

Innovation In Urine Incontinence in Lithuania and Abroad: Review

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Abstract

Urinary incontinence is a prevalent and multifaceted health issue with significant social, emotional, and physical consequences, yet it remains insufficiently addressed globally and in Lithuania. Objective. This review explores recent innovations in the prevention, diagnosis, and treatment of urinary incontinence, highlighting advancements such as biofeedback therapy, bio-diary testing, novel physiotherapeutic techniques, pharmacological developments, minimally invasive surgical procedures, and digital health solutions like smart app monitoring. Methods. Literature review was made. Results. International collaborations and research projects further foster the development of effective, individualized management strategies. Despite ongoing progress, there remains a need for continuous research to implement innovative, patient-centered approaches that improve quality of life. Conclusions. This review emphasizes the importance of integrating global best practices into Lithuanian healthcare and encourages sustained efforts to combat this pervasive disorder.

Keywords: innovation; urinary incontinence; Lithuania; review

Introduction

The problem of urinary incontinence is important for public health, but its solution lacks attention both in Lithuania and abroad. The aim of the study is to examine the innovations in urinary incontinence and their impact on people's lives, and to identify modern trends in prevention and treatment.

Urinary incontinence is a worldwide problem with many social and medical implications (Vaughan & Markland, 2020). Urinary incontinence is a condition in which a person loses the ability to control the flow of urine from the bladder (Nambiar et al., 2022). It can range from a small amount of leakage to complete loss of control and be temporary or long-term problem. The most common causes of urinary incontinence are old age, pregnancy, genital surgery, rectal problems (Denisenko et al., 2021), muscle weakness, nervous system disorders, hormonal changes (Sussman et al., 2020), comorbidities, functional disability, and sedentary behavior (Alves et al., 2025), increased body mass index, the presence of diabetes mellitus (Szabo et al., 2025). One of the most important muscles that weaken are the pelvic floor muscles. As the pelvic floor muscles weaken, core stability is lost, pain occurs in

the lower back and pelvic areas, balance is impaired, and stress urinary incontinence may occur, which affects 20-30% of young adults (Bayramoglu Demirdogen et al., 2025). It is important to pay attention to the symptoms of this problem, to understand what it is and how it can be effectively treated to improve the patient's quality of life (Denisenko et al., 2021).

Types of urinary incontinence and their distinctive features

There are three primary types of urinary incontinence. The first is stress urinary incontinence, which occurs when urine leaks during activities such as coughing, sneezing, or intense physical exertion (Alves et al., 2025). The weakening of pelvic floor muscles is the leading factor contributing to stress urinary incontinence in women (Szabo et al., 2025). The second is urge urinary incontinence, characterized by an involuntary loss of urine following a sudden and strong urge to urinate. The third type is mixed urinary incontinence, which presents with symptoms of both stress and urge incontinence (Alves et al., 2025).

Urinary incontinence can take many forms, including stress, emotional health, and environmental incontinence. Stress, which can be caused by a variety of everyday situations, can cause changes in kidney function that affect the body's ability to properly regulate urine production. At the same time, this stress can impair the sensitivity of the bladder wall, which can lead to involuntary leakage of urine even with minimal exertion or irritation (Koch & Kaufman, 2022). Emotional incontinence most often occurs in children when they are unable to control their bladder due to severe emotional or psychological stress in situations such as adverse events, accidents, or similar stressful events that can significantly affect their psychological well-being and general well-being (Trowbridge & Hoover, 2022).

Stress can be one of the main causes of urinary incontinence. Increased stress levels can disrupt the body's ability to control the bladder, which can lead to incontinence. In such cases, it is important to provide appropriate psychological support to the child to resolve the problem of urinary incontinence (Koch & Kaufman, 2022).

Prevalence of urinary incontinence

Urinary incontinence is a fairly common problem worldwide, affecting both women and men. Studies show that urinary incontinence affects about 15-30% of women and about 5-15% of men. In addition, few people seek medical help for this problem, so the true prevalence may be even higher than statistics indicate (Vaughan & Markland, 2020). Some population-based studies have indicated that the prevalence of this condition ranges from 5% to 69%, with the highest rates observed among older adults. A nationwide survey conducted across all regions of Brazil found that 52.8% of women are affected, and approximately 30% report experiencing stress urinary incontinence (Alves et al., 2025). Studies conducted in Lithuania show that urinary incontinence affects up to 30% of women and about 15% of men. This is a significant health problem that is still insufficiently studied and must be constantly monitored. Despite this prevalence, most people suffering from urinary incontinence do not seek medical attention for this problem. Therefore, it is important to increase awareness and education in this area so that people receive appropriate help and treatment (Romeikiene & Bartkeviciene, 2021).

Consequences of urinary incontinence

Urinary incontinence can cause a number of undesirable consequences and challenges, which depend greatly on individual factors such as age, gender and general health, which require special and in-depth analysis. The most common consequences of urinary incontinence include skin irritation, infections, joint problems, sleep disorders and even depression, which may require professional medical attention (Gacci et al., 2022). For example, skin irritation can occur due to constant moisture, and infections can occur due to the accumulation of bacteria, so it is important to understand that if not treated in time, the situation can only get worse (Reis da Silva, 2024). These symptoms, compared to other health problems, can cause both physical and emotional discomfort, further complicating the person's daily life and daily activities. The severe impact of urinary incontinence can lead to significant limitations in physical activity, as well as restrictions on social participation, which can significantly change the person's quality of life and mental state (Nightingale, 2020). Even simple social interactions can become a challenge, which can lead to even greater stress and anxiety. These consequences can not only have a direct impact on daily activities, but also lead to isolation or reduced self-esteem, so it is particularly

important to seek and implement possible solutions to alleviate this difficult situation and restore the person's feeling of at least partial control over his life (Mair, 2021). Continuous monitoring is required and carefully selected solutions can help reduce problems and improve quality of life, so it is necessary not to avoid conversations on this topic in order to find the best answers.

The physical consequences can significantly impact the quality of life of people with urinary incontinence. These can include muscle weakness, joint pain, obesity, and even physical disability (Zivkovic et al., 2022). In addition, long-term urinary incontinence can contribute to the development of chronic diseases such as diabetes and heart disease. Therefore, it is essential to properly assess the consequences of physical inactivity and take preventive and therapeutic measures (Batmani et al., 2021).

Urinary incontinence prevention and treatment

Urinary incontinence prevention includes a variety of lifestyle and nutritional recommendations, as well as specific exercise and training programs that strengthen the pelvic floor muscles and help control bladder function (Milka et al., 2023). In addition, psychological support plays an important role in managing stress or emotional distress that may be associated with urinary incontinence (Monti et al., 2021).

Urinary incontinence can be treated conservatively and with surgical techniques. Conservative treatment includes drug therapies, behavioural training, a variety of neurostimulating methods (anogenital electrical stimulation, neurostimulation of the sacral nerves, Stoller afferent nerve stimulation, pulsatile functional magnetic stimulation). Functional magnetic stimulation is a safe, non-invasive, and painless method for treating urinary incontinence. It is effective and can be conveniently administered in an outpatient setting (Chandi et al., 2004). Drug therapy is one form of treatment for urinary incontinence that aims to improve bladder control and reduce symptoms. The most commonly used medications are anticholinergics, which work by blocking bladder muscle contractions, thereby reducing incontinence (John, 2020). In addition, these medications can help reduce bladder irritation and improve the quality of life of patients suffering from urinary incontinence (Mokhtari et al., 2022). Estrogen-based medications can also be used to help strengthen the bladder wall and pelvic floor muscles. Drug therapy should always be combined with a doctor's supervision and recommendations for maximum effectiveness and safety (Von Aarburg et al., 2021).

Conservative treatment is always the primary treatment option, but surgical solutions, such as mid-urethral slings and apical suspension procedures, ensure solid and long-lasting results (Mondesir et al., 2025). According to the International Urogynecological Association (IUGA), recommended treatments for urinary incontinence and pelvic organ prolapse include tension-free vaginal tape, Burch colposuspension, low-pressure suburethral slings, and the injection of bulking agents (Szabo et al., 2025). Although medical treatments and surgical techniques are constantly evolving, debates persist over the most appropriate diagnostic and therapeutic approaches (Szabo et al., 2025).

Innovations in urinary incontinence management in Lithuania

Recent studies on urinary incontinence in Lithuania reveal that this problem, which was previously considered a taboo, is now becoming more widely discussed, analyzed and taken seriously. There is a trend in society where more and more people are boldly and openly sharing their experiences and experiences related to this complex health problem, which could have become an obstacle in their lives (Sigurdardottir et al., 2020). There is no doubt that the studies conducted at the moment testify that the society is increasingly recognizing the problems of urinary incontinence and seeks to solve these problems more actively and effectively (Monti et al., 2021). Innovations related to this area in Lithuania include advanced diagnostic methods, such as "biofeedback" therapy, which helps patients better understand their condition, and bio-diary testing for urinary incontinence, which allows specialists to assess the situation and its complexity even better and more accurately (Alouini et al., 2022; Hagen et al., 2020).

In addition, new therapeutic tools are emerging, including specially designed exercise programs. These programs, combined with in-depth specialist advice, are designed to improve patients' quality of life, reduce the number of urinary incontinence episodes, and provide more self-confidence in everyday situations. Recently, this topic has attracted increasing attention and concern, and many

specialists are actively searching for more effective methods to help those who face this problem, their inconvenience and discomfort. These modern innovations offer hope to those who face this complex problem and can significantly improve their physical and emotional well-being, allowing them to feel freer and less constrained in everyday situations where past stigmas can overshadow freedom (Woodley et al., 2020).

Recent research on urinary incontinence in Lithuania is focused on developing more individualized treatment options, taking into account the patient's needs and possible causes. New innovations also include modern treatment methods, such as combining various physiotherapeutic procedures with drug therapy to achieve maximum effectiveness. Research is also examining psychosocial factors that influence urinary incontinence and looking for new ways to incorporate them into the treatment process, aiming to ensure more comprehensive patient well-being (Johannessen et al., 2021).

Innovations in urinary incontinence management abroad

The international field of urinary incontinence research is constantly evolving, with significant implications for treatment approaches in different countries, and this is a source of great interest and progress (Alouini et al., 2022). For example, in Germany, the integration of advanced technologies such as ***biometric sensors into an incontinence management system*** have recently been observed, which could truly revolutionize the norms and standards for treating this disorder. These modern sensors not only allow for more accurate and efficient monitoring of the patient's condition, but also provide valuable, crucial information in ***real time about changes in symptoms*** and their development (Sheng et al., 2022).

One of the newer methods of incontinence management worldwide is the use of ***smart apps*** to not only assess ***bladder strength*** but also ***strengthen the pelvic floor muscles***. This involves using a special, ***egg-shaped device*** that is inserted into the vagina, and the data about muscle strength is transmitted to a smart app on a phone or other smart device. In this way, patients can monitor the benefits of ***pelvic floor muscle strengthening exercises*** on their muscles and incontinence management (Chen et al., 2023).

An additional treatment option is the ***artificial urinary sphincter***. Although considered a promising intervention, it is not widely recommended for the management of stress urinary incontinence due to the current lack of evidence from randomized controlled trials, highlighting the need for further investigation. For cases of refractory stress urinary incontinence, conservative approaches such as ***sacral neuromodulation*** have demonstrated clinical efficacy. Furthermore, recent studies suggest that ***laser therapy*** may represent a safe and effective non-surgical treatment for women seeking minimally invasive options for stress urinary incontinence management, with no serious adverse effects reported (Szabo et al., 2025).

Low-intensity extracorporeal shockwave therapy has shown promise as a non-invasive treatment for stress urinary incontinence because it significantly improves patients' quality of life and reduced urine leakage. The therapy was also associated with increased urethral wall thickness, enhanced muscle content, restoration of urothelial integrity, and reduced SUI symptoms during physical activity (Szabo et al., 2025).

Intensive research is underway in Australia on ***new pharmaceutical agents*** for the treatment of irritable bladder syndrome, which undoubtedly promise to reduce adverse effects and at the same time significantly improve the quality of life of suffering patients (Davis & Wyman, 2020).

At the same time, specialists in the US are introducing advanced, ***comprehensive physiotherapy programs*** that help patients strengthen their pelvic floor muscles; this leads to improved urinary control, allowing them to avoid inconveniences in daily life and restore lost self-confidence and abilities (Jha et al., 2024).

Another aspect of new and advanced treatment is psychological support, widely used in Canada, to reduce the anxiety and social isolation of patients often associated with urinary incontinence. ***Therapy sessions with a psychologist, combined with group activities***, undoubtedly help patients better adapt to their condition, find support, learn more effective management strategies in their lives

and daily interactions, thus enabling them to live a full life (Wojcik et al., 2022).

Due to the complications and high expenses associated with surgical treatments, novel therapies targeting the molecular mechanisms of stress urinary incontinence have been developed. Significant recent advancements include stem cell therapy, exosome differentiation, and gene regulation (Szabo et al., 2025).

These and other innovations emerging abroad undoubtedly provide an opportunity to improve our own treatment practices in Lithuania, which is extremely important, given the ever-growing patient demand and the search for new solutions. It is important to constantly monitor and follow these developments so that we can implement the best global practices and ensure a high level of patient care and treatment that meets modern standards and expectations (Martinez et al., 2022; Toprak et al., 2022).

Collaboration with international organizations and the experience of expert feedback will become a cornerstone in preparing to successfully address urinary incontinence problems both in our country and abroad, ensuring that patients receive comprehensive, comprehensive help and support (John, 2020; Mokhtari et al., 2022; Davis & Wyman, 2020; Martinez et al., 2022).

International scientific projects

International research projects are often organized and implemented to bring together specialists, collaborate with different countries, study the problem of urinary incontinence and find new and innovative solutions, best practices that could significantly improve the quality of life of patients (Jefferson & Linder, 2024). The results of these projects, in which scientists from all over the world collaborate, can not only significantly contribute to the development of new scientific knowledge and innovations, but also further improve the broader level of understanding of this important field. Such projects not only promote the exchange of knowledge, but also provide specialists with the opportunity to share their valuable experience and achievements on an international scale. This could help to develop and implement more effective treatment strategies that are designed to adequately meet the subsequent needs of patients (Papinikolaou et al., 2023). In addition, strong collaboration allows for the collection of broader information and data on this complex problem, thereby improving the effectiveness and adaptability of solutions that can be applied in different cultures and health systems (Wojcik et al., 2022).

The IMAGiNE Global (formerly Euro) project, is being implemented in 65 countries and aims not only to improve access to health-care for pregnant women, mothers and newborns, but also to help address many psycho-emotional, breastfeeding and incontinence problems (Valente et al., 2024).

In principle, the implementation of such international projects is crucial to achieve a greater impact in solving urinary incontinence problems and improving the quality of life of people affected by these problems. This opens up new opportunities and future perspectives in research on the problem, as stronger international cooperation and joint research can help to better understand the challenges and find effective solutions that could be applied worldwide (Toprak et al., 2022; Davis & Wyman, 2020; Martinez et al., 2022).

Conclusions

Urinary incontinence is a common problem worldwide, and in terms of scientific research, this health disorder is one of the most frequently studied. However, even despite countless studies, there is still a lack of innovative tools or methods to solve the problem of urinary incontinence. For this reason, this review article presents the latest innovations in the field of urinary incontinence in Lithuania and abroad.

Conflict of interest

There was no conflict of interest.

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