Received: 02 April 2025 / Accepted: 30 August 2025 / Published online: 30 Octoder 2025

DOI 10.34689/SH.2025.27.5.024

UDC 616.62-008.222:614.8.026.1(1-87)

RISK FACTORS AND PREVALENCE OF URINARY INCONTINENCE AMONG WOMEN IN FOREIGN COUNTRIES. LITERATURE REVIEW

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Abstract

Introduction: Urinary incontinence in women is a common medical and social problem affecting the quality of life and increasing with age, especially after menopause. The main risk factors include age, obesity, childbirth, decreased estrogen levels, chronic diseases, and social and behavioral conditions. Despite its high prevalence, the topic remains insufficiently discussed, which leads to a delay in diagnosis and therapy and an aggravation of psychoemotional consequences [8].

Objective: to analyze the literature on the prevalence and risk factors of urinary incontinence in women in foreign countries, as well as to assess the impact of this condition on the quality of life of women.

Search strategy: scientific publications from the past 10 years were reviewed through databases such as Scopus, PubMed, Web of Science, CyberLeninka, among others.

Research results: the analysis showed that urinary incontinence in women occurs in 20-30% of the general population and in more than 35% over the age of 55, with age, hormonal changes, multiple births, obesity and a sedentary lifestyle being the most significant risk factors. A comparative analysis of international data revealed significant differences in prevalence and access to treatment between high- and low-income countries, as well as the impact of cultural and social barriers on access to care. It has been found that urgent and mixed forms of urinary incontinence worsen the quality of life the most, causing anxiety, depression and decreased social activity. The identified gaps — a lack of longitudinal research, poor adaptation of programs to the cultural context, and limited representation of vulnerable groups — highlight the need to create sustainable, culturally sensitive models of women's care.

Conclusions: urinary incontinence in women is a global public health problem that requires an integrated approach. The existing differences in epidemiology, access to diagnosis and treatment, as well as the lack of data on cultural and age characteristics emphasize the need for interdisciplinary and cross-country research. The development of culturally sensitive and evidence-based programs will increase access to care, improve women's quality of life, and reduce the global burden of this condition.

Key words: *women, urinary incontinence in women, risk factors, prevalence; stress urinary incontinence, quality of life.*

For citation:

Ryspayeva Zh. A., Khismetova Z.A. Berikuly D., Serikova-Esengeldina D.S., Kinayatova Sh.K., Sharipova K.K., Ospanova Sh.Kh. Risk factors and prevalence of urinary incontinence among women in foreign countries. Literature review // *Nauka i Zdravookhranenie* [Science & Healthcare]. 2025. Vol.27 (5), pp. 203-213. *doi 10.34689/SH.2025.27.5.024*

Резюме

ФАКТОРЫ РИСКА И РАСПРОСТРАНЕННОСТЬ НЕДЕРЖАНИЯ МОЧИ СРЕДИ ЖЕНЩИН В ЗАРУБЕЖНЫХ СТРАНАХ. ОБЗОР ЛИТЕРАТУРЫ

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Введение: Недержание мочи у женщин - распространённая медицинская и социальная проблема, затрагивающая качество жизни и усиливающаяся с возрастом, особенно после менопаузы. Основные факторы риска включают возраст, ожирение, роды, снижение уровня эстрогена, хронические заболевания и социально-поведенческие условия. Несмотря на высокую распространённость, тема остаётся недостаточно обсуждаемой, что приводит к задержке диагностики и терапии и усугублению психоэмоциональных последствий [8].

Цель исследования: анализ литературы о распространенности и факторах риска недержания мочи у женщин в зарубежных странах, а также оценить влияние этого состояния на качество жизни женщин.

Стратегия поиска: поиск научной литературы в базах данных Scopus, PubMed, Web of Science, CyberLeninka и др., глубиной поиска в 10 лет.

Результаты исследования: анализ показал, что недержание мочи у женщин встречается у 20–30 % в общей популяции и более чем у 35 % старше 55 лет, причём наиболее значимыми факторами риска являются возраст, гормональные изменения, многократные роды, ожирение и малоподвижный образ жизни. Сравнительный анализ международных данных выявил существенные различия в распространённости и доступе к лечению между странами с высоким и низким уровнем дохода, а также влияние культурных и социальных барьеров на обращаемость за помощью. Установлено, что ургентная и смешанная формы недержания мочи сильнее всего ухудшают качество жизни, вызывая тревожность, депрессию и снижение социальной активности. Выявленные пробелы — нехватка лонгитюдных исследований, слабая адаптация программ к культурному контексту и ограниченное представительство уязвимых групп — подчёркивают необходимость создания устойчивых, культурно-чувствительных моделей помощи женщинам.

Выводы: недержание мочи у женщин является глобальной проблемой общественного здоровья, требующей комплексного подхода. Существующие различия в эпидемиологии, доступе к диагностике и лечению, а также недостаток данных о культурных и возрастных особенностях подчеркивают необходимость проведения междисциплинарных и межстрановых исследований. Разработка культурно чувствительных и научно обоснованных программ позволит повысить доступность помощи, улучшить качество жизни женщин и снизить глобальное бремя этого состояния.

Ключевые слова: *женщины, недержание мочи у женщин, факторы риска, распространённость; стрессовое недержание мочи, качество жизни.*

Для цитирования:

Рыспаева Ж.А., Хисметова З. А., Берікұлы Д., Серикова-Есенгельдина Д.С., Кинаятова Ш.К., Шарипова Х.К., Оспанова Ш.Х. Факторы риска и распространенность недержания мочи среди женщин в зарубежных странах. Обзор литературы // Наука и Здравоохранение. 2025. Vol.27 (5), С.203-213. *doi 10.34689/SH.2025.27.5.024*

Түйіндеме

ШЕТ ЕЛДЕРДЕГІ ӘЙЕЛДЕР АРАСЫНДА ЗӘР ШЫҒАРУДЫ ҰСТАМАУДЫҢ ҚАУІП-ҚАТЕР ФАКТОРЛАРЫ МЕН ТАРАЛУЫ. ӘДЕБИЕТТІК ШОЛУ.

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Кіріспе: Әйелдердегі зәрді ұстамау- өмір сапасына әсер ететін және қартайған сайын, әсіресе менопаузадан кейін күшейетін жалпы медициналық және әлеуметтік мәселе. Негізгі қауіп факторларына жас, семіздік, босану, эстроген деңгейінің төмендеуі, созылмалы аурулар және әлеуметтік-мінез-құлық жағдайлары жатады. Жоғары таралуына қарамастан, тақырып жеткілікті түрде талқыланбайды, бұл диагностика мен терапияның кешігуіне және психоэмоционалды салдардың нашарлауына әкеледі [8].

Зерттеудің мақсаты: шет елдердегі әйелдердің зәр шығаруды ұстамаудың таралуы мен қауіп факторлары туралы әдебиеттерді талдау, бұл жағдайдың әйелдердің өмір сапасына әсерін бағалау.

Іздеу стратегиясы: соңғы 10 жыл ішінде жарық көрген ғылыми әдебиеттер Scopus, PubMed, Web of Science, CyberLeninka және басқа да мәліметтер базаларында ізделді.

Зерттеу нәтижелері: талдау көрсеткендей, әйелдерде зәрді ұстамау жалпы халықтың 20-30% - кездеседі, 55 жастан асқан 35% - дан астамында кездеседі, ең маңызды қауіп факторлары жас, гормоналды өзгерістер, бірнеше рет босану, семіздік және отырықшы өмір салты болып табылады. Халықаралық деректерді салыстырмалы талдау табысы жоғары және төмен елдер арасындағы таралу мен емдеуге қол жеткізудегі айтарлықтай айырмашылықтарды, сондай-ақ мәдени және әлеуметтік кедергілердің көмекке жүгінуге әсерін анықтады. Зәрді ұстамаудың ургентті және аралас түрлері өмір сүру сапасын нашарлатып, мазасыздықты, депрессияны және әлеуметтік белсенділіктің төмендеуін тудыратыны анықталды. Анықталған олқылықтар- ұзақ зерттеулердің жетіспеушілігі, бағдарламалардың мәдени контекстке нашар бейімделуі және осал топтардың шектеулі өкілдігі әйелдерге көмектесудің тұрақты, мәдени-сезімтал модельдерін құру қажеттілігін көрсетеді.

Қорытынды: әйелдердегі зәрді ұстамау-бұл кешенді тәсілді қажет ететін жаһандық денсаулық мәселесі. Эпидемиологиядағы, диагностика мен емдеуге қол жеткізудегі бар айырмашылықтар, сондай-ақ мәдени және жас ерекшеліктері туралы деректердің болмауы пәнаралық және еларалық зерттеулерді жүргізу қажеттілігін көрсетеді. Мәдени сезімтал және ғылыми негізделген бағдарламаларды әзірлеу көмектің қолжетімділігін арттыруға, әйелдердің өмір сүру сапасын жақсартуға және осы жағдайдың жаһандық ауыртпалығын азайтуға мүмкіндік береді.

Түйінді сөздер: *әйелдер, әйелдерде зәрді ұстамау, қауіп факторлары, таралуы; стрессті ұстамау, өмір сапасы.*

Дәйексөз үшін:

Рыспаева Ж.А., Хисметова З. А., Берікұлы Д., Серикова-Есенгельдина Д.С., Кинаятова Ш.К., Шарипова Х.К., Оспанова Ш.Х. Шет елдердегі әйелдер арасында зәр шығаруды ұстамаудың қауіп-қатер факторлары мен таралуы. Әдебиеттік шолу // Ғылым және Денсаулық сақтау. 2025. Vol.27 (5), Б. 203-213. *doi 10.34689/SH.2025.27.5.024*

Introduction

Urinary incontinence (UI) in women is a significant medical and social problem that affects both the physical and psychoemotional state of women in different age groups. According to the definition of the International Continence Society (ICS), UI is an involuntary leakage of urine, which can be either a minor inconvenience or a serious disorder that significantly worsens the quality of life. In the context of rapidly aging population, an increase in chronic diseases and lifestyle changes, the relevance of studying the prevalence and risk factors of UI increases, especially in the international context, where rates may vary depending on cultural, medical and socioeconomic conditions [8, 11].

According to numerous studies, the prevalence of UI among women varies widely, from 5% to 70%, depending on age, country, diagnostic methods, and study design [9]. The most common forms are stress urinary incontinence (SUI), urge urinary incontinence (UUI), and mixed urinary incontinence (MUI), each with unique causes, clinical manifestations, and consequences for the patient [6]. The prevalence of UI increases significantly with age, especially after menopause, with women over 60 years of age at much greater risk [3].

Risk factors for urinary incontinence in women are multifaceted and include physiological, behavioral, and social aspects. The most well-known predictors are age, obesity, multiple births, mode of delivery (vaginal birth), decreased estrogen levels in the postmenopausal period, surgical interventions (e.g., hysterectomy), and the presence of chronic diseases such as diabetes or chronic cough [10, 12]. At the same time, increasing attention in recent years has been paid to social determinants of health - level of education, physical activity, smoking, and even access to sanitary conditions [2; 7].

At the same time, despite its high prevalence and serious consequences, urinary incontinence remains an under-discussed topic in society. Women often do not seek medical help due to a sense of shame, fear of being misunderstood, or the belief that it is a natural consequence of aging that nothing can be done about [5]. This leads to delays in diagnosis and treatment, as well as to a significant decrease in quality of life. Women with UI may experience difficulties in social, professional, and intimate spheres, suffer from anxiety and depression, limit their activity, which in turn aggravates the severity of the condition [1, 4].

Modern research emphasizes the importance of a comprehensive approach to assessing not only physiological symptoms, but also subjective experiences and patient perceptions of their condition. The purpose of this literature review is to comprehensively analyze scientific data from the last 10 years (2015–2025) on risk factors and prevalence of urinary incontinence among women in foreign countries, as well as to consider the impact of this condition on quality of life. The review focuses on systematization of available epidemiological data, classification of risk factors by their nature and modifiability, analysis of differences in prevalence by regions and cultures, and identification of research gaps that require further scientific attention.

The review will cover the following key areas: definition and classification of urinary incontinence types, biomedical and social risk factors, statistical data on prevalence in different countries and regions, as well as psychosocial aspects and the impact of UI on the quality of life of women. Academic sources were used in preparing the review: peer-reviewed articles, meta-analyses, systematic reviews, international reports and clinical guidelines published no earlier than 2015. Thus, the presented review is aimed at forming a holistic and evidence-based understanding of urinary incontinence in women, its main predictors, epidemiology and consequences, which is important for both clinicians and researchers, as well as for public health specialists, policy makers and women's health programs.

Definition and classification

According to the International Continence Society (ICS), urinary incontinence (UI) is "a complaint of any involuntary leakage of urine" [15]—that is, a symptom that may occur without necessarily being associated with a social or hygienic problem [22]. This interpretation ensures diagnostic sensitivity, but at the same time raises debate about its effectiveness in linguistic and sociomedical research [13].

The classification of UI includes three main types: stress urinary incontinence (SUI), urge urinary incontinence (UUI) and mixed urinary incontinence (MUI). These categories are based on differences in clinical manifestations, pathophysiological mechanisms and treatment approaches. This typology is recognized by leading international organizations and is widely used in clinical and epidemiological studies [10, 17].

Stress urinary incontinence (SUI) is defined as involuntary leakage of urine during physical effort, coughing, sneezing or other stress accompanied by an increase in intra-abdominal pressure (ICS, 2018). The most common cause of SUI is urethral hypermobility associated with weakening of the muscles and connective tissue of the pelvic floor, especially after vaginal childbirth and in the postmenopausal period. The second pathogenetic mechanism is considered to be intrinsic sphincter deficiency, in which the pressure in the urethra decreases, and it is unable to hold urine even in a normal position [17,19]. SUI is the most common form of UI in young and middle-aged women, accounting for up to 40% of all cases of urinary incontinence [10].

Urge urinary incontinence (UUI) is characterized by a sudden and strong urge to urinate, accompanied by urine leakage. It is associated with overactivity of the detrusor, a muscle layer of the bladder that contracts involuntarily before the required volume is reached (American Urological Association [AUA], 2019). UUI can have both idiopathic mechanisms and organic causes, including neurological diseases (Parkinson's disease, multiple sclerosis, consequences of stroke), as well as urinary tract infections and innervation disorders [19]. UUI is more common in older women and can significantly reduce quality of life, especially when accompanied by social anxiety.

Mixed urinary incontinence (MUI) combines symptoms of both stress and urge incontinence, i.e. leakage can occur both during physical activity and during strong urges. MUI is often diagnosed in older women and requires an individualized approach to treatment, with an emphasis on the dominant type of symptomatology (AUA, 2019; 18]. Differential diagnosis and accurate determination of the predominant form are especially important for choosing effective therapy.

In addition to the three main types, ICS also distinguishes additional clinical forms: postpartum incontinence, nocturnal enuresis, coital incontinence, and functional incontinence [38]. Postpartum incontinence occurs during the first 12 months after childbirth and may be due to damage to the pelvic floor. Coital urinary incontinence occurs during or after sexual intercourse and is often associated with the presence of pelvic organ prolapse. Nocturnal enuresis in adult women is rare, but may accompany neurogenic diseases. Functional incontinence is associated with cognitive or physical limitations, in which the patient does not have time to get to the toilet in time, despite the preserved ability to control urination [19].

A clear classification of urinary incontinence is necessary not only for correct diagnosis, but also for choosing the optimal treatment strategy. Thus, in case of stress incontinence, the first line of therapy is considered to be exercises for the pelvic floor muscles, while urgent incontinence often requires drug intervention aimed at reducing the activity of the detrusor. In case of the mixed form, a combined approach is used. Thus, the typology of UI has important practical significance and directly affects the quality of medical care for women suffering from this disorder.

The use of international definitions and typologies developed by the ICS and endorsed in clinical guidelines helps standardise approaches to the diagnosis, treatment and investigation of urinary incontinence. This consistency allows for cross-national comparisons, adaptation of treatment protocols and development of effective prevention and intervention programmes, particularly in the context of the increasing prevalence of this condition among women worldwide.

Risk factors

Urinary incontinence (UI) in women is a multifactorial condition, the development of which is caused by the interaction of physiological, medical, behavioral and socioeconomic factors. Scientific research in recent years confirms that the risk of UI increases under the influence of both unchangeable factors, such as age, and modifiable factors, including lifestyle, body weight, reproductive history and the presence of chronic diseases. A comprehensive assessment of these factors allows not only to clarify the prognosis, but also to develop personalized prevention strategies.

One of the most significant risk factors is age. Modern studies show a clear relationship between the aging of the body and the increased prevalence of urinary incontinence, especially after 50 years. The postmenopausal period is accompanied by a decrease in estrogen levels, which leads to atrophic changes in the genitourinary system: tissue elasticity deteriorates, urethral pressure decreases, and pelvic floor muscles weaken. These changes contribute to the development of stress incontinence and other forms of urinary retention disorders [18, 24].

Reproductive factors play an equally important role. Scientific data demonstrate that with an increase in the number of births, especially vaginal, the likelihood of developing UI increases significantly. Parity is an independent predictor of stress incontinence, since each subsequent vaginal birth increases the risk of damage to the supporting structures of the pelvic floor, in particular the fascia and muscles responsible for urinary continence. In addition, surgical interventions in gynecological practice, including hysterectomy, are also associated with an increased likelihood of UI, especially in cases where the anatomical integrity of the pelvic floor is disrupted [17, 19].

Overweight and obesity are among the most studied and clinically significant modifiable risk factors. Meta-analyses confirm that body mass index (BMI) is closely associated with the likelihood of developing both stress and

urge incontinence. Increased intra-abdominal pressure in obese women contributes to deterioration of urethral sphincter function and weakening of pelvic support, which makes urinary continence less effective. In addition, obesity is often accompanied by metabolic syndrome, insulin resistance, and type 2 diabetes, conditions that also increase the risk of UI [18, 23].

Behavioral factors and lifestyle also play a significant role. Low physical activity and prolonged sitting (more than 7 hours per day) have been shown to correlate with an increased prevalence of both stress and urge incontinence. The mechanisms include deterioration of blood circulation in the pelvic area, decreased muscle tone, and general physical inactivity. Studies based on NHANES (2007–2018) demonstrated a significant association between a sedentary lifestyle and an increased risk of UI in women [25]. Smoking, as another lifestyle factor, can increase UI symptoms through the development of chronic cough and increased intra-abdominal pressure, as well as due to vascular damage and ischemia of the pelvic floor muscles [23].

A recently published study from Hungary found that the risk of sarcopenia (reduced muscle mass and function) is a significant independent factor for the development of urinary incontinence in women over 50 years of age. In addition to age factors and complications of childbirth, the SARC-F score was significantly associated with the presence of UI (turn0search5) - women with a high risk of sarcopenia had a significantly higher probability of incontinence [69]. This highlights the need to include biomuscular parameters in multivariate risk models.

In recent years, there has been growing interest in the use of machine learning methods to predict the risk of developing UI. One such study by Benítez-Andrades et al [20] found that the most significant variables associated with postpartum incontinence were body weight, physical activity, lifestyle, age, and voiding habits. This opens up prospects for early intervention and prevention, especially in high-risk groups.

It is important to note that systematic differences in the level and structure of risk between regions and countries require further study. International reviews indicate that risk factors are similar in developing countries, but the prevalence of UI may be higher due to limited access to treatment, higher birth rates, and lack of prevention programs [21, 26]. In addition, cultural differences in the perception of women's health and the taboo nature of the topic of incontinence may reduce the likelihood of seeking help, and, as a result, increase the burden of the disease.

hus, risk factors for urinary incontinence in women are multicomponent and interrelated. They include age, hormonal changes, obstetric and gynecological history, body weight, chronic diseases, lifestyle characteristics and social determinants. Given the high prevalence of UI and its negative impact on quality of life, timely identification and control of modifiable risk factors, as well as the development of individualized prevention and treatment strategies, are of particular importance.

Prevalence and statistics

Urinary incontinence (UI) among women is a global problem, and its prevalence varies significantly depending on the region, age structure of the population, study methodology, and diagnostic tools used. Recent meta-analyses cover dozens of countries and show that in developing countries, the global prevalence is approximately 31.2% (95% CI: 29.0–33.4), with stress UI recorded in 20.7%, urgency UI in 13.1%, and mixed UI in 17.8% of women [27, 33]. In countries with higher incomes and developed health care systems, overall UI rates are about 25.7% (95% CI: 22.3–29.5) [27].

In older women, the prevalence of UI is even higher: according to a meta-analysis of 29 population-based studies involving 518,465 women aged 55 to 106 years, the rate was 37.1% (95% CI: 29.6–45.4), with maximum values of up to 45.1% in Asian countries and minimum values of up to 9.5% in Mexico [28, 31]. There is also a tendency for the prevalence of UI to increase in studies of a later period, which is recorded by meta-regressions over time [28]. A global prevalence analysis of overactive bladder (OAB) as a syndrome closely associated with urgency incontinence showed that it occurs in 21.9% of women (95% CI: 20–24%), with a higher risk in women over 60 years of age (OR ≈ 28.3) and in obese individuals (OR ≈ 18.6) [29]. Since OAB is often associated with UUI, these data indirectly confirm the increased prevalence of the urgency form in the elderly and women with high BMI. Data from the United States, obtained using representative samples and standardized questionnaires, show that approximately 61.8% of the adult female population in the United States has ever experienced UI, and 32.4% of women experience symptoms monthly. Among women with UI, 37.5% suffer from the stress form, 22.0% from the urgent form, 31.3% from the mixed form, and approximately 9% from the indeterminate form (Sandvik Severity Index ≥ moderate) [30].

A review of sexual and professional behavior in women in the Persian Gulf revealed unique regional characteristics: in the Gulf countries (Saudi Arabia, UAE, Kuwait, etc.), the prevalence of UI varied from 10% to 50%, while a significant proportion of women were embarrassed to discuss the problem with health professionals, which could lead to underestimation of the actual rates [32].

In Africa, based on the results of 22 studies covering different regions of the continent, the pooled prevalence of UI was about 24% (95% CI: 17–33), with variability from 2% to 80%. SUI was observed in 35% of women, UUI in 28%, and MUI in 31% [62]. In North Africa and the Maghreb, the overall rates were up to 41%, with some studies reporting 80% UI in women in Egypt [35].

In a large-scale population-based study in southern China (n=9584) conducted in 2022–2023, the prevalence of UI among women was 24.8%. The stress form was observed in 12.7%, mixed form in 8.0%, and urgent form in 4.1% [70]. Key risk factors included urban lifestyle, postmenopause, multiple vaginal births, fetal macrosomia, and previous pelvic floor surgeries. Despite the significant negative impact on quality of life, only 20.6% of women with UI sought medical help.

Regional reviews of Europe and Asia also show a range of prevalence, from 5% in individual countries to 57.7% in Iran, with an overall mean of about 25.7%. In these countries, the most common forms are SUI (~12.6%), followed by MUI (~9.1%) and UUI (~5.3%) [27].

Contemporary reviews of SUI in Saudi Arabia found a mean prevalence of stress incontinence of 26% (95% CI:

approximately 14–41), with a wide range from 3.3% to 50% depending on the population and methodology. In women postpartum or with underlying chronic conditions, the prevalence was as high as 33%, and in the general population, approximately 17% [34].

Thus, despite methodological differences, it can be stated that the prevalence of UI among women ranges from 20% to 30% in the general population and exceeds 35% in age groups over 55 years or in the presence of risk factors such as obesity, high reproductive load and metabolic diseases [42]. The stress form remains dominant in young and middle age, while the urgent and mixed forms increase with age, obesity and chronic pathology. This policy of epidemiological trends emphasizes the need to adapt national screening strategies, prevention programs and information campaigns to raise awareness among women and health professionals.

The Impact of Urinary Incontinence on Women's Quality of Life

Urinary incontinence (UI) has a significant negative impact on women's quality of life, affecting both physical and emotional and social well-being. A meta-analysis of over 24,000 participants found that UI was significantly associated with poorer health outcomes as measured by the SF-36 scale, with a strong effect size, especially for the general mental and physical health scale [27]. This is supported by local studies, in which women with UI symptoms demonstrated significantly lower quality of life scores on the IIQ-7, UDI-6 and ICIQ-LUTSqol scales.

In a population-based study conducted in India, nearly 35% of women of reproductive age reported symptoms of UI. More than 95% of them said that UI interfered with their daily activities, limited their mobility, public places, and family life. Women reported anxiety, decreased self-esteem, and social isolation. This indicates that the impact of UI goes far beyond a medical problem, becoming a barrier to a fulfilling social life.

Similar results were obtained in Saudi Arabia. A study involving over 1,700 women aged 30 to 75 years established a high prevalence of all forms of UI. Moreover, the most pronounced deterioration in quality of life was recorded in women with urgent and mixed forms. The use of validated questionnaires showed that women with severe symptoms of UI significantly more often experience depressive disorders, psychological exhaustion, decreased sexual satisfaction and social anxiety [36]. Similar data are coming from Jordan: there, a pronounced link was also found between the presence of UI and decreased self-esteem, social involvement and overall psychoemotional well-being [37].

A UK study has shown that even in countries with high levels of healthcare development, urinary incontinence remains a stigmatised issue. Although around 40% of women report symptoms, only 17% seek help, citing shame and the belief that urinary incontinence is a natural part of ageing. This highlights the global nature of the problem and the importance of social support and awareness raising.

Asian data also confirm the global nature of the problem. According to the large-scale LUTS Asia study conducted in China, South Korea, and Taiwan, women with SUI symptoms were 1.6 times more likely to suffer from anxiety disorders and also reported decreased work and home productivity [41]. In South Korea and Japan, even mild UI was found to impact self-esteem and confidence, while severe forms significantly increased the risk of social isolation.

Of interest are studies conducted among physically active women. In a sample of female athletes and participants in CrossFit programs, 36% reported symptoms of UI. This was accompanied by decreased confidence, limited training, and avoidance of social events [71]. The data indicate that UI is not only a problem for older or multiparous women, but also for younger, athletic, and socially active groups.

An integrative review of Brazilian studies from 2015 to 2019 confirmed the widespread use of instruments such as the I-QOL, ICIQ-SF, and KHQ. The authors identified four key categories: women's perception of UI, impact on daily life, association with depressive and anxiety symptoms, and the need for a multidisciplinary approach [39]. UI was viewed not only as a physical problem but also as a factor undermining women's identity and dignity.

In summary, the impact of UI on women's quality of life is universal but varies across cultural, economic and health contexts. Key impacts include physical limitation of activity, sleep deterioration, anxiety, depression, and decreased sexual and social activity. Urgent and mixed incontinence, as well as severe symptoms, are the most predictive factors for decreased quality of life. Current approaches require a comprehensive assessment of patients with UI, including not only physiological but also psychological and social aspects. Providing access to treatment, reducing stigma and raising awareness are key steps to improving the overall health of women with UI.

International approaches to screening, prevention and treatment of urinary incontinence in women

Many countries around the world implement strategies for screening and prevention of female urinary incontinence (UI), but approaches vary significantly in effectiveness, coverage, and cultural context. In the United States, the Women's Preventive Services Initiative (WPSI) recommends annual screening of all women for UI, including assessment of the impact of symptoms on daily life and quality of life, and referral for further evaluation and treatment when indicated [48]. This strategy is designed to identify complaints that often go unreported by the woman herself.

In the UK and Europe, the 2021 NICE Guidelines recommend the implementation of screening and prevention programmes, including monitoring of women in age groups from pregnancy to menopause. NICE emphasises the importance of women learning correct pelvic floor exercise techniques under the supervision of qualified professionals, ideally starting before birth and continuing into the postnatal period [47]. The UK model also includes assessment of family history and calculation of individual risk using the UR-CHOICE algorithm, allowing for proactive provision of PFMT to high-risk groups [47].

In the European Union, the European Association of Urology (EAU) guidelines for non-mechanical LUTS (including UI) also support pelvic floor exercises (PFMT), particularly to reduce symptoms of urge incontinence and overactive bladder (OAB). PFMT has shown statistically significant reductions in urge frequency and leakage

episodes in most RCTs, although some studies note heterogeneity of protocols and inconsistent results [50].

In Asian countries such as South Korea, Taiwan, and China, digital technologies have been developed to complement traditional methods. A review included 89 studies from 14 countries and found that mobile apps, web-based programs, and telemedicine support women in completing PFMT, increasing adherence to therapy and making the intervention more convenient. However, these technologies are often not adapted to cultural contexts and the changing needs of women at different stages of life [44].

In Canada and Australia, national campaigns, World Continence Week, have been organized under the auspices of the International Continence Society (ICS), with educational events, hotlines, media, and public campaigns aimed at reducing stigma and raising awareness. These efforts encourage women to seek help earlier and to participate more actively in prevention programs [51].

Conservative prevention and treatment measures in many countries are based on PFMT. Meta-analyses and systematic reviews confirm that pelvic floor exercises are effective for stress and mixed incontinence, being superior to placebo or no treatment. The combination of PFMT with biofeedback may improve muscle strength, but the overall effect on reducing leakage episodes remains controversial [45, 52]. Supervised PFMT during pregnancy reduces the risk of developing PFD and is cost-effective in high-risk groups [47].

In addition to PFMT, physiotherapeutic methods have become widespread: biofeedback, electrical stimulation, magnetic stimulation, vibration training. They are especially in demand in contexts where women are unable to independently initiate pelvic floor contractions, or with a combination of OAB and UUI [49]. At the same time, innovative methods such as laser therapy, plasma injections, stem cells and radiofrequency exposure are still at the stage of clinical research and require standardization of procedures and long-term evaluation of effectiveness [46].

The transition to drug regimens for UUI is based on the recommendations of the American Urological Association (AUA) - treatment includes anticholinergic drugs and beta-3 agonists, but the AUA emphasizes that drug intervention should be accompanied by behavioral therapy and PFMT [43].

Surgical methods remain the last line of treatment for SUI: the most commonly used are slang procedures, colposupsions, injections of bulking agents (e.g. Macroplastique). Recent studies confirm the effectiveness under strict patient selection, but require long-term follow-up due to possible complications and variability of results [46].

Barriers to the implementation of screening and treatment programmes include lack of trained staff, cultural stigma, low adherence to exercise among women, financial constraints and low access to telemedicine platforms, particularly in low-income countries. Research has highlighted the need to tailor programmes to local realities, taking into account linguistic, cultural and socio-economic factors [44].

Thus, international models of UI prevention and treatment demonstrate a diversity of strategies: from standardized screening recommendations, national promotional campaigns and PFMT to the introduction of digital technologies and complex conservative and surgical methods. Early diagnosis, multidisciplinary approaches and adaptation according to the culture and resources of the country are always prioritized. The effectiveness of further measures depends on strengthening the evaluation of the real results of interventions, scaling up successful programs and removing structural barriers to women's access to adequate care.

Research gaps and directions for future research on urinary incontinence in women

The international scientific literature has seen many advances in understanding the risk factors, prevalence, and impact of urinary incontinence (UI) on women's quality of life. However, there are still a number of significant gaps that need to be addressed to improve data accuracy and the effectiveness of prevention and treatment. First, despite the existence of screening recommendations, there are no randomized controlled trials (RCTs) demonstrating that mass screening improves clinical outcomes and women's quality of life. Existing assessment tools—the Michigan Incontinence Symptom Index, Bladder Control Self-Assessment, Overactive Bladder Awareness Tool—show good sensitivity and specificity, but their impact on symptom reduction requires confirmation by large multicenter studies [55].

Second, most studies have focused on PFMT and basic cognitive-behavioural interventions; but only recently have the range moved from physical exercise to innovative e-health tools. Despite the positive results of digital therapies, there is little long-term data on the sustainability of effects 1–2 years after programme completion [54]. Furthermore, current RKIs on the use of telemedicine are often limited by small sample sizes, short follow-up periods, and are conducted in high-income countries, limiting their applicability to developing regions [61].

The third important area is surgical methods: there are many types of interventions, including minimally invasive slang procedures, colpospuspension, injections of bulking agents. However, comparative studies of the effectiveness and safety of different techniques in women of different ethnic groups and ages are rare. Possible complications (erosions, dysfunctions, recurrences) require long-term (>5 years) observation, which is often not carried out [53].

The fourth gap concerns cultural and socioeconomic aspects. In most countries in Africa, Asia and Latin America, data on perceptions of TM, willingness to seek care and stigma barriers are extremely limited. There is a particularly limited amount of research comparing successful awareness-raising strategies across different cultural contexts [56]. Without this, it is difficult to tailor interventions and educational campaigns to local needs.

The fifth gap concerns age groups. Most studies focus on either older women or women of reproductive age, while pre- and perimenopausal women have received less attention. Pilot studies suggest that menopause is a time when unique hormonal and psychological triggers for UI occur [59], but this has not been confirmed in larger samples.

The sixth aspect is the lack of studies on comorbidity and multi-syndrome interactions: diabetes, asthma, obesity, depression, pelvic organ prolapses. Most studies consider factors in isolation, rather than in combination, while clinical practice often encounters complex cases [57].

The seventh gap concerns diagnostic methods: most studies use self-report scales, while uroflowmetry, voiding diaries, and bioimpedance measurements are rarely integrated into epidemiological studies. Such biometric data could improve risk stratification and diagnostic accuracy [58]. The eighth gap is the lack of comparisons between low-, middle-, and high-income countries regarding treatment access, cost of PFMT, telemedicine, and surgery. Economic barriers are often overlooked by researchers, although they are critical for scaling up programs [60].

Future research perspectives include: conducting multicenter RCTs of mass screening, including monitoring of impact on quality of life and reimbursement of costs; long-term follow-up of the effectiveness of digital and physical therapy regimens; comparative studies of surgical procedures taking into account ethnic and age differences; culturally contextual studies in low-income countries to develop adaptive educational programs; focused studies on the transition of women from premenopause to menopause; and integration of biometric data into the epidemiology of UI.

Global differences, migration and age-related challenges in the context of female urinary incontinence

This meta-analysis demonstrates differences in access to and choice of surgical treatment for stress urinary incontinence in women according to geographic region, age and level of health infrastructure, highlighting that countries with limited resources and migration barriers experience less access to modern surgical options [38]. This highlights global inequalities and the need to adapt interventions to demographic realities.

Urinary incontinence in women is not only a clinical problem, but also a phenomenon deeply rooted in the social, cultural and economic context. Differences in access to treatment, awareness, perception of symptoms and willingness to seek help are influenced by many factors, from geography and income level to migration status and age [40]. This requires taking into account cross-cultural and age-specific features in the development of care programmes and research.

In low-income countries such as Nigeria, awareness programmes on UI have only recently been implemented at the health care level. A cluster randomized trial found that women's education campaigns increased health care utilization, improved knowledge about the causes and prevention of UI, and increased women's self-efficacy in urinary control [62]. However, stigma and lack of trained personnel remain major barriers to the sustainability of such programmes.

The lack of long-term longitudinal studies is another systemic gap in understanding the dynamics and development of urinary incontinence. A systematic review found a lack of data on how the disease progresses over time and the effectiveness of different prevention strategies over decades [63]. Without reliable long-term data, it is impossible to develop sustainable interventions and evidence-based national policies.

Comparative analyses of invasive and non-invasive treatments for UI have shown that many studies are limited to comparing individual methods within narrow populations, without taking into account the social and cultural context [64]. For example, women of migrant background or ethnic minorities are often excluded from clinical trials, despite the fact that they may face higher barriers to treatment.

A study in Bangladesh found that awareness of symptoms and access to diagnosis remain very low among older women. Even when symptoms are present, most women do not seek medical care, citing the "naturalness" of symptoms in old age, shame, and lack of time [65]. These findings support the need for culturally sensitive programs that address stigma and educate both women and health care providers.

In the context of migration and cultural adaptation, particularly in Western Europe and North America, migrant women face particular barriers. A study of women of South Asian descent living in the UK found that even when symptomatic, they were unaware of the benefits of pelvic floor exercise (PFMT), distrusted doctors, and had cultural discomfort discussing intimate topics [66]. These barriers highlight the need to tailor treatment programs to cultural norms, language, and health literacy.

A comparative analysis of access to UI care in Hong Kong found that even in urbanised societies there are significant gender and class differences in access to diagnosis, particularly in public facilities. Women with low incomes or without regular health insurance were less likely to receive adequate diagnosis and PFMT [67]. This suggests structural barriers in health systems that require policy intervention.

Finally, postmenopausal UI requires special attention. In Asian countries, despite the high prevalence of urogenital symptoms, there is an extremely low proportion of clinical visits. In particular, a study in South Korea and China demonstrated that a decrease in estrogen levels is often interpreted as a normal sign of aging, and UI is not considered a pathological condition requiring treatment [68]. This limits the possibilities for early intervention and prevention of complications.

Thus, global challenges in the context of female urinary incontinence go beyond clinical diagnosis. Inequalities in access to information, treatment and prevention are caused not only by economic resources, but also by cultural, migration and age barriers. Promising areas for future research and interventions should include: longitudinal studies in different populations, adaptation of PFMT and screening programs to the cultural context, gender-sensitive training of professionals, and reducing systemic barriers in health care systems. Addressing these disparities will improve the quality of life of millions of women worldwide and ensure equitable access to health care.

Conclusion

Urinary incontinence in women is a significant global public health problem with complex impacts on physical, psychological and social well-being. The literature review demonstrated that despite a wide range of studies on the definition, classification and risk factors of incontinence, there are still significant gaps in the scientific literature, particularly regarding age and cultural differences, long-term effectiveness of interventions and equitable access to treatment.

A comparative analysis of international data revealed not only the epidemiological features of UI in different countries, but also significant diversity in approaches to screening, prevention and treatment. It was found that high-

income countries have a more developed infrastructure for diagnosis and intervention, while in low- and middle-income countries, barriers include stigma and lack of resources, as well as a lack of adapted programs.

Particular attention should be paid to the need for culturally sensitive, accessible, and evidence-based programs to help women, adapted to different age, ethnic, and social groups. Challenges related to the lack of longitudinal studies, the lack of biometric data in epidemiological models, and the limited representation of vulnerable groups in scientific papers remain relevant.

Addressing these gaps requires interdisciplinary and cross-country collaboration, strengthening research in diverse populations, and integrating innovative, sustainable models of diagnosis and treatment. Only through such an approach can equitable access to care be achieved and the global burden of female urinary incontinence be substantially reduced.

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