Original Article

Journal of Iranian Medical Council, Volume 9, Issue no. 4
http://dx.doi.org/10.18502/jimc.v9i4.22452

The Relationship between Pelvic Organ Prolapse Stage and Urinary Incontinence

Fateme Salahshour[1], Sajad Moosavi[1], Zahra Mostafavian[2] and Taraneh Mohajeri[3]*

1. Innovative Medical Research Center, Faculty of Medicine, Mashhad Medical Sciences, Islamic Azad University, Mashhad, Iran
2. Department of Community Medicine, Mashhad Medical Sciences, Islamic Azad University, Mashhad, Iran
3. Department of Gynaecology, Mashhad Medical Sciences, Islamic Azad University, Mashhad, Iran

*** Corresponding author**
Taraneh Mohajeri, MD
Department of Gynaecology, Mashhad Medical Sciences, Islamic Azad University, Mashhad, Iran
Tel: +98 9155175564
Fax: +98 51 3225 0041
Email:
Dr.taraneh57@gmail.com

Received: 24 Apr 2025
Accepted: 16 Oct 2025

Citation to this article
Salahshour F, Moosavi S, Mostafavian Z, Mohajeri T. The Relationship between Pelvic Organ Prolapse Stage and Urinary Incontinence. *J Iran Med Counc*. 2026;9(4):862-9.

Abstract

Background: Pelvic Organ Prolapse (POP) and Urinary Incontinence (UI) are common pelvic floor disorders and significant healthcare concerns that significantly affect womens quality of life. Urinary incontinence is classified into several types: Urgency Urinary Incontinence (UUI), Stress Urinary Incontinence (SUI), and Mixed Urinary Incontinence (MUI), which involves features of both types. Prevalence of UI increases with age, affecting multiple aspects of patients' lives. Given the frequent coexistence of POP different stages and UI, this study aimed to evaluate their relationship.

Method: This study included 99 women with UI, divided into three groups: those with UUI, SUI, and MUI. Demographic information was collected, and clinical assessments included the UDI-6 questionnaire, cough stress test and POP staging using the POP-Q system performed. Statistical analyses were applied to examine correlations by using SPSS version 26. This study analyzed the relationship between UI and POP stage, along with factors such as age, Body Mass Index (BMI), number of pregnancies, delivery history, delivery method, menopausal age.

Results: No statistically association was found between type of urinary incontinence and pelvic organ prolapse stage ($p<0.05$). Also no statistical associations were observed between incontinence type and age, number of deliveries, number of pregnancies, delivery method, BMI, and age at menopause. However, menopausal status was significantly associated with UI type ($p=0.009$). Subgroup analysis revealed that in women under 50 years and nonmenopausal women, posterior compartment prolapse was significantly correlated with UI type, especially UUI and MUI ($p<0.016$). Logistic regression analysis did not identify any independent predictors.

Conclusion: Overall, POP stage was not associated with UI type. Nonetheless, posterior prolapse was significantly related to UI in younger and nonmenopausal women, highlighting the importance of subgroup-specific evaluation and the need for larger-scale studies

Keywords: Mixed urinary incontinence, Pelvic organ prolapse, Stress urinary incontinence, Urgency urinary incontinence

Introduction

The descent of one or more of the anterior or posterior vaginal walls, the uterus (cervix), or the apex of the vagina (vaginal vault or cuff scar following hysterectomy) is known as Pelvic Organ Prolapse (POP) (1). This condition results from weakened pelvic support structures or neuromuscular dysfunction (2). Over 20% of women with POP require reconstructive surgery at least once in their lifetime, with 30% undergoing repeat surgeries (3). Prolapse is often accompanied by symptoms such as urinary incontinence, urinary obstruction, urgency, frequency, and, in severe cases, urinary retention and kidney disorders. Other symptoms include pelvic pain, defecation dysfunction, and dyspareunia (4). Urinary incontinence can have serious mental and social impacts, such as anxiety, truthfulness, depression, embarrassment, and reduced self-esteem. Social isolation, avoiding social gatherings, decreased mobility, increased dependence, and a decline in interpersonal connections are constantly the results of a combination of these feelings (5). Additionally, it imposes financial burdens on healthcare systems, increasing nursing home admissions. The prevalence of urinary incontinence among women varies between 5 and 70%, depending on the study (6). Urinary incontinence is divided into different orders. Stress Urinary Incontinence (SUI) is characterized by involuntary leakage of urine during conditions similar as coughing, sneezing, moving, or abdominal straining. Urgent Urinary Incontinence (UUI) involves involuntary urine loss that occurs with an immediate feeling of urgency. Mixed Urinary Incontinence (MUI) refers to any combination of these two types (7). Treatment options range from conservative management, such as observation and vaginal pessaries, to surgical intervention, depending on the severity of symptoms (8).

Several studies have reported a high co-occurrence of POP in patients with SUI (9). Furthermore, patients with MUI have been found to experience more severe stages of prolapse compared to those with either stress or urgency incontinence alone (10). However, other studies have shown only a weak to moderate correlation between the stage of prolapse and lower urinary tract symptoms, suggesting that these symptoms may not be independently associated with POP (11-13).

This study is designed to evaluate whether different stages of POP could have impact on urinary incontinence.

Materials and Methods

The study was approved by the Research Ethics Committee of Mashhad Medical Science, Islamic Azad University (IR.IAU.MSHD.REC.1400.009). The required sample size was estimated based on a previous study by Cameron *et al* (10), which reported mean (±SD) scores of the Pelvic Organ Prolapse Distress Inventory (POPDI) as 20.6±22.4 in the MUI group and 10.7±14.7 in the UUI group. Using these parameters, and assuming a 90% confidence level (Z=1.64) and 80% statistical power (Z=0.84), the following formula was applied:

$$n = \frac{(Z_1 - \alpha/2 + Z_1 - \beta)^2 * (\sigma_1^2 + \sigma_2^2)}{(\bar{X}_1 - \bar{X}_2)^2}$$

$n = (1.64+0.80)^2 (22.42+14.72) / (20.6-10.7)^2 = 44$

Due to logistical challenges during the COVID-19 pandemic, including restricted access to clinical settings and limited patient availability, the actual sample size was reduced to 33 participants per group. Participants met the following inclusion criteria: 1) Married women between age 20 to 70 years who referred to pelvic floor disorders clinic. Exclusion Criteria including: 1) Prior surgery for prolapse or urinary incontinence, 2) current use of psychiatric medications, 3) Urinary or intestinal fistulas, 4) Neurological conditions affecting continence (*e.g.*, Parkinson's disease, multiple sclerosis, Alzheimer's disease), 5) Medications exacerbating incontinence (*e.g.*, diuretics). All participants were informed about the study's purpose, assured of confidentiality, and provided written informed consent.

Assessment tools

Urinary incontinence was evaluated using the UDI-6 questionnaire and Cough Stress Test (CST). Cough stress test: Due to the lack of standardized CST guidelines for women with POP, a practical protocol was proposed for use in Urogynaecological settings. The test was performed with a full bladder, and participants were instructed to cough up to five times in five specific scenarios. The first two CSTs were

done without prolapse reduction—first in a standing position, then in semi-lithotomy. The next two tests were performed in the same position with prolapse reduced, using a posterior speculum and a ring pessary, respectively. The final CST was repeated in the standing position with the pessary in place. After testing, total bladder volume was estimated by combining voided volume and postvoid residual measured *via* catheterization. A CST was considered positive if urine leakage occurred simultaneously with coughing in any of the five scenarios (14).

UDI-6 questionnaire: Assessed urinary incontinence type, frequency, incontinence severity, and triggers such as increased abdominal pressure or urgency. POP was assessed using the POP-Q system with patients in the lithotomy position during the Valsalva maneuver. Prolapse stages were classified as follows: Stage 0: No prolapse, Stage 1: Prolapsed organ remains >1 *cm* above the hymen, Stage 2: Prolapse extends ≤1 *cm* above or below the hymen, Stage 3: Prolapse extends >1 *cm* below the hymen but remains <2 *cm* short of total vaginal length, Stage 4: Complete prolapse beyond vaginal length.

Data analysis

Data were analyzed using SPSS version 26 (IBM Corp., Armonk, NY, USA). The normal distribution of quantitative data was examined using the Shapiro-Wilk test. Normally distributed data are presented with mean and standard deviation, and non-normally distributed data are presented with median and Interquartile Range (IQR). Two independent samples t-test was used for comparing means of normally distributed data between two groups. Non-parametric tests like Kruskal-Wallis (for non-normally distributed data). Nominal data were analyzed by Chi-square test (Fisher's exact test applied when expected frequencies were low) and significance threshold: $p<0.05$.

Results

This study, conducted in 2021, included 99 women with urinary incontinence referred to a pelvic floor disorders clinic. Participants were categorized into three groups: SUI (n=33), UUI (n=33), and MUI (n=33). Demographics mean age: 52.7±11.91 years (40 women were under 50; 59 were 50 or older), Mean Body Mass Index (BMI): 29.95±5.08 kg/m^2 (82 participants were overweight or obese), Pregnancies: 73 participants (73.7%) had ≥2 pregnancies, Deliveries: 62 participants (62.6%) had ≥2 deliveries, Menopausal status: 60.6% were postmenopausal and 58.3% experienced menopause before age 50, Prolapse Distribution: Most participants had stage 0 apical pelvic prolapse, Stage 3 apical prolapse was the least common (Table 1). 69.7% of those with UUI had apical pelvic prolapse (Tables 2 and 3). As shown in table 4, no statistical associations were observed between incontinence type and age (p=0.054), number of deliveries (p=0.230), number of pregnancies (0.325), delivery method (p=1), BMI (0.788), age at menopause(p=0.449).

A statistically significant relationship was observed between menopausal status and type of incontinence (p=0.009). Further analysis of the subgroups of patients' menopausal status revealed a statistically significant relationship between the severity of posterior compartment prolapse and the type of incontinence in the non-menopausal patients. Thus,

Table 1. Distribution of different types of pelvic prolapse stages in the study population

Prolapse stage	Types of pelvic prolapse	Number (%)
Stage 0	Anterior	5(5.1%)
	Posterior	10(10.1%)
	Apical	67(67.7%)
Stage 1	Anterior	40(40.4%)
	Posterior	50(50.5%)
	Apical	17(17.2%)
Stage 2	Anterior	40(40.4%)
	Posterior	32(32.3%)
	Apical	10(10.1%)
Stage 3	Anterior	10(10.1%)
	Posterior	3(3%)
	Apical	1(1%)
Stage 4	Anterior	4(4%)
	Posterior	4(4%)
	Apical	4(4%)
Total	Anterior	99(100%)
	Posterior	99(100%)
	Apical	99(100%)

Table 2. Frequency distribution of stages of different types of Pelvic Organ Prolapse (POP) based on the type of Urinary Incontinence (UI) in the studied population (Fisher–Freeman–Halton test)

Types of pelvic prolapse	Prolapse Stage	MUI N(P)	UUI N(P)	SUI N(P)	p-value
Anterior	0	2(1/6)	2(1/6)	1(3)	0.056
	1	12(4/36)	15(5/45)	13(4/39)	
	2	18(5/54)	8(2/24)	14(4/42)	
	3	1(3)	4(1/12)	5(2/15)	
	4	0(0)	4(1/12)	0(0)	
Posterior	0	4(1/12)	5(2/15)	1(3)	0.004
	1	11(3/33)	20(6/60)	19(6/57)	
	2	16(5/48)	4(1/12)	12(4/36)	
	3	2(1/6)	0(0)	1(3)	
	4	0(0)	4(1/12)	0(0)	
Apical	0	22(7/66)	23(7/69)	22(7/66)	0.03
	1	9(3/27)	2(1/6)	6(2/18)	
	2	1(3)	4(1/12)	5(2/15)	
	3	1(3)	0(0)	0(0)	
	4	0(0)	4(1/12)	0(0)	

Urgency Urinary Incontinence (UUI), Stress Urinary Incontinence (SUI), Mixed Urinary Incontinence (MUI).

Table 3. Correlation between the type of Urinary Incontinence (UI) and the stage of Pelvic Organ Prolapse (POP) in the studied population

Type of POP	Type of UI	Number	Least stage	Greatest stage	Mean±SD	CI (95%)	Median	IQR	p-value
Anterior	SUI	33	0	3	1.70±0.770	1.70±0.274→(1.43, 1.97)	2.00	1	0.847
	UUI	33	0	4	1.79±1.139	1.79±0.405→(1.39, 2.20)	1.00	2	
	MUI	33	0	3	1.55±0.666	1.55±0.237→(1.31, 1.79)	2.00	1	
	Total	99	0	4	1.68±0.879	-	-	-	
Posterior	SUI	33	0	3	1.39±0.609	1.39±0.217→(1.17, 1.61)	1.00	1	0.176
	UUI	33	0	4	1.33±1.131	1.33±0.403→(0.93, 1.73)	1.00	1	
	MUI	33	0	3	1.48±0.795	1.48±0.282→(1.20, 1.76)	2.00	1	
	Total	99	0	4	1.40±0.868	-	-	-	
Apex	SUI	33	0	2	0.48±0.755	0.48±0.268→(0.21, 0.75)	0.00	1	0.944
	UUI	33	0	4	0.79±1.368	0.79±0.486→(0.30, 1.28)	0.00	2	
	MUI	33	0	3	0.42±0.708	0.42±0.252→(0.17, 0.67)	0.00	1	
	Total	99	0	4	0.57±1.002	-	-	-	

Urgency Urinary Incontinence (UUI), Stress Urinary Incontinence (SUI), and Mixed Urinary Incontinence (MUI).

Table 4. Comparison of demographic characteristic between types of UI

Variable	SUI (n=33)	UUI (n=33)	MUI (n=33)	p-value
Age (years, mean±SD)	50.88±10.61	56.76±11.86	50.45±12.49	0.054
Number of pregnancies (mean±SD*)	3.70±2.20	4.52±2.41	4.21±2.06	0.325
Number of deliveries (mean±SD)	3.24±1.86	4.09±2.05	3.79±2.15	0.230
BMI (*kg/m²*, mean±SD)	30.52±4.76	29.53±4.06	29.80±8.28	0.788
Menopause age (years, mean±SD)	49.06±4.16 (n=17)	49.52±5.77 (n=27)	51.19±4.75 (n=16)	0.449
Menopausal status (n, %)	No: 16(48.5%) Yes: 17(51.5%)	No: 6(18.2%) Yes: 27(81.8%)	No: 17 (51.5%) Yes: 16 (48.5%)	0.009
Type of delivery (n, %)	NVD**: 26(78.8%) CS***: 2(6.1%) Both: 5(15.2%)	NVD: 27(81.8%) CS: 1(3%) Both: 5(15.2%)	NVD: 27(81.8%) CS: 1(3%) Both: 5(15.2%)	1

Urgency Urinary Incontinence (UUI), Stress Urinary Incontinence (SUI), and Mixed Urinary Incontinence (MUI),*SD: Standard Deviation, **NVD: Natural Vaginal Delivery, ***CS: Cesarian Section.

using adjusted Bonferroni post-hoc test, a statistically significant relationship was observed between the two types of MUI and UUI with the severity of prolapse ($p<0.016$). Also, in the subgroup analysis of demographic findings, a statistically significant relationship was observed in patients under 50 years of age between type of incontinence and severity of prolapse in the posterior compartment ($p=0.013$). Similarly, using adjusted Bonferroni post-hoc test, a statistically significant relationship was observed between the two types of MUI and UUI with the severity of prolapse ($p<0.01$). However, in the multinomial logistic regression analysis performed to examine the independent effect of all variables simultaneously to adjust for confounding variables, none of the variables, including the degree of posterior prolapse, age, BMI, type of delivery, number of pregnancies, number of deliveries, and menopausal status, had a statistically significant relationship with the type of urinary incontinence (Table 5).

Table 5. Multinomial regression analysis of independent predictors of urinary incontinence types (adjusted for covariates) *

Group	Variable	B	Std. Error	Wald	df	p-value	OR	95%CI for Exp(B)
SUI	Intercept	0.213	2.599	0.007	1	0.935	-	-
	Age	0.010	0.039	0.072	1	0.789	1.011	0.936-1.091
	Pregnancy (No.)	0.129	0.326	0.156	1	0.693	1.137	0.600-2.156
	Delivery (No.)	-0.381	0.372	1.047	1	0.306	0.683	0.330-1.417
	Posterior prolapse-stage	-0.138	0.325	0.180	1	0.672	0.871	0.461-1.648
	BMI	0.026	0.045	0.332	1	0.565	1.026	0.939-1.122
	Delivery=1	-0.361	0.768	0.221	1	0.638	0.697	0.155-3.141
	Delivery=2	-0.159	1.518	0.011	1	0.917	0.853	0.044-16.731
	Delivery=3	0b	-	-	0	-	-	-
	Menopause=1	-0.413	0.906	0.208	1	0.648	0.661	0.112-3.903
	Menopause=2	0b	-	-	0	-	-	-

Contd. table 5.

	Intercept	1.966	2.799	0.493	1	0.483	-	-
	Age	0.008	0.041	0.037	1	0.847	1.008	0.930-1.093
	Pregnancy (No.)	0.050	0.334	0.022	1	0.882	1.051	0.546-2.022
	Delivery (No.)	-0.177	0.370	0.231	1	0.631	0.837	0.406-1.728
	Posterior prolapse stage	-0.204	0.317	0.413	1	0.520	0.816	0.439-1.518
UUI	BMI	-0.022	0.051	0.179	1	0.672	0.978	0.885-1.082
	Delivery=1	-0.475	0.803	0.350	1	0.554	0.622	0.129-3.003
	Delivery=2	-0.195	1.768	0.012	1	0.912	0.823	0.026-26.296
	Delivery=3	0b	-	-	0	-	-	-
	Menopause=1	-1.728	0.976	3.134	1	0.077	0.178	0.026-1.203
	Menopause=2	0b	-	-	0	-	-	-

Urgency Urinary Incontinence (UUI), Stress Urinary Incontinence (SUI), and Mixed Urinary Incontinence (MUI), Body Mass Index (BMI). * Reference category: MUI.

Discussion

This study investigated the correlation between urinary incontinence and demographic factors but found no significant relationship between the urinary incontinence and the type of prolapse.

In a similar study by Bai *et al*, the relationship between the location and severity of prolapse, SUI, and urinary excretion symptoms was assessed. This study featured a larger sample size and examined urinary symptoms in three different groups of patients with prolapse (anterior, posterior, and apex) (9). Consistent with present study findings, no significant correlation was observed between SUI and prolapse severity.

Daneshpajooh *et al* evaluated a larger cohort of patients and classified those with urinary symptoms into three categories according to the type of urinary incontinence: SUI, UUI, and MUI (10). The primary difference between their study and the present study was the complete categorization of patients based on the type of prolapse (anterior, posterior, apex) and the separate examination of the relationship between each type of prolapse and urinary incontinence. Similarly, no significant correlation was found between prolapse severity and the incontinence. The present study findings align with those of previous studies.

A study conducted by Liedl *et al* in 2024 revealed a significant relationship between urinary incontinence and POP; however, no correlation was found between urinary incontinence and the stage of POP. It was suggested that the prevalence of urinary incontinence symptoms in women with stage II pelvic prolapse is not significantly different from that in stages III and IV (11). These results are consistent with the present study. The key difference between this study and this study is that they did not categorize urinary incontinence types or examine them separately across different stages of pelvic prolapse.

A study by Espuña-Pons M *et al*, in 2020 involved 145 patients with stage IV pelvic prolapse. The study found that more than 50% of these patients had SUI, yet 40% were asymptomatic (12). This study differs from this study in its analysis of the relationship between the severity of pelvic prolapse and the urinary incontinence. Factors such as internal sphincter defects and urodynamic tests, along with a larger sample size, may account for this difference. Nevertheless, more extensive research in this field could yield more comprehensive insights.

A study that published by Kinman and colleagues showed a quadratic relationship between age and symptom bother: women in their 60s and 70s reported the highest distress, while younger and older women were less bothered, regardless of prolapse stage. This study considers the weakness of the abdominal wall muscles and reasons based on increasing age to

justify this significant relationship in relation to the occurrence of pelvic prolapse in women in their sixties and seventies. The study conducted, like this study, confirms the existence of a significant relationship between the occurrence of prolapse and changes in the age of the patients, but confirms this relationship in older ages, unlike the current study, which examined patients and confirmed the existence of a significant relationship between prolapse in women under fifty years of age. The statistical comparison obtained from this study shows that a study with a larger sample size and an examination of associated medical risk factors in patients, as well as anatomic differentiation of the location of pelvic prolapse in patients of different ages, can give more credibility to these findings (15).

A large study conducted in 2015 by Vergeldt *et al* (16), have indicated that age plays a complex role in POP. While older age increases the risk of developing POP due to tissue weakening, younger women with POP may face higher recurrence risk, possibly from hereditary or connective tissue factors. Studies show inconsistent findings, suggesting a non-linear, where both younger and older ages are associated with higher POP risk compared to middle age. These findings confirm present study finding that POP can be age-related and verify its association with age-related changes in both cases under 50 years and over 50 years. This highlights the need for further research on age-related mechanisms in POP.

Another study conducted in 2021 by Brito *et al* on related articles examined the relationship between menopause and POP. Estrogen deficiency during menopause weakens pelvic support structures by reducing collagen and tissue elasticity, increasing the risk of POP. Evidence links postmenopausal status to POP. Overall, menopause likely contributes to POP development, but more research is needed to clarify its role. Like the present study, it confirms the existence of an association between POP and menopause, but, unlike present study findings, considers menopause to be concomitant. This finding indicates that to make the data and its results more transparent and accurate, a specific and focused study is needed on menopausal and non-menopausal women with uterine organ prolapse (17).

This study faced some limitations. The COVID-19 pandemic restricted access to patients, limiting our sample size and possibly affecting the results' strength. Also, a larger patient group would help improve the reliability of findings. Additionally, limited demographic data on posterior compartment prolapse restricted deeper analysis of its link with urinary incontinence. Future research with more patients and comprehensive data is recommended.

Conclusion

No overall significant association was found between urinary incontinence and POP severity or common risk factors including age, delivery history, parity, menopausal status, BMI, age at menopause, and delivery method ($p>0.05$). However, in women under 50 years ($p=0.013$) and nonmenopausal women ($p=0.026$), posterior compartment prolapse was significantly linked to urinary incontinence, indicating a subgroup-specific relationship.

Ethical approval

The study was approved by the Research Ethics Committee with ID (IR.IAU.MSHD.REC.1400.009).

Funding

This study did not have any funding recourses.

Consent to Participate

Written informed consent was obtained from all participants.

Acknowledgement

We sincerely thank the kind contributions of all patients participating in this study, the experts of Research Centre of Mashhad Medical Sciences Islamic Azad University and all those who helped us complete this research.

Conflict of Interest

Authors declare no conflict of interest.

References

1. Mudalige T, Pathiraja V, Delanerolle G, Cavalini H, Wu S, Taylor J, et al. Systematic review and meta-analysis of the pelvic organ prolapse and vaginal prolapse among the global population. BJUI Compass 2025;6(1):e464.

2. DeLancey JO. What's new in the functional anatomy of pelvic organ prolapse? Curr Opin Obstet Gynecol 2016;28(5):420-9.

3. Alas AN, Chinthakanan O, Espaillat L, Plowright L, Davila GW, Aguilar VC. De novo stress urinary incontinence after pelvic organ prolapse surgery in women without occult incontinence. Int Urogynecol J 2017;28:583-90.

4. Yuk JS, Lee JH, Hur JY, Shin JH. The prevalence and treatment pattern of clinically diagnosed pelvic organ prolapse: a Korean National Health Insurance Database-based cross-sectional study 2009-2015. Sci Rep 2018;8(1):1334.

5. Elsayed Mohammed R, Mahmoud Zaki M, Ahmed Mostafa H. Impact of urinary incontinence on psychological well-being and quality of life among elderly people. Egyptian Journal of Health Care 2021;12(1):1046-62.

6. Duralde ER, Rowen TS. Urinary incontinence and associated female sexual dysfunction. Sex Med Rev 2017;5(4):470-85.

7. Kasyan G, Grigoryan B, Pushkar D. A novel clinical classification for male urinary incontinence: MI-CRONS. Continence Reports 2024;10:100051.

8. Aboseif C, Liu P. Pelvic organ prolapse. 2020.

9. Bai S, Jeon M, Kim J, Chung K, Kim S, Park K. Relationship between stress urinary incontinence and pelvic organ prolapse. Int Urogynecol J Pelvic Floor Dysfunct 2002;13:256-60.

10. Cameron AP, Smith AR, Lai HH, Bradley CS, Liu AB, Merion RM, et al. Bowel function, sexual function, and symptoms of pelvic organ prolapse in women with and without urinary incontinence. Neurourol Urodyn 2018;37(8):2586-96.

11. Liedl B, Barba M, Wenk M. Rekonstruktive Beckenbodenchirurgie – Update 2024: prolapsassoziierte Symptome und deren Heilung [Pelvic floor reconstruction-update 2024: prolapse-associated symptoms and their treatment]. Urologie 2024 Jan;63(1):43-50. German.

12. Espuña-Pons M, Fillol M, Pascual MA, Rebollo P, Mora AM, Group FPFDR. Pelvic floor symptoms and severity of pelvic organ prolapse in women seeking care for pelvic floor problems. Eur J Obstet Gynecol Reprod Biol 2014;177:141-5.

13. Chen A, McIntyre B, De EJ. Management of postoperative lower urinary tract symptoms (LUTS) after pelvic organ prolapse (POP) repair. Curr Urol Rep 2018;19:1-8.

14. Espuña-Pons M, Diez-Itza I, Anglès-Acedo S, Covernton PJ, group G. Cough stress tests to diagnose stress urinary incontinence in women with pelvic organ prolapse with indication for surgical treatment. Neurourol Urodyn 2020;39(2):819-25.

15. Kinman CL, Lemieux CA, Agrawal A, Gaskins JT, Meriwether KV, Francis SL. The relationship between age and pelvic organ prolapse bother. Int Urogynecol J 2017;28:751-5.

16. Vergeldt TF, Weemhoff M, IntHout J, Kluivers KB. Risk factors for pelvic organ prolapse and its recurrence: a systematic review. Int Urogynecol J 2015;26:1559-73.

17. Brito LGO, Pereira GMV, Moalli P, Shynlova O, Manonai J, Weintraub AY, et al. Age and/or postmenopausal status as risk factors for pelvic organ prolapse development: systematic review with meta-analysis. Int Urogynecol J 2022:1-15.