

Sociodemographic and Clinical Correlates of Urinary Incontinence in Women

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Abstract

Women's health is significantly impacted by urinary incontinence, which is a common health condition among women and affects physical comfort, functioning and quality of life. Urinary incontinence is a common women's health issue that is linked with physical and psychological discomfort, social restrictions and a diminished quality of life. The aim of this study was to investigate the sociodemographic and clinical characteristics of urinary incontinence in women and to assess the short-term changes in urinary symptoms and function over 4 weeks. We used a quantitative longitudinal analytical approach with 40 women with urinary incontinence complaints. Data on sociodemographic and clinical history, baseline measures of urinary symptoms, total score of ICIQ-SF and measures of strength and endurance of pelvic and abdominal muscles from pre-test to week 4 were analysed. Participant characteristics, symptom patterns, and their changes were described and compared. The study found that the study population was middle aged, urban, married housewives with a generally obese BMI. The most prevalent diseases were hypertension and diabetes. The women showed moderate severity of urinary incontinence with predominant leakage during sneezing or coughing at baseline, suggesting a stress urinary incontinence pattern. Urinary symptoms improved substantially after four weeks, as measured by decreased frequency, volume, interference in daily life and ICIQ-SF total score. Pelvic function also improved, reflecting changes in pelvic strength, abdominal muscle strength, pelvic floor endurance and abdominal muscle endurance. This research suggests that urinary incontinence in women should be evaluated as a composite of symptom severity, clinical characteristics and pelvic function.

Keywords: urinary incontinence, women, pelvic floor muscle strength, ICIQ-SF, functional recovery

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1. Introduction

Urinary incontinence is a distressing and prevalent condition in women and has been identified as a significant public health issue due to its physical, psychological and social impacts. It occurs in women of all ages but is more prevalent and severe as women age, have given birth, and have other clinical co-morbidities. It's not only manifest as involuntary leaking of urine but is also associated with feelings of shame and loss of self-esteem, limitation of activities, sleep disruption and quality of life. These profound impacts have led to an increased interest in urinary incontinence as a clinical condition but also with a sociodemographic background, risk factors, and pelvic function.

Recent research has demonstrated that urinary incontinence is common and has numerous interrelated factors. Xu et al. (2021) found that urinary incontinence in women aged 50-70 years old was linked to several sociodemographic and clinical risk factors, and the need to explore background and clinical predictors was highlighted. Likewise, Wang et al. (2023) in a large-scale epidemiological survey of women, found female urinary incontinence has a significant impact on quality of life, and is influenced by a mix of biological, reproductive and lifestyle factors. These results indicate that urinary incontinence must be understood not only from the description of the symptoms, but also in relation to the pattern and severity of symptoms in the context of sociodemographic and clinical characteristics.

Besides its epidemiology, urinary incontinence has been the subject of many studies on conservative treatment, particularly pelvic floor muscle training. Cacciari et al. (2019) noted that this is still one of the most effective non-surgical options in women with urinary incontinence, compared with non-treatment or placebo treatments. Similarly, Vaz et al. (2019) demonstrated that pelvic floor muscle training, in association with bladder training, can be beneficial in women in primary care settings. Both studies highlight the importance of functional assessment and monitoring in the clinical management of urinary incontinence among women.

Other studies have reinforced the use of pelvic floor muscle training in women. Yang et al. (2022) reported the beneficial effects of group pelvic floor muscle training in preventing and treating urinary incontinence in pregnant and recently given birth women, demonstrating the potential for a follow-up assessment of intervention effects. Similarly, Mihaľová et al. (2022) also found pelvic floor muscle training to be effective in older women, especially for urinary urgency and function. The field has recently evolved to digital and technology-based care. Kamali et al. (2023) reported that e-pelvic floor muscle training was beneficial for women with stress urinary incontinence while Janela et al. (2024) showed that digital care programs could be used to manage urinary incontinence on a population scale. Likewise, Vilela et al. (2024) demonstrated that pelvic floor training via mobile application is effective

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in improving urinary symptoms in women with stress urinary incontinence. These studies suggest that urinary incontinence symptoms respond to functional rehabilitation and that serial assessment of urinary symptoms and pelvic function are key to assessing treatment responses.

Urinary incontinence not only affects the severity of symptoms, but also quality of life. Curillo-Aguirre and Gea-Izquierdo (2023) found that pelvic floor muscle training is a key factor to improving quality of life in women with urinary incontinence. This is important because the alleviation of symptoms is not only a clinical outcome but is also important for the recovery of function, self-esteem and social integration. So, for urinary incontinence research, it would be desirable to include symptom severity and related quality of life in the analysis (Marcellou et al., 2025).

Although the literature is increasing in the prevalence of urinary incontinence, the risk factors associated with the condition, and the effect of treatment, there is still a need for smaller clinical data sets that allow concurrent examination of the participants' background, baseline severity of urine incontinence and short-term changes in symptoms (Bugge et al., 2024). While epidemiological studies tend to focus on large sample prevalence and risk factor estimation, and intervention studies tend to emphasise treatment effects without providing complete sociodemographic and clinical descriptions of participants. This makes it worthwhile to study datasets that can be used to simultaneously examine participant background, baseline symptom profile and short-term changes in clinical and functional outcomes.

Our current study responds to this by analysing women with urinary incontinence using a data set that includes sociodemographic measures, medical history, baseline measures of urinary symptoms, and follow-up measures. In doing so, it allows us to profile the participant, the baseline profile of urinary incontinence, short-term changes in urinary symptom severity and measures of function, and the association between selected participant characteristics and the severity of urinary incontinence. In doing so, this study adds to the understanding of sociodemographic and clinical aspects of women's urinary incontinence. The objectives of the study are:

1. To examine the sociodemographic and clinical characteristics of women with urinary incontinence.
2. To assess the baseline pattern and short-term changes in urinary incontinence symptoms and functional measures from pre-test to week 4.
3. To explore the relationship between selected baseline participant characteristics and urinary incontinence severity in women.

2. Methodology

2.1 Research Design

A quantitative longitudinal analytical study design was used to investigate the relationship between sociodemographic and clinical factors associated with urinary incontinence in women, and to observe the pattern of urinary incontinence symptom severity over a four-week period in the current study. The aim of the

study was to determine the association between baseline characteristics and clinical outcomes of urinary incontinence. The study sought to determine the short-term progression of urinary incontinence symptoms comparing repeated measurements at baseline and weekly intervals. This study was empirical, where the data variables were organised to investigate patterns of urinary incontinence symptoms and its relationship with certain sociodemographic and clinical variables.

2.2 Data Source and Sample

This study used the Urinary Incontinence dataset created by Hossain (2021). This dataset included 40 observations of 40 women with urinary incontinence symptoms. Information on sociodemographic characteristics, medical history, and symptom measures were collected. Baseline measurements were complemented with repeated measurements of symptoms and functional measures at week 1, week 2, week 3 and week 4. Since the dataset included complete data for all women in the study, all observations were used in the analysis.

2.3 Variables and Measures

The dependent variables in this study were clinical measures of urinary incontinence, such as frequency of urine leakage, quantity of leak, impact on daily life, the condition or time of urine leak, and the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF) total score. These described the severity and quality of life impairment of urinary incontinence, and were also measured weekly during follow-up to evaluate the change over time.

The independent variables were the baseline sociodemographic and clinical variables. Sociodemographic characteristics included age, residence, occupation, marital status, family size, number of children, educational level and religious background. Clinical factors included height, weight, medical history, symptom duration, surgery history, pelvic muscle strength, abdominal muscle strength, pelvic muscle endurance and abdominal muscle endurance. Overall, these variables defined the participants' sociodemographic and clinical characteristics.

2.4 Data Processing and Preparation

The data were checked for research readiness prior to analysis. Missing values, duplicate observations and structural problems were checked and no significant issues were identified. The naming and labeling of variables were checked to understand the coding strategy and definition of each variable of interest. Small inconsistencies in naming of repeated measures per week were corrected to facilitate comparison over time. Categorical data were grouped in accordance with the response options and continuous data were left in their original numerical format. Also, the body mass index (BMI) was derived from height and weight to improve the clinical profiling of the participants.

2.5 Data Analysis Technique

We performed the data analysis in three steps to assess the participant characteristic and clinical feature of urinary incontinence. Initially, descriptive statistics were used to describe the characteristics of the data set. For continuous variables, we used mean and standard deviation, and in the case of categorical variables, we used frequency and percentage. This gave a description of the participants' sociodemographic and clinical characteristics.

Then, changes in symptom severity and function between baseline and week 4 were analysed. This involved pelvic strength, abdominal muscle strength, pelvic floor endurance, abdominal muscle endurance, frequency of leakage, volume of leakage, impact on daily life, and the ICIQ-SF score. This allowed us to determine the short-term effects of urinary incontinence symptoms. Lastly, sociodemographic characteristics

(age, living area, marital status and educational status) and clinical characteristics (number of children, past medical history and surgery history) at baseline were examined in relation to the severity of urinary incontinence.

3. Results

3.1 Participant Characteristics

We analysed 40 women. The participants were mostly middle-aged (mean age 48.33 years) and overweight (mean body mass index (BMI) 27.32 kg/m²). The women had a mean number of children (parity) of 3.02 and the mean duration of symptoms was 139.53, with a high degree of variability. The mean ICIQ-SF total score at baseline (10.00) indicated moderate severity of urinary incontinence is showed in Table 1.

Table 1. Descriptive statistics of continuous variables

Variable	Mean	SD	Min	Max
Age (years)	48.33	12.04	24.00	75.00
BMI (kg/m ²)	27.32	2.89	22.48	35.30
Children (n)	3.02	1.66	1.00	8.00
Duration of symptoms	139.53	152.87	4.00	520.00
ICIQ-SF total (pre-test)	10.00	2.56	6.00	14.00

3.2 Sociodemographic and Clinical Background

Most of the participants were urban (67.5%), housewives (82.5%) and married (75.0%). The level of education was mainly concentrated in secondary education (40.0%), followed by primary and illiteracy. Health-wise, hypertension (47.5%) and diabetes (35.0%)

were the most common health issues, and 45.0% were post-surgery. This suggests that urinary incontinence was more prevalent among urban, married women with other significant medical conditions, as shown in Table 2.

Table 2. Sociodemographic and clinical profile of participants

Variable	Category	n (%)
Living area	Urban	27 (67.5)
	Rural	13 (32.5)
Occupation	Housewife	33 (82.5)
	Service holder	5 (12.5)
	Teacher	2 (5.0)
Marital status	Married	30 (75.0)
	Widow	9 (22.5)
	Divorce	1 (2.5)
Educational status	Secondary	16 (40.0)
	Primary	8 (20.0)
	Illiterate	7 (17.5)
	Graduate & masters	5 (12.5)
	HSC passed	4 (10.0)
Past medical history	Hypertension	19 (47.5)
	Diabetes	14 (35.0)
	More than one condition	6 (15.0)
	Others	1 (2.5)
Surgery history	Yes	18 (45.0)
	No	22 (55.0)

3.3 Baseline Urinary Incontinence Severity and Symptom Pattern

Baseline symptoms revealed a significant symptom burden. A leak several times a day was reported by 35.0% of participants and 55.0% reported a large quantity of leakage, suggesting that the severity of the

symptoms was not restricted to occasional leakage. Sneezing and coughing was the most common leakage trigger (80.0%) and this is consistent with stress urinary incontinence. So, the baseline results reflect both the severity of the symptoms and the presence of stress

urinary incontinence (Table 3). As illustrated in Figure 1, all the functional measures improved over time.

Table 3. Baseline urinary incontinence pattern

Variable	Category	n (%)
Frequency of leakage	About once a week or less often	10 (25.0)
	Two to three times a week	9 (22.5)
	About once a day	6 (15.0)
	Several times a day	14 (35.0)
	All the time	1 (2.5)
Amount of leakage	Minimum amount	18 (45.0)
	Large amount	22 (55.0)
Timing/condition of leakage	Coughing or sneezing	32 (80.0)
	Physical activity/exercise	5 (12.5)
	After urination and dressing	3 (7.5)

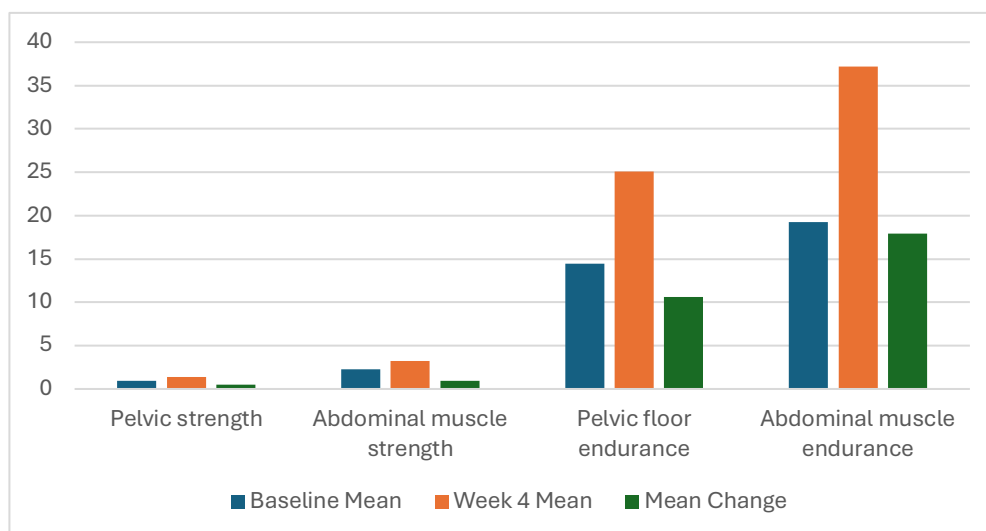


Figure 1. Comparison of functional measures at baseline and week 4

3.4 Changes in Functional Measures, Symptom Severity, and Baseline Correlates

Most symptom and function measures improved significantly from baseline to week 4. The mean ICIQ-SF total score improved from 10.00 to 4.48, along with leakage frequency, amount of leakage and interference in daily life. Concurrently, pelvic and abdominal muscle

strength and endurance showed improvement, suggesting functional improvement. The severity of baseline symptoms did not vary by age, BMI, location, marital status, education, surgery, and medical history, but varied slightly by number of children. These results are shown in Table 4 and the symptom trend is shown in Figure 2.

Table 4. Baseline to week 4 changes and baseline correlates of urinary incontinence severity

Variable	Baseline / Observation	Week 4 / Interpretation
Pelvic strength	0.93	Improved to 1.40
Abdominal muscle strength	2.30	Improved to 3.25
Pelvic floor endurance	14.45	Improved to 25.08
Abdominal muscle endurance	19.28	Improved to 37.20
Frequency of urine leakage	2.68	Reduced to 1.30
Amount of urine leakage	3.10	Reduced to 1.13
Interference with daily life	3.85	Reduced to 2.00
ICIQ-SF total score	10.00	Reduced to 4.48

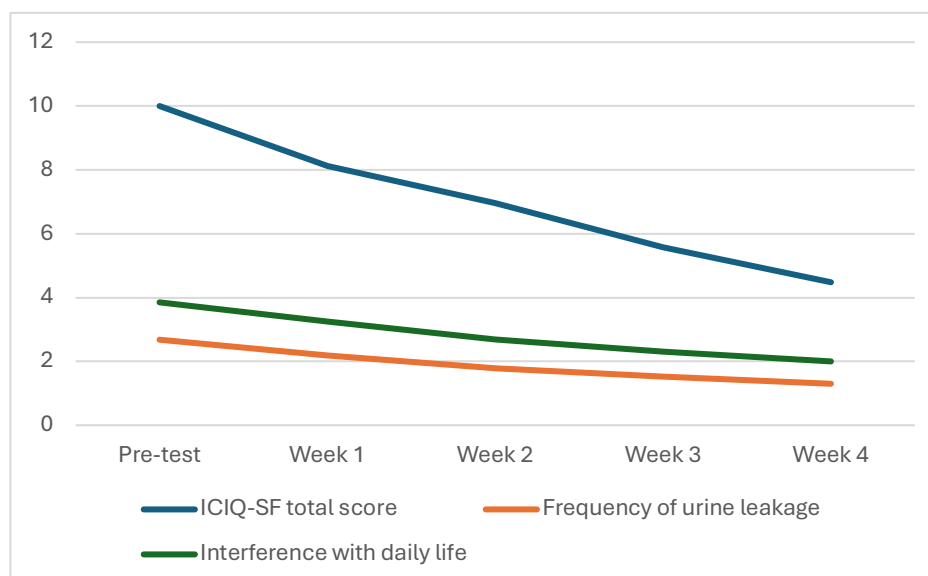


Figure 2. Trend in urinary incontinence symptom measures across follow-up

4. Discussion

The problem of urinary incontinence in women is a multifactorial problem that depends on age, history of reproductive activities, body composition, and presence of other clinical conditions, in addition to causing a significant burden to daily functioning and quality of life. The results of this study suggest the medium level of baseline urinary incontinence severity, the sympathetic pattern of symptom leakage, obvious short-term changes in symptom burden and functional outcomes, and only slight changes in the baseline severity irrespective of most of the sociodemographic and clinical background factors.

The profile of the participants corresponds to the previous findings that urinary incontinence is a common problem of middle-aged women, which is often related to the reproductive and health aspects. The average age, parity and the BMI suggests a population at risk due to cumulative stress on their pelvic floor that could lead to urinary symptoms with age. This concurs with the findings of Xu et al. (2021) who found that urinary incontinence in women aged 50-70 years is linked to a variety of risk factors and it should be viewed in the broader demographic and clinical context. The same trend was outlined by Wang et al. (2023) that discovered that female urinary incontinence is conditioned by combining a set of biological and lifestyle-related factors and affects daily life significantly. In this way, the profile of the participants allows affirming that urinary incontinence is not merely a single symptom that exists in isolation but a problem that is interwoven in the broader social and clinical context of women.

This interpretation is further supported by the pattern of symptoms that the patient has as a baseline. The average ICIQ-SF total ICIQ-SF indicated a moderate severity rate, and the distribution of the symptoms categories indicated that lots of women were having recurrent leakage and significant interference with daily life. The large percentage of leakage provoked by coughing and sneezing are a great indication of a stress urinary incontinence pattern. This correlates with Abushamma

et al. (2024), who pointed out that urinary incontinence tends to have an impact on the quality of life of women and manifests itself in its forms, which disrupt the daily work of the body. The findings at the baseline thus indicate that there were clinical implications of the condition that the women in this sample were undergoing which had real life implications.

The most significant observation is the significant improvement that was recorded between the baseline and week 4. Follow-up findings of decreased ICIQ-SF total score, frequency of leakage, volume of leakage and disruption of normal life are all signs that there is a distinct improvement in the severity of urinary incontinence. Meanwhile, pelvic strength, abdominal muscle strength, pelvic floor endurance and abdominal muscle endurance improved indicating that symptom reduction was accompanied by functional recovery that was quantifiable. The concomitant reduction in the symptoms and muscular performance supports the perception that pelvic floor-oriented rehabilitation is able to yield clinically significant effects.

The findings are also in line with other intervention based studies. Vaz et al. (2019) proved that combining the use of pelvic floor muscle training with bladder training can lead to better results with urinary incontinence in primary care departments. Similarly, Curillo-Aguirre and Gea-Izquierdo (2023) concluded that pelvic floor muscle training greatly improves the quality of life in urinary incontinent women. The decreases in symptom burden found here are therefore not only likely to be due to numerical improvement, but also to improved daily comfort, confidence, functional independence.

Another way of interpreting the increase in muscle strength and endurance is due to the well-known treatment mechanisms. Sheng et al. (2022) described that pelvic floor muscle training can enhance continence by enhancing muscle strength, improving pelvic support, and providing better muscle timing of responding to abdominal pressure increases. This description is particularly descriptive as coughing and sneezing were

the primary instigators of leakage in the baseline. Better pelvic and abdominal support might thus have a direct impact in decreasing stress-induced urine loss. This trend is consistent with this explanation, with functional measures improving concomitant with a decrease in urinary symptoms.

The other noteworthy result is that the correlation between baseline background characteristics and severity of urinary incontinence is rather weak. Age, BMI, residence, marital status, educational status, history of surgeries, and previous medical history did not exhibit any noticeable variation with respect to baseline ICIQ-SF score though the number of children had slightly varied. This is not to be taken as an indication that these factors are insignificant. Instead, it could be indicative of the small sample size and a clinical nature of the data. The results of larger studies, including the ones by Torres et al. (2025), were clearer in their association of urinary incontinence with obstetric or age-related factors. However, in a smaller clinical sample, functional pelvic measures and symptom scores, perhaps, more accurately reflect severity compared to background characteristics.

5. Conclusion

Women who experience urinary incontinence should be viewed as not merely a symptom-related condition but be viewed as the functional health condition that can be influenced by pelvic support, reproductive history, and living conditions. This study shows that, women in this sample had a significant baseline burden of urinary incontinence especially stress-related leakage but also showed evident short-term change in the severity of the symptoms and functional capacity throughout the follow-up. This trend implies that urinary incontinence may not be a fixed condition; it is a condition that can be altered, in case clinical focus is on pelvic floor functioning and associated physical healing. A key finding of this investigation is that direct clinical and functional measures seemed to be more informative than the majority of the sociodemographic variables at the baseline to describe the level of urinary incontinence in this sample. Although age, BMI, marital status, education, and medical history were also significant contextual factors, the most significant changes were reflected by the scores of the symptoms, and the positive changes in muscle strength and endurance. This shows the importance of the integration of participant profiling and repeated functional assessment as opposed to background characteristics alone. The research hence justifies the applicability of the early identification, systematic follow up and pelvic floor focused treatment in women with urinary incontinence.

References

1. Abushamma, F., Mansour, A., Nassar, R., Badran, H., Alwafa, R. A., Ktaifan, M., ... & Zyoud, S. E. H. (2024). Prevalence, risk factors, and impact on quality of life due to urinary incontinence among Palestinian women: a cross-sectional study. *Cureus*, 16(4).
2. Bugge, C., Hay-Smith, J., Hagen, S., Grant, A., Taylor, A., & Dean, S. (2024). Pelvic floor muscle training for female urinary incontinence: development of a programme theory from a longitudinal qualitative case study. *BMC women's health*, 24(1), 478.
3. Cacciari, L. P., Dumoulin, C., & Hay-Smith, E. J. (2019). Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women: a cochrane systematic review abridged republication. *Brazilian journal of physical therapy*, 23(2), 93-107.
4. Curillo-Aguirre, C. A., & Gea-Izquierdo, E. (2023). Effectiveness of pelvic floor muscle training on quality of life in women with urinary incontinence: a systematic review and meta-analysis. *Medicina*, 59(6), 1004.
5. Hossain, K. M. A. (2021). *Urinary incontinence: Effect of max rep of pelvic floor stabilization exercise in SUI* [Data set]. Kaggle. <https://www.kaggle.com/datasets/kmamranhossain/urinary-incontinence>
6. Janela, D., Areias, A. C., Molinos, M., Moulder, R. G., Magalhães, I., Bento, V., ... & Costa, F. (2024, January). Digital care program for urinary incontinence in females: a large-scale, prospective, cohort study. In *Healthcare* (Vol. 12, No. 2, p. 141). MDPI.
7. Kamalı, S., Özengin, N., & Topçuoğlu, M. A. (2023). The effect of e-pelvic floor muscle training on symptoms in women with stress urinary incontinence: a randomized controlled trial. *Women & Health*, 63(6), 473-483.
8. Marcellou, E. G., Stasi, S., Giannopapas, V., Bø, K., Bakalidou, D., Konstadoulakis, M., & Papatheanasiou, G. (2025). Effect of pelvic floor muscle training on urinary incontinence symptoms in postmenopausal women: A systematic review and meta-analysis. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 304, 134-140.
9. Mihaľová, M., Hagořská, M., Oravcová, K., Martínářková, N., Grus, C., & řvihra, J. (2022). Pelvic floor muscle training, the risk of falls and urgency urinary incontinence in older women. *Zeitschrift für Gerontologie und Geriatrie*, 55(1), 51-60.
10. Sheng, Y., Carpenter, J. S., Ashton-Miller, J. A., & Miller, J. M. (2022). Mechanisms of pelvic floor muscle training for managing urinary incontinence in women: a scoping review. *BMC women's health*, 22(1), 161.
11. Torres, C. S., Esparza, K. G., & Celi, V. A. (2025, December). Urinary Incontinence and Its Relationship with Obstetric, Age, and Ethnic Factors: A Cross-Sectional Study. In *Healthcare* (Vol. 13, No. 24, p. 3254). MDPI.
12. Vaz, C. T., Sampaio, R. F., Saltiel, F., & Figueiredo, E. M. (2019). Effectiveness of pelvic floor muscle training and bladder training for women with urinary incontinence in primary care: a pragmatic

- controlled trial. *Brazilian journal of physical therapy*, 23(2), 116-124.
13. Vilela, I. D. C., Silva, N. M. B., Pinto, R. D. M. C., Driusso, P., & Pereira-Baldon, V. S. (2024). Effects of using a mobile application on pelvic floor training in women with stress urinary incontinence: A randomized controlled clinical study. *Neurourology and Urodynamics*, 43(8), 1997-2004.
 14. Wang, Q., Que, Y. Z., Wan, X. Y., & Lin, C. Q. (2023). Prevalence, risk factors, and impact on life of female urinary incontinence: an epidemiological survey of 9584 women in a region of southeastern China. *Risk Management and Healthcare Policy*, 1477-1487.
 15. Xu, C., Chen, M., Fu, J., Meng, Y., Qin, S., & Luo, Y. (2021). Urinary incontinence status and risk factors in women aged 50–70 years: a cross-sectional study in Hunan, China. *International Urogynecology Journal*, 32(1), 95-102.
 16. Yang, X., Zhang, A., Sayer, L., Bassett, S., & Woodward, S. (2022). The effectiveness of group-based pelvic floor muscle training in preventing and treating urinary incontinence for antenatal and postnatal women: a systematic review. *International urogynecology journal*, 33(6), 1407-1420.