614–618, doi:10.1080/00016340600555942.

[24] F. Thangarajah, et al., The onset of urinary incontinence in different subgroups and its relation to menopausal status: a hospital-based study, In Vivo 34 (2) (2020) 923–928 Apr, doi:10.21873/invivo.11859.

[25] Q. Li, Y. Cheng, H. Shi, K. Xue, F. Zhou, Advances in the natural history of urinary incontinence in adult females, J. Obstet. Gynaecol. 43 (1) (2023) 2171774 Dec., doi:10.1080/01443615.2023.2171774.

[26] J.S. Hu, E.F. Pierre, Urinary incontinence in women: evaluation and management, Am. Fam. Physician 100 (6) (2019) 339–348 Sep.

[27] L. Swithinbank, H. Hashim, P. Abrams, The effect of fluid intake on urinary symptoms in women, J. Urol. 174 (1) (2005) 187–189 Jul, doi:10.1097/01.ju.0000162020.10447.31.

[28] A.H. Lee, F. Hirayama, Alcohol consumption and female urinary incontinence: a community-based study in Japan, Int. J. Urol. 19 (2) (2012) 143–148 Feb, doi:10.1111/j.1442-2042.2011.02889.x.

[29] K. Avery, J. Donovan, T.J. Peters, C. Shaw, M. Gotoh, P. Abrams, ICIQ: a brief and robust measure for evaluating the symptoms and impact of urinary incontinence, Neurourol. Urodyn. 23 (4) (2004) 322–330, doi:10.1002/nau.20041.

[30] S.A. Shumaker, J.F. Wyman, J.S. Uebersax, D. McClish, J.A. Fantl, Health-related quality of life measures for women with urinary incontinence: the incontinence impact questionnaire and the urogenital distress inventory. Continence Program in Women (CPW) Research group, Qual. Life Res. 3 (5) (1994) 291–306 Oct, doi:10.1007/BF00451721.

[31] K.F. Felsted, K.P. Supiano, Mindfulness-based stress reduction versus a health enhancement program in the treatment of urge urinary incontinence in older adult women: a randomized controlled feasibility study, Res. Gerontol. Nurs. 12 (6) (2019) 285–297 Nov, doi:10.3928/19404921-20190702-02.

[32] A. Goren, K.H. Zou, S. Gupta, C. Chen, Direct and indirect cost of urge urinary incontinence with and without pharmacotherapy, Int. J. Clin. Pract. 68 (3) (2014) 336–348 Mar, doi:10.1111/ijcp.12301.

[33] L.L. Subak, et al., The 'costs' of urinary incontinence for women, Obstet. Gynecol. 107 (4) (2006) 908–916 Apr, doi:10.1097/01.AOG.0000206213.48334.09.

[34] A. Tubaro, et al., Italian validation of the international consultation on incontinence questionnaires, BJU Int. 97 (1) (2006) 101–108 Jan, doi:10.1111/j.1464-410X.2006.05885.x.

[35] M. Monticone, et al., Italian versions of the Urogenital Distress Inventory-6 and Incontinence Impact Questionnaire-7: translation and validation in women with urinary incontinence, Disabil. Rehabil. 43 (20) (2021) 2930–2936 Oct, doi:10.1080/09638288.2020.1720319.

[36] M. Delgado-Rodríguez, J. Llorca, Bias, J. Epidemiol. Community Health 58 (8) (2004) 635–641 Aug, doi:10.1136/jech.2003.008466.

[37] L. Terracciano, J. Brozek, E. Compalati, H. Schünemann, GRADE system: new paradigm, Curr. Opin. Allergy Clin. Immunol. 10 (4) (2010) 377–383 Aug, doi:10.1097/ACI.0b013e32833c148b.