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Urinary incontinence in women residing in the southern region of Kyrgyzstan

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Abstract. The aim of this study was to determine the prevalence of urinary incontinence, its clinical and epidemiological features, and the main risk factors among women over 35 years of age residing in the southern regions of the Kyrgyz Republic (Osh, Batken, and Jalal-Abad regions). The study was conducted in a cross-sectional design using mixed methodology, including quantitative and qualitative methods. The study involved 404 women aged over 35 years (mean age – 41.9 ± 6.6 years). Data collection was carried out using a standardised ICIQ-SF questionnaire, clinical examination, and analysis of obstetric-gynaecological and somatic history. Statistical processing included descriptive statistics methods and assessment of associations using the χ^2 test; differences were considered statistically significant at $p < 0.05$. It was established that 55.7% of women residing in the southern regions of Kyrgyzstan had four or more births, and 43.6% were found to have overweight or obesity

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as indicators of metabolic disorders. A high prevalence of urogenital tract infections was noted: cystitis – 35.2%, pyelonephritis – 25.7%, urethritis – 7.8%. Symptoms of urinary incontinence were recorded in 18.9% of the examined women. A statistically significant association was established between chronic exposure to climatic stress and deterioration of urinary and reproductive health indicators ($\chi^2 = 66.5$; $p < 0.001$). The development of urinary incontinence in women over 35 years of age in the southern regions of Kyrgyzstan is associated with high parity, postpartum injuries, overweight, urogenital tract infections, and adverse climatic and geographical conditions. The obtained results indicate the need to develop an algorithm for early detection of this pathology, as well as to introduce regionally adapted prevention programmes and comprehensive monitoring of women over 35 years of age who are at risk

Keywords: pelvic floor muscle dysfunction; multiparous women; overweight and obesity; urogenital tract infections; climatic stress; women's reproductive health

Introduction

Urinary incontinence (UI) is a widespread condition among women over the age of 35 and is often concealed due to embarrassment, yet it is regarded as a serious public health and medical issue. According to I. Gulamov *et al.* [1], diseases of the genitourinary system are among the main causes contributing to increased morbidity and mortality in the population. These pathologies lead to reduced work capacity, impaired reproductive function, and a significant deterioration in quality of life. Numerous scientific sources note that diseases of the genitourinary system are characterised by a sharp increase in prevalence and, at the same time, belong to the category of diseases that substantially reduce patients' quality of life. The southern region of Kyrgyzstan (Osh, Batken, Jalal-Abad) is characterised by distinct socio-demographic, ethnic, and climatic features.

Based on the studies of T. Kurmanbekov *et al.* [2], the occurrence of urinary incontinence is explained by a combination of multiple factors. These include the complex influence of biological, medical, social, and climatic-geographical conditions. According to H. Mostafaei *et al.* [3], the prevalence of urinary incontinence varies significantly across countries, ranging from 2.8% in Nigeria to 57.7% in Iran. The overall prevalence averages 25.7%. Stress, urge, and mixed forms of urinary incontinence have been reported at approximately 12.6%, 5.3%, and 9.1%, respectively. In women with multiple childbirths, especially those who have given birth three or more times, as well as in cases involving difficult and prolonged labour, obstetric injuries substantially contribute to the functional weakening of the pelvic floor muscles. According to S.J. Woodley *et al.* [4], during childbirth the pelvic floor muscles and ligaments are subjected to considerable mechanical stress, resulting in excessive stretching, micro- and macrotrauma, and damage to the neuroligamentous apparatus. In particular, delivery of a high-birthweight infant or operative obstetric interventions (prolonged labour, episiotomy, vacuum extraction) lead to disruption of the anatomical integrity of the pelvic floor and contribute to decreased muscle tone and supportive function. With repeated childbirth, these processes become cumulative in nature, and structural and functional recovery of the pelvic floor may remain incomplete. As a result, weakening of the pelvic floor muscles disrupts urinary continence mechanisms and significantly increases the risk of developing urinary incontinence and other pelvic floor dysfunctions.

With advancing age, the natural tone and elasticity of the pelvic floor muscles gradually decline, and the mechanical stability of the musculo-ligamentous structures supporting the bladder and urethra deteriorates. According to P. Rostami *et al.* [5], this process is accompanied by age-related degenerative changes, atrophy of muscle tissue, and qualitative alterations in collagen structure. As a result, the supportive function of the pelvic floor weakens, and the mechanism of urinary continence is impaired when intra-abdominal pressure increases (during coughing, laughing, or lifting heavy objects). Obesity is characterised by persistently elevated intra-abdominal pressure, creating continuous additional mechanical stress on the bladder and urethra. Based on the study by I. Milsom & M. Gyhagen [6], elevated intra-abdominal pressure imposes additional load on the pelvic floor muscles and ligamentous apparatus, thereby weakening their supportive function. Consequently, the mechanism maintaining the bladder in its physiological position is disrupted and urethral closure pressure decreases. In addition, obesity is accompanied by metabolic and hormonal disturbances that contribute to reduced muscle tone, impaired nerve conduction, and disturbances of tissue microcirculation. Abdominal obesity is particularly hazardous because it causes a sharp increase in intra-abdominal pressure during coughing, sneezing, or physical exertion. The combined effect of these factors substantially increases the risk of urinary incontinence, especially the stress form, and directly affects the severity of clinical manifestations.

According to data from the National Statistical Committee of the Kyrgyz Republic, a number of authors currently note accelerated ageing associated with climatic conditions in mountainous regions. According to P.A. Alayyannur & D.H. Ramdhan [7], temperatures rising to 36-42°C during certain months lead to dehydration and bladder irritation. Insufficient water intake and the consumption of mineralised water (particularly with high calcium and sulphate content) place

additional strain on kidney and bladder function. Mountainous terrain increases physical stress in everyday life and contributes to constant mechanical loading of the musculo-ligamentous system. The aim of the study was to determine the prevalence, clinical and epidemiological characteristics, and major risk factors of urinary incontinence among women aged over 35 years living in the southern region of Kyrgyzstan (Osh, Batken, and Jalal-Abad regions).

Materials and Methods

This study was conducted using a cross-sectional observational design and employed a mixed methodological approach incorporating quantitative and qualitative methods. Such a design was aimed at comprehensively assessing the prevalence of urinary incontinence and identifying the clinical-epidemiological and socio-demographic factors associated with this condition among women aged over 35 years living in the southern regions of the Kyrgyz Republic. The study was conducted in Osh, Batken and Jalal-Abad regions of the Kyrgyz Republic under outpatient and primary healthcare settings. A total of 404 women aged over 35 years were enrolled in the study. The mean age of participants was 41.9 ± 6.6 years. The sample was formed using random sampling with consideration of regional affiliation and accessibility of medical care.

The inclusion criteria were: female sex, age over 35 years, permanent residence in the study area for at least 5 years, and voluntary consent to participate in the study. The exclusion criteria included: pregnancy at the time of the survey, malignant tumours of the pelvic organs, severe neurological diseases, and acute infectious conditions. The study was conducted in two stages. During the first stage, a cross-sectional approach was applied to identify early signs of urinary incontinence and pelvic floor dysfunction. A survey and self-administered questionnaire were conducted among women aged over 35 years residing in the southern region of the Kyrgyz Republic (the city of Osh and districts of Osh region, Aidarken city of Batken district, and Mailuu-Suu city of Jalal-Abad region). The survey questionnaire included the following questions: 1) number of childbirths; 2) ratio of term and preterm births; 3) mode of delivery; 4) frequency of major postpartum complications; 5) body mass index category. Women aged over 35 years were included in the survey. All participants independently completed an adapted standardised questionnaire to assess symptoms of urinary incontinence, the functional condition of the pelvic floor, and the impact of this condition on quality of life. The survey instrument was developed on the basis of the ICIQ-SF (International Consultation on Incontinence Questionnaire - Short Form), which is widely used in international practice to assess the presence of urinary incontinence, its frequency, severity and impact on quality of life, and was adapted to the objectives of the study. In addition, an author-developed questionnaire was used, including socio-demographic data, obstetric-gynaecological history (number and outcomes of childbirths, modes of delivery, postpartum complications), somatic status, infections of the genitourinary system, and subjective assessment of climatic and physical loads. Assessment of climatic factors was based on participants' self-reports and included subjective evaluations of the nature of the local climate, frequency of exposure to extreme temperatures (heat, cold, sharp temperature fluctuations), and the impact of climatic conditions on general and reproductive health.

The examination procedure was performed in accordance with standard gynaecological examination rules. Examinations were carried out in a standard gynaecological chair under adequate lighting conditions and using sterile gloves. Initially, a visual assessment of the external genital organs was conducted, followed by a specialised gynaecological examination. All diagnostic and clinical procedures were carried out in compliance with bioethical principles and after obtaining informed voluntary consent from participants. In the clinical part of the study, anthropometric indicators (height and weight) were measured, and based on these data body mass index (BMI, kg/m^2) was calculated and classified in accordance with World Health Organization recommendations. Among women aged over 35 years participating in the study, 310 women reported BMI values. Where necessary, additional information on gynaecological and urological diseases was obtained from participants' outpatient records.

Statistical processing was performed using descriptive statistical methods. Quantitative indicators were presented as mean values and standard deviations (M ± SD), while categorical indicators were expressed as absolute and relative frequencies (%). Pearson's χ^2 criterion was used to assess associations between urinary incontinence and potential risk factors. Statistical significance was accepted at $p < 0.05$. The study was conducted in accordance with bioethical principles and in compliance with the requirements of the Declaration of Helsinki [8]. All participants received full information about the objectives and methods of the study and provided written voluntary informed consent to participate.

Results

Analysis of obstetric indicators demonstrated a high level of parity. Specifically, 55.7% of women had given birth four or more times, 37.4% had given birth two to three times, while 6.7% belonged to the category of women who had given birth once or had never given birth (Table 1). Such high parity was assessed as an important factor creating additional mechanical and physiological burden on the pelvic floor muscles and urinary continence function. A high number of childbirths may increase the risk of development and progression of urinary incontinence.

Table 1. Distribution of women by number of childbirths (≥35 years, n = 404)

Number of childbirths (category)	n	%
0-1 childbirth	27	6.7
2-3 childbirths	151	37.4
≥4 childbirths	225	55.7

Note: the n values presented in the table reflect absolute values (number of women), while percentages (%) represent relative indicators calculated in relation to the total number of respondents participating in the study (n = 404). The categories "0-1 childbirth", "2-3 childbirths", and "≥4 childbirths" are grouped according to the total number of births
Source: compiled by the authors

The distribution of women aged over 35 years included in the study by number of childbirths demonstrated that a high level of parity was characteristic of their obstetric history. Among all respondents: 55.7% (n = 225) were women who had given birth four or more times. This indicator suggests that the trend towards high fertility remains preserved in the region. High parity creates sustained mechanical loading on the pelvic floor muscles and significantly increases the risk of developing urinary incontinence; 37.4% (n = 151) comprised women who had given birth two to three times. This group also belongs to a category with an increased likelihood of developing functional changes in the pelvic floor, although the risk is somewhat lower compared with women with ≥4 childbirths; 6.7% (n = 27) were women who had given birth once or had never given birth. In this group, due to the absence of the mechanical effect of childbirth, the risk of UI may be mainly determined by other factors (hormonal changes, obesity, climatic stressors, comorbid conditions) (Table 2).

Table 2. Ratio of term and preterm births (≥35 years)

Indicator	Number (total)	Share (%)
Term births (37-42 weeks)	1,217	86.7
Preterm births	187	13.3

Note: the table presents the number of term (37-42 weeks) and preterm births. The "Number (total)" column contains absolute indicators (total number of births), while the "Share (%)" column presents relative indicators
Source: compiled by the authors

Analysis of childbirth history among women aged over 35 years demonstrated that the majority of their deliveries occurred within the physiological term period (Table 2). Of all recorded births: 86.7% (n = 1,217) were term births (37-42 weeks). This indicator reflects relatively stable perinatal monitoring and suggests that most women were able to carry pregnancy to later stages. Delivery at physiological term is generally considered a safer outcome for both the newborn and the mother. A total of 13.3% (n = 187) represented preterm births. Preterm birth is a significant medical and social issue because it increases health risks in newborns (respiratory insufficiency, infections, developmental delay). This indicator may be regarded as relatively high for the region and suggests the influence of certain reproductive health risk factors among women (heavy physical labour, dehydration, climatic stressors, gynaecological diseases, delayed access to medical care). Since the question "Types of delivery" allowed multiple answers, different delivery methods may have been combined within one respondent (Table 3).

Table 3. Distribution of delivery methods (≥35 years, n = 404, multiple responses allowed)

Delivery method	Number of women (at least once)	% (of respondents*)
Vaginal (natural) delivery	373	92.3
Caesarean section (planned/emergency)	67	16.6
Operative vaginal deliveries (vacuum, etc.)	2-3	~0.5-0.7

Note: the table presents data on delivery methods. The "Number of women (at least once)" column contains absolute indicators and takes into account that one woman could experience more than one delivery method. The "% (of respondents)" column presents relative indicators calculated in relation to the total number of women participating in the study (n = 404). Therefore, the sum of percentages may exceed 100%
Source: compiled by the authors

Analysis of childbirth history among women aged over 35 years showed that the overwhelming majority had delivered by natural (vaginal) birth. Among all respondents, 92.3% had experienced vaginal delivery at least once. This indicator demonstrates the predominance of vaginal birth in the region, the widespread nature of traditional childbirth practices, and the presence in most women of a delivery route associated with increased functional loading of pelvic structures. Caesarean section was recorded in 16.6%

of women. This indicator reflects the use of surgical delivery according to clinical indications but remains relatively low for the region. This may be explained by delayed access to medical care, limited resources, or the predominance of traditional childbirth practices.

Operative vaginal deliveries (for example, vacuum extraction) were extremely rare, occurring in only 0.5-0.7% of women. The infrequent use of this method may be associated with specialist training, availability of equipment, and in some cases delayed intervention during labour. An important aspect to consider when interpreting the data is that one woman may have experienced several delivery methods; therefore, the total percentages may exceed 100%. This reflects the diversity of delivery methods and the presence of various clinical situations in women's obstetric histories. Overall, this distribution of delivery methods demonstrates the specific characteristics of mechanical loading on the pelvic floor muscles and serves as important epidemiological information for explaining the causes of urinary incontinence. For the question "Did you experience any postpartum complications?", respondents were allowed to select multiple options. The results of analysis conducted among women aged over 35 years were as follows (Table 4).

Table 4. Frequency of major postpartum complications (≥35 years, n = 404)

Postpartum complication	n	%*
No diseases (complications) / None	234	57.9
Perineal tears	119	29.5
Postpartum endometritis	56	13.9
Postpartum haemorrhage	45	11.1
Lactational mastitis	40	9.9

Note: the table presents types of postpartum complications and their frequency. The n value indicates the absolute value (number of women), while % represents a relative indicator calculated in relation to the total number of women participating in the study (n = 404). Since one woman could experience several postpartum complications, the sum of percentages may exceed 100%
Source: compiled by the authors

Analysis of postpartum complications demonstrated a high frequency of traumatic and infectious complications among women aged over 35 years. Although more than half of respondents (57.9%) reported no diseases following childbirth, among the remaining participants:

Perineal tears (29.5%) represented the most common traumatic complication in the region. This may be associated with the high proportion of vaginal deliveries, delivery of large infants, accessibility of obstetric care, and traditional childbirth practices. Endometritis (13.9%) and lactational mastitis (9.9%) as postpartum infections were closely associated with compliance with sanitary-hygienic standards during pregnancy and childbirth, the level of antiseptic measures, and postpartum monitoring.

Postpartum haemorrhage (11.1%) represented a potentially dangerous obstetric condition that may threaten life. These findings confirm that postpartum trauma and infections remain relevant problems in the region. Such complications may lead to long-term consequences including urinary incontinence, pelvic organ prolapse, chronic infections, and weakening of the pelvic floor muscles. The mean body mass index was found to be 25.9 ± 5.2 kg/m^2, indicating wide variation in body weight within this group (Table 5).

Table 5. Distribution of body mass index categories

BMI category	n	%
Underweight (<18.5)	21	5.2
Normal weight (18.5-24.9)	113	28.0
Overweight (25-29.9)	116	28.7
Obesity (≥30)	60	14.9

Note: the table presents body mass index (BMI) categories and their frequency. The n value indicates the absolute value (number of women), while % represents a relative indicator calculated in relation to the total number of women participating in the study (n = 404)
Source: compiled by the authors based on [9,10]

The analysis demonstrated that almost half of women aged over 35 years included in the study – 43.6% – had body weight above normal (overweight and obesity). This condition represents an important factor imposing additional burden on reproductive health and pelvic floor muscle function. Obesity and excess body weight may increase mechanical pressure on the pelvic floor, contribute to elevated intra-abdominal pressure and consequently facilitate impairment of urinary continence. In addition, since obesity is associated with

hormonal imbalance, metabolism disorders, and development of chronic diseases (diabetes, hypertension), it is regarded as an additional risk factor for urinary incontinence. These indicators highlight the need to improve weight control, rational nutrition, physical activity, and accessibility of preventive healthcare among women in the region.

In the gynaecological and urological sections of the questionnaire, women provided information regarding infectious diseases experienced in recent periods. The obtained data were distributed as follows (total respondents = 404). Among respondents, 240 women (35.2%) reported experiencing symptoms of cystitis recently. This indicator demonstrates that lower urinary tract infection occurred in approximately one out of every three women in the studied population. Cystitis is one of the most common infections significantly affecting women's quality of life. A total of 175 women (25.7%) reported symptoms or diagnosis of pyelonephritis. This indicator suggests that some women belonged to a higher-risk group. Pyelonephritis may often develop following cystitis and may also be associated with climatic factors (hot and dry weather), insufficient water intake, heavy physical stress, and weakened immunity. Fifty-three women (7.8%) reported having urethritis. Although this indicator was relatively low, it remains clinically significant, as inflammation of the urethra negatively affects the overall function of the urinary system and may contribute to further progression of infection.

As shown in Figure 1, gynaecological diseases were also widespread among respondents. All of these conditions may act as additional risk factors contributing to worsening of urological symptoms and development of lower urinary tract infections such as cystitis or urethritis. The study identified the following gynaecological pathologies: pelvic inflammatory disease (PID) – 118 women (17.3%), cervicitis – 109 women (16%), vulvovaginitis – 61 women (8.9%), salpingo-oophoritis – 58 women (8.5%), and purulent-inflammatory processes – 45 women (6.6%). The high frequency of these diseases demonstrates that multiple factors simultaneously affect the reproductive and urological health of women in the southern region. In particular, pelvic inflammatory disease (PID), cervicitis, and vulvovaginitis may intensify irritation of the lower urinary tract and contribute to recurrent infections.

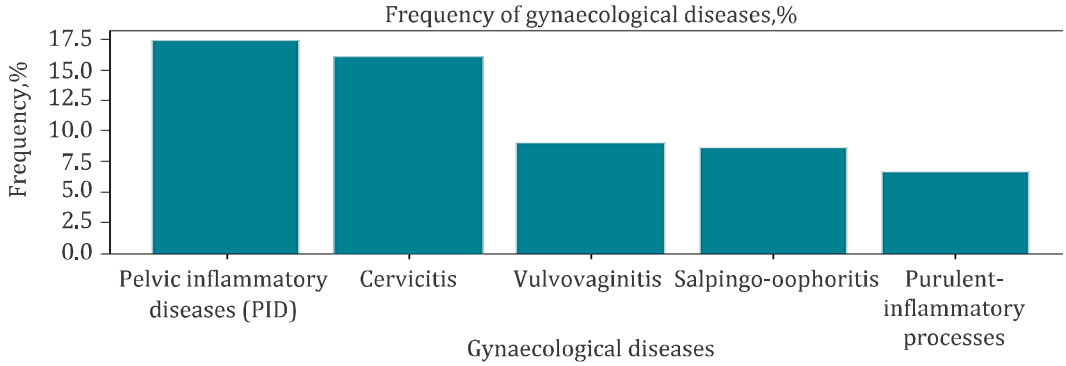


Figure 1. Frequency of gynaecological diseases of the pelvic organs (%)
Source: compiled by the authors

Figure 2 presents the general somatic and vegetative symptoms among women. Among the respondents, urinary incontinence was observed in 129 women (18.9%), while frequent urination was reported by 114 women (16.7%). These two symptoms may reflect the presence of lower urinary tract infections, weakening of the pelvic floor muscles, multiparity, or menopausal hormonal changes. The frequent occurrence of such symptoms indicates that the combined course of urological and gynaecological diseases is widespread.

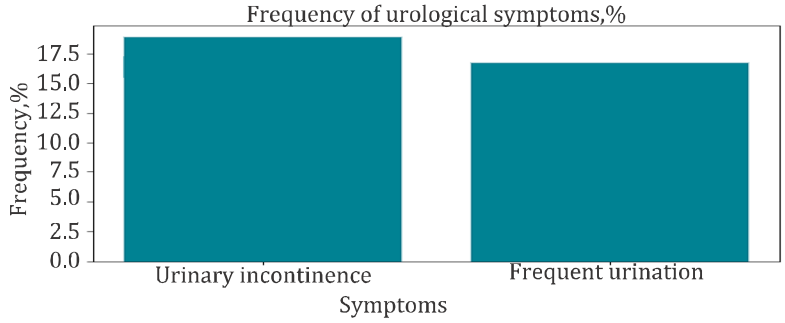


Figure 2. Frequency of urological symptoms (%)
Source: compiled by the author

The frequency of genitourinary system infections, according to the survey results, demonstrated that they are highly prevalent among women. Cystitis was recorded in 240 women (35.2%), indicating that one in three women had inflammation of the lower urinary tract. Pyelonephritis was identified in 175 women (25.7%) and is considered a significant pathology that seriously affects kidney function and often develops following cystitis. The proportion of urethritis was relatively lower – 53 women (7.8%), but its clinical significance remained high. The symptom structure also reinforces the relevance of these infections: urinary incontinence was observed in 18.9% of respondents, while 16.7% reported frequent urination. These symptoms may be closely associated with UI, pelvic floor muscle dysfunction, and menopausal hormonal changes. The responses of women aged over 35 in the survey showed that climatic conditions in their area of residence vary considerably. Among respondents, 42.1% described the climate as "warm", noting that winters in these areas are mild, while summer temperatures often exceed +30°C. The remaining participants described the climate as "moderate" (28.0%) or "cold" (25.7%), indicating either a clearly defined four-season climate or the presence of long, cold winters. Humid climate was reported by 2.7%, while only 1.5% of women lived in a dry climate, demonstrating that such climatic zones were rare in the studied cohort.

The analysis of exposure frequency to extreme climatic factors also showed interesting results. A total of 35.4% of women reported being exposed to harsh climatic conditions daily. Another 23.5% indicated that they were rarely exposed to such factors, 22.0% experienced them several times per month, and 13.6% several times per week. Only 5.4% of women stated that they were never exposed to extreme climatic factors. These findings indicate that more than one-third of women live under daily climatic stress conditions and that such exposure may indirectly affect their health, including reproductive and urological functions. The data obtained regarding the impact of climate on reproductive health provide important insight into how women associate climatic conditions with their own health. A total of 40.1% of respondents stated that changes in climate lead to substantial deterioration in reproductive health. According to them, sharp warming, cold weather, and unstable temperature fluctuations affect menstrual cycle disturbances, exacerbation of inflammatory processes in the reproductive organs, and worsening of general gynaecological symptoms. A further 22.8% of women stated that climate has an effect, but that it is relatively mild in nature.

Meanwhile, 37.1% of respondents reported no association between climatic factors and deterioration of reproductive health. This group may associate symptoms with other causes or reside in regions where climatic changes are less noticeable. The statistical analysis performed confirmed a statistically significant association between climatic conditions and reproductive health ($\chi^2 = 66.5$; $p < 0.001$). In particular, women who assessed their health as "poor" more frequently reported negative climatic effects, suggesting that their symptoms may be sensitive to climatic factors.

Discussion

The results of this study confirm that urinary incontinence (UI) remains a relevant and insufficiently diagnosed medical and social problem among women aged over 35 living in the southern regions of the Kyrgyz Republic. The prevalence of UI symptoms was 18.9%, which is consistent with data obtained in developing countries, where prevalence varies between 15% and 30%. T. Ishimaru *et al.* [10], in a study of the prevalence of overactive bladder (OAB) symptoms (including those accompanied by urinary incontinence) among the elderly population in Japan, identified an overall prevalence of 16.4% and demonstrated that cold climatic factors (for example, indoor temperature <12°C) increase the risk of OAB. The mean age of respondents was 41.9 years, which corresponds to the period when reproductive function declines while chronic diseases simultaneously become more frequent, and is consistent with the findings of Y. Aoki *et al.* [11]. According to obstetric history, most women demonstrated a high level of parity: more than half of respondents (55.7%) had given birth four or more times. Such high parity places a persistent mechanical load on the pelvic floor muscles and contributes to impaired urinary continence function. At the same time, Zh. Abdirasulova *et al.* [12], taking into account the climatic, social, and cultural characteristics specific to southern Kyrgyzstan, suggested that this figure may not fully reflect the actual situation and may be underestimated.

According to research by the World Health Organization, one of the main risk factors associated with the development of UI in the population was high parity. More than half of participants (55.7%) had given birth four or more times, which is substantially higher compared with population-based studies conducted in European countries. As noted by E.V. Mudrakovskaia *et al.* [13], multiple childbirths lead to cumulative damage to the muscular and ligamentous structures of the pelvic floor, impaired innervation, and reduced supportive function. This process represents a proven mechanism for the development of stress and mixed forms of UI. The obtained data are consistent with findings from long-term cohort studies demonstrating that the risk of UI increases with the number of vaginal deliveries. The predominance of vaginal (natural) deliveries in the study (92.3%) reflects the dominance of traditional obstetric practices in the region and the limited use of operative delivery methods. Although natural childbirth has physiological advantages, insufficient postpartum rehabilitation contributes to the development of pelvic floor injuries and subsequent dysfunction.

As reported by M.H. Al Kiyumi *et al.* [14], age-related and hormonal changes also play a significant role in the pathogenesis of UI. The average age of women participating in the study was 41.9 years, corresponding to the perimenopausal period. These changes are characteristic of the genitourinary syndrome of menopause and lead to urinary disorders, as widely described in clinical and epidemiological studies. In addition, according to D.J. Portman & M.L.S. Gass [15], decreased oestrogen levels during perimenopause and menopause impair trophic support of the urethral and bladder mucosa, resulting in thinning and dryness. Oestrogen deficiency contributes to the reduction of the submucosal vascular network responsible for urethral closure function and decreases receptor sensitivity. These hormonal changes deepen pelvic floor muscle weakening and substantially increase the likelihood of developing urinary incontinence, particularly stress and mixed forms. Overweight and obesity were also identified as important modifiable risk factors in this study. As noted by S. Mørkved & K. Bø [16], 43.6% of women had body weight above the normal range. In obesity, persistently elevated intra-abdominal pressure places additional strain on the pelvic floor muscles and impairs urethral closure function, which is closely associated with the development of stress UI. Based on the studies of D.H. Thom & G. Rortveit [17], chronic bronchitis and prolonged coughing may also increase intra-abdominal pressure and exacerbate stress incontinence. Furthermore, according to the World Health Organization (WHO), obesity is accompanied by metabolic and inflammatory processes that impair neuromuscular regulation.

The high prevalence of genitourinary infections identified in the study also deserves particular attention. Cystitis (35.2%), pyelonephritis (25.7%), and urethritis (7.8%) were widespread. S.H. Almukhtar [18] noted that chronic and recurrent infections lead to detrusor irritation, frequent urination, and increased urgency symptoms. A distinctive feature of this study was the assessment of climatic stress as an independent and significant background factor. A statistically significant association was identified between climatic conditions and deterioration in urinary and reproductive health ($\chi^2 = 66.5$; $p < 0.001$). As stated in the national clinical protocols of the Ministry of Health of the Kyrgyz Republic for diagnosing and treating genitourinary tract infections in women, this result corresponds with findings from international studies by J.S. Hu & E.F. Pierre [19], which demonstrated the influence of elevated temperatures and cold air on bladder function.

Socio-cultural factors also significantly affect disease detection. Stigma associated with urinary incontinence and insufficient awareness hinder women from seeking medical care at an early stage. Similar findings have also been reported in studies conducted in Central Asia and the Middle East, particularly in the study by M.A.S. Alhamoud *et al.* [20]. Several limitations of the study should be acknowledged. The cross-sectional design does not allow determination of causal relationships. Data based on self-assessment may lead to information bias. According to L.C.G. Jensen *et al.* [21], the absence of urodynamic investigations did not allow precise differentiation of UI types; however, the use of the validated ICIQ-SF questionnaire increases the reliability of the obtained data. Overall, the findings of this study indicate the need to develop regionally adapted programmes for the prevention and early detection of urinary incontinence among women aged over 35 in the southern regions of Kyrgyzstan. Such programmes should include training in pelvic floor muscle strengthening exercises, body weight management, timely treatment of genitourinary infections, and improving awareness among primary healthcare personnel.

Conclusions

The conducted study made it possible to comprehensively assess the prevalence of urinary incontinence among women aged over 35 living in the southern regions of the Kyrgyz Republic, as well as to identify the main clinical-epidemiological and region-specific risk factors contributing to the development of this pathology. The findings demonstrated that symptoms of urinary incontinence were identified in 18.9% of women, indicating that this problem has substantial medical and social significance for women's health in the region. One of the main factors contributing to the development of urinary incontinence is high parity. More than half of the respondents were found to have given birth four or more times, confirming that this leads to cumulative mechanical loading of the muscular and ligamentous structures of the pelvic floor and weakening of their supportive function. The predominance of vaginal deliveries and the high frequency of postpartum injuries emphasise the need to improve obstetric care and broadly introduce postpartum rehabilitation programmes.

Age-related and hormonal changes characteristic of the perimenopausal and menopausal periods also make a substantial contribution to the development of urinary incontinence. Reduced oestrogen levels lead to atrophic changes in the mucous membrane of the urethra and bladder, weakening urinary continence mechanisms. When combined with previous childbirths and obstetric injuries, these changes significantly increase the risk of developing stress and mixed forms of urinary incontinence. The study identified overweight or obesity in 43.6% of women, and this factor was assessed as an important modifiable risk factor for urinary incontinence. In obesity, persistent elevation of intra-abdominal pressure exerts additional force on the pelvic floor muscles and contributes to impaired urinary continence function. In addition, the high frequency of genitourinary infections leads to

worsening urinary symptoms and deterioration in women's quality of life. A distinctive feature of this study was the demonstration of a statistically significant impact of climatic stress on urinary and reproductive health. The hot and dry climate characteristic of the southern regions, dehydration, and physical workloads should be considered additional factors increasing the risk of urinary incontinence. In conclusion, urinary incontinence among women aged over 35 in the southern regions of Kyrgyzstan has a multifactorial nature and requires a comprehensive and regionally adapted approach. The obtained data support the need to develop and implement programmes aimed at early detection, prevention, and preservation of women's health at the level of primary healthcare services.

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Conflict of Interest

None.

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Корутунду. Бул изилдөөнүн максаты Кыргыз Республикасынын түштүк региондорунда (Ош, Баткен жана Жалал-Абад облустары) жашаган 35 жаштан жогору аялдар арасында уринардык инконтиненциянын таралышын, клиникалык-эпидемиологиялык өзгөчөлүктөрүн жана негизги тобокелдик факторлорун аныктоо болуп саналат. Изилдөө кросс-секциондук дизайнда жүргүзүлүп, сандык жана сапаттык ыкмаларды камтыган аралаш методология колдонулган. Изилдөөгө 35 жаштан жогору 404 аял катышкан (орточо жашы – 41,9 ± 6,6 жаш). Маалыматтарды чогултуу ICIQ-SF стандартизделген суроо барагы, клиникалык кароо, акушердик-гинекологиялык жана соматикалык анамнезди талдоо аркылуу жүргүзүлгөн. Статистикалык иштетүү сүрөттөөчү статистика жана χ^2 критерийи менен ассоциацияларды баалоону камтыган; $p < 0,05$ маанилүү деп эсептелген. Кыргызстандын түштүк региондорунда изилдөөгө катышкан аялдардын 55,7%ында төрт жана андан көп төрөт болгон, ошондой эле метоболикалык бузулуулардын көрсөткүчү болгон ашыкча салмак же семирүү 43,6%ында аныкталган. Заара-жыныс системасынын инфекциялары кеңири тараган: цистит – 35,2%, пиелонефрит – 25,7%, уретрит – 7,8%. Уринардык