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NDM



# TIBBIYOTDA YANGI KUN

Ilmiy referativ, marifiy-ma'naviy jurnal



AVICENNA-MED.UZ



ISSN 2181-712X.  
EISSN 2181-2187

9 (83) 2025

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Журнал был включен в список журнальных  
изданий, рецензируемых Высшей  
Аттестационной Комиссией  
Республики Узбекистан  
(Протокол № 201/03 от 30.12.2013 г.)

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**10 (84)**

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**2025  
октябрь**

Received: 20.09.2025, Accepted: 06.10.2025, Published: 10.10.2025

UDC 618.15-007.44:616-089:616-036.22

## A SYSTEMATIC APPROACH TO RISK FACTOR IDENTIFICATION IN PELVIC ORGAN PROLAPSE USING THE POP-Q CLASSIFICATION

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✓ *Resume*

*Pelvic organ prolapse (POP) is a relevant clinical condition that requires a comprehensive approach to diagnosis and risk factor assessment. This study explores a systematic method for identifying predisposing factors of POP using the standardized Pelvic Organ Prolapse Quantification (POP-Q) system. The analysis includes demographic, anatomical, and functional parameters that help objectify the clinical picture and improve risk stratification accuracy. The use of POP-Q contributes to the unification of diagnostic criteria, enhances interdisciplinary communication, and supports the development of personalized patient management strategies. The findings may serve as a foundation for predictive modeling and optimization of surgical decision-making in pelvic reconstructive surgery.*

**Keywords:** POP-Q; risk factors; quality of life; pelvic organ prolapse; BMI.

## СИСТЕМНЫЙ ПОДХОД К ИДЕНТИФИКАЦИИ ФАКТОРОВ РИСКА ПРИ ПРОЛАПСЕ ТАЗОВЫХ ОРГАНОВ С ИСПОЛЬЗОВАНИЕМ КЛАССИФИКАЦИИ POP-Q

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✓ *Резюме*

*Пролапс тазовых органов (ПТО) представляет собой актуальную клиническую проблему, требующую комплексного подхода к диагностике и оценке факторов риска. В данной работе рассматривается системный метод идентификации предрасполагающих факторов ПТО с использованием стандартизированной классификации POP-Q (Pelvic Organ Prolapse Quantification). Анализ включает демографические, анатомические и функциональные параметры, позволяющие объективизировать клиническую картину и повысить точность стратификации риска. Применение POP-Q способствует унификации диагностических критерий, улучшению междисциплинарной коммуникации и формированию персонализированных стратегий ведения пациенток. Полученные данные могут служить основой для разработки прогностических моделей и оптимизации хирургических решений в области реконструктивной тазовой хирургии.*

**Ключевые слова:** POP-Q; факторы риска; качество жизни; пролапс тазовых органов; ИМТ.

## POP-Q TASNIFIDAN FOYDALANGAN HOLDA TOS A'ZOLARINING PROLAPSI XAVF OMILLARINI ANIQLASHGA TIZIMLI YONDASHUVI

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## ✓ Rezyume

*Tos a'zolarining prolapsi (TAP) — bu tashxis qo'yish va xavf omillarini baholashda kompleks yondashuvni talab qiladigan dolzarb klinik holatdir. Ushbu tadqiqotda TAPga moyillikni aniqlash uchun POP-Q (Pelvic Organ Prolapse Quantification) standartlashtirilgan tasnifidan foydalangan holda tizimli metod tahlil qilinadi. Tahlil demografik, anatomik va funksional parametrlarni o'z ichiga oladi, bu esa klinik manzarani obyekтивlashtirish hamda xavf darajasini aniqroq belgilash imkonini beradi. POP-Qdan foydalanish diagnostika mezonlarini unifikasiyalash, fanlararo hamkorlikni kuchaytirish va bemorlarni individual boshqarish strategiyalarini ishlab chiqishga xizmat qiladi. Olingan natijalar rekonstruktiv tos jarrohligi sohasida prognozlash modellari va jarrohlik qarorlarini optimallashtirish uchun asos bo'lishi mumkin.*

*Kalit so'zlar: POP-Q; xavf omillari; hayot sifati; pelvik a'zolar prolapsi; TVI.*

## Introduction

Pelvic organ prolapse (POP) is a prevalent condition affecting millions of women worldwide, particularly in the postmenopausal period. It is characterized by the descent of pelvic organs—such as the uterus, bladder, or rectum—into or beyond the vaginal canal as a result of weakening of the pelvic floor support structures. According to the International Urogynecology Journal, up to 40% of women may present with stage II prolapse even in the absence of pronounced clinical symptoms [1]. Despite its high prevalence, POP often remains underdiagnosed and underestimated, largely due to social stigma and the lack of standardized assessment methods.

The etiology of POP is multifactorial. International studies have identified key risk factors, including vaginal childbirth, age-related changes, obesity, chronic increases in intra-abdominal pressure, and hereditary connective tissue disorders [1,2]. Vaginal delivery—particularly when accompanied by perineal trauma or the birth of a macrosomic infant—significantly increases the likelihood of pelvic floor dysfunction. Furthermore, hormonal changes during menopause contribute to reduced tissue elasticity and muscle tone, thereby exacerbating the risk of prolapse development.

In response to the need for a standardized and reproducible system for assessing pelvic organ prolapse (POP), the Pelvic Organ Prolapse Quantification (POP-Q) classification was developed in 1996 and endorsed by the International Continence Society (ICS), the American Urogynecologic Society (AUGS), and the Society of Gynecologic Surgeons. The POP-Q system is an objective method based on precise anatomical measurements relative to the hymenal ring [3]. Unlike previously used subjective grading scales, POP-Q ensures consistency in clinical documentation and scientific research.

The clinical significance of POP-Q has been confirmed by numerous international publications. For example, Barber et al. (2024) emphasize that although the anatomical stage of prolapse is important, patient-reported symptoms—particularly the sensation of a vaginal bulge—are more reliable predictors of quality-of-life impairment than objective findings [1]. The discrepancy between anatomical severity and symptom burden underscores the need for a comprehensive approach that integrates both objective and subjective criteria in clinical practice.

Given the multifaceted nature of pelvic organ prolapse (POP) and its impact on the physical, psycho-emotional, and sexual health of women, there is a clear need for comprehensive studies aimed at identifying risk factors and applying standardized assessment methods. The present study focuses on examining the spectrum of predisposing factors for the development of POP and evaluating the degree of prolapse using the POP-Q (Pelvic Organ Prolapse Quantification) classification in a cohort of 130 patients. The findings are expected to contribute to the international evidence base, supporting a personalized and evidence-based approach to the management of women with pelvic organ prolapse.

**Objective:** The aim of this article is to conduct a comprehensive analysis of the risk factors contributing to the development of pelvic organ prolapse in women, based on prospective observational data, and to provide an objective assessment of prolapse severity using the standardized POP-Q classification.

## Materials and Methods

This prospective study was conducted in the Department of Operative Gynecology at the Republican Specialized Scientific and Practical Medical Center for Maternal and Child Health (RSSPMCMCH) from 2022 to 2024. The study included 130 women aged 35 to 75 years (mean age –  $49.82 \pm 8.97$  years)

who presented with complaints characteristic of pelvic organ prolapse (POP), such as a sensation of a foreign body in the vagina, discomfort while walking, and urinary or defecatory dysfunction. All participants provided informed consent to take part in the study, in accordance with the principles of the Declaration of Helsinki.

Inclusion criteria:

- Presence of clinical signs of pelvic organ prolapse;
- Absence of malignant neoplasms of the pelvic organs;
- No history of previous reconstructive pelvic floor surgery.

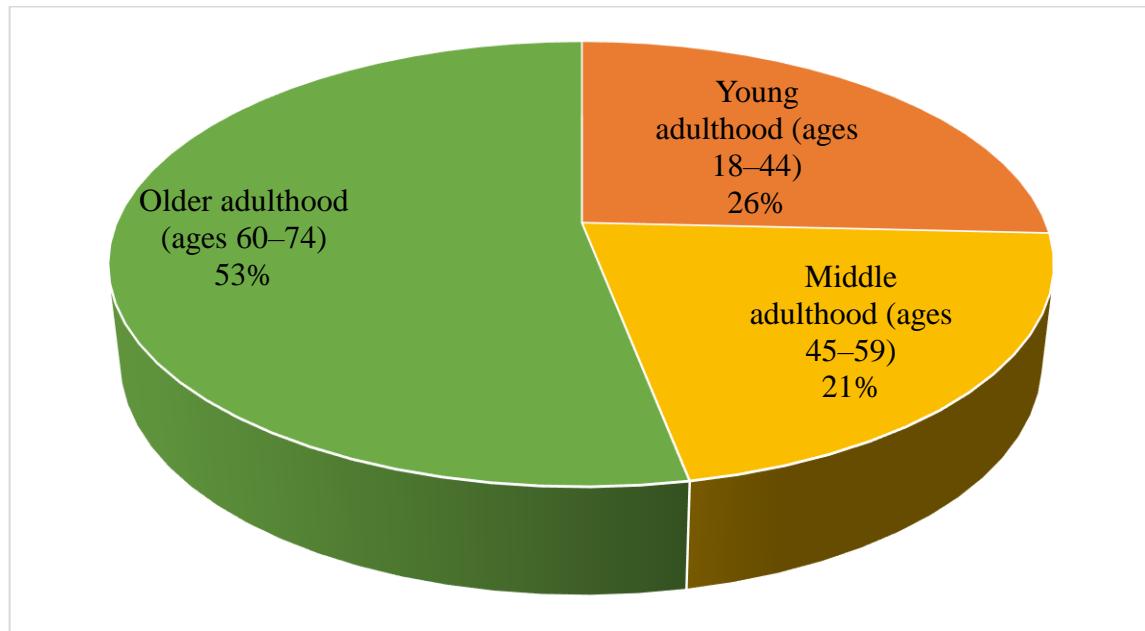
Exclusion criteria:

- Severe neurological disorders;
- Active inflammatory processes;
- Refusal to participate in the study.

Each patient underwent a standard gynecological examination using the Pelvic Organ Prolapse Quantification (POP-Q) system, as recommended by the International Continence Society (ICS) and the American Urogynecologic Society (AUGS). The degree of prolapse was assessed in the standing position during the Valsalva maneuver, with documentation of six anatomical reference points: Aa, Ba, C, D, Ap, and Bp, as well as measurements of the genital hiatus length, perineal body length, and total vaginal length. All measurements were recorded in centimeters relative to the hymenal ring, followed by determination of the prolapse stage from 0 to IV.

### Results and Discussion

This section presents the main quantitative and qualitative findings of the study, along with their interpretation in the context of current international data. Particular attention is given to analyzing the degree of pelvic organ prolapse in relation to the combination of risk factors, which is of critical importance for developing personalized approaches to the diagnosis and management of POP.

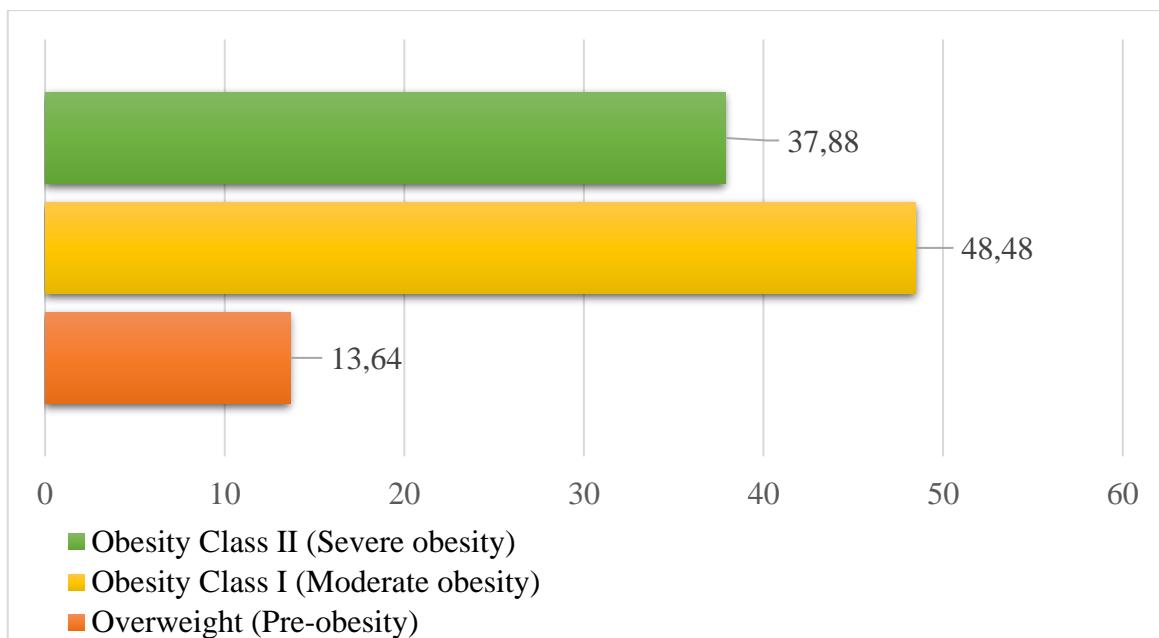


**Fig. 1. Age distribution of the study participants, %**

Height and weight were measured in all patients. In the observation group (OG), height ranged from 148 cm to 176 cm (mean –  $162.17 \pm 7.53$  cm). Body weight varied between 76 kg and 105 kg (mean –  $91.20 \pm 7.76$  kg).

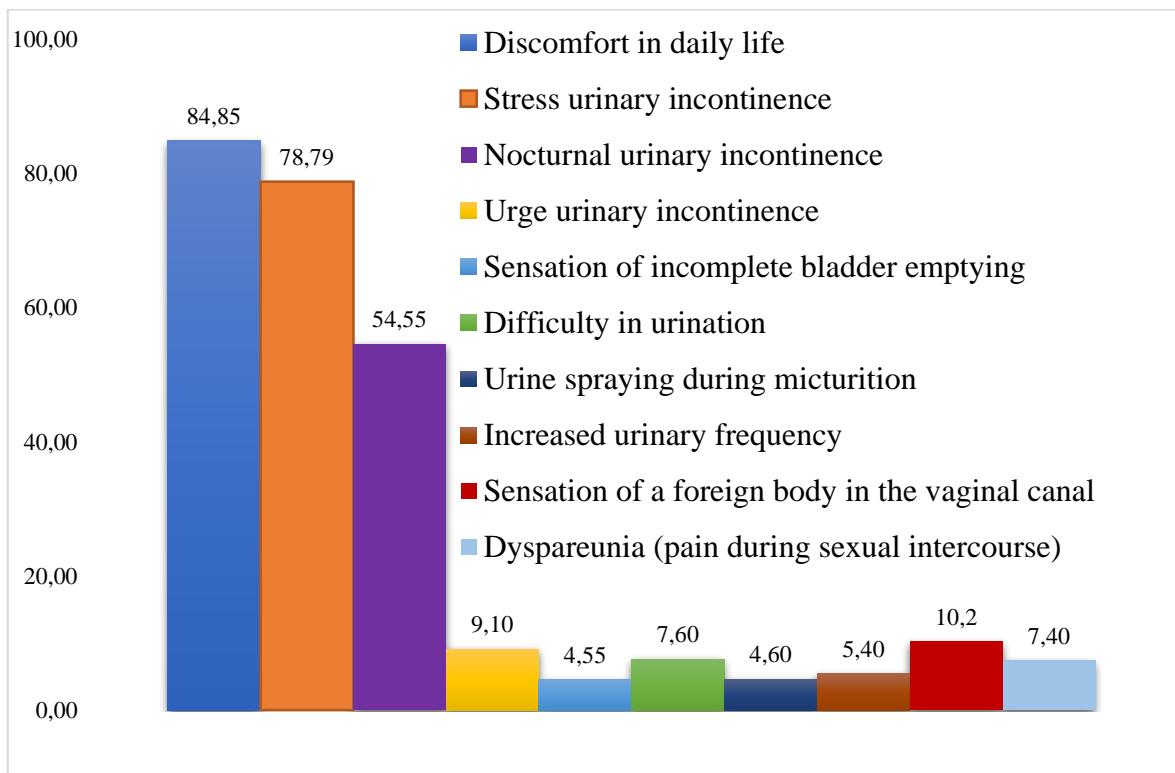
Body mass index (BMI) was calculated for all participants, ranging from  $31.22 \text{ kg/m}^2$  to  $36.31 \text{ kg/m}^2$ , with a mean BMI of  $34.64 \pm 0.89 \text{ kg/m}^2$ , a median (Me) of  $34.78 \text{ kg/m}^2$ , and a mode (Mo) of  $34 \text{ kg/m}^2$ .

According to reference BMI values, 32 patients (48.48%) had class I obesity, 25 patients (37.88%) had class II obesity, and 9 patients (13.64%) were classified as overweight. The mean obesity grade in the OG was  $1.24 \pm 0.68$ . (Fig. 2).



**Fig. 2. Distribution of patients in both groups by BMI, %**

At the time of the initial examination, the primary complaint among women was dyspareunia, reported by 52 patients (78.79%). A sensation of a foreign body in the vagina was noted by 36 women (54.55%). Increased urinary frequency was reported by 9 patients (13.64%), while urine spraying during micturition was described by 6 women (9.09%). Three patients each (4.55%) reported difficulty in urination, a sensation of incomplete bladder emptying, urgency urinary incontinence, nocturnal urinary incontinence, and stress urinary incontinence. Discomfort in daily life was experienced by 56 patients (84.85%) (Fig. 3).



**Fig. 3. Complaints of the study participants, %**

In all women included in the study, the degree of pelvic organ prolapse and the localization of measurement points were determined preoperatively according to the POP-Q (Pelvic Organ Prolapse Quantification) classification. All patients were found to have stage II POP, with a mean stage of  $2.22 \pm 0.42$  (Table 2).

**Table 2. Localization of measurement points according to the POP-Q classification before surgery ( $M \pm SD$ )**

Measurement point (POP-Q)	(n = 130), cm ( $M \pm SD$ )
Aa	$-0.56 \pm 0.25$
Ap	$-0.56 \pm 0.24$
Ba	$0.65 \pm 0.17$
Bp	$0.66 \pm 0.16$
tv1	$9.48 \pm 0.44$
<b>Mean POP stage</b>	<b><math>2.0 \pm 0.0</math></b>

### Conclusions:

1. The retrospective study of 130 female patients with pelvic organ prolapse (POP) demonstrated that the mean age of participants was  $49.82 \pm 8.97$  years, corresponding to the most socially and professionally active period of life, during which POP has a significant impact on quality of life.
2. Anthropometric data indicated a high prevalence of overweight and obesity among the study population: the mean BMI was  $34.64 \pm 0.89$  kg/m<sup>2</sup>, with class I obesity identified in 48.48% of patients, class II obesity in 37.88%, and overweight in 13.64%. These findings confirm the significant role of excess body weight as a risk factor for the development and progression of POP.
3. The most common patient complaints were dyspareunia (78.79%), a sensation of a foreign body in the vagina (54.55%), and discomfort in daily life (84.85%), underscoring the pronounced negative impact of POP on the physical and psycho-emotional well-being of women.
4. POP-Q classification assessment revealed that all patients were diagnosed preoperatively with stage II prolapse, with a mean stage of  $2.22 \pm 0.42$ . This indicates a relatively homogeneous sample in terms of disease severity, enhancing the reliability of comparative risk factor analysis.
5. The findings confirm the multifactorial nature of POP, with key predisposing factors including age, obesity, reproductive history, and chronic conditions associated with increased intra-abdominal pressure.

The results of this study demonstrate that pelvic organ prolapse in middle-aged and older women is a pressing medical and social issue requiring a comprehensive approach to diagnosis and treatment. The high prevalence of obesity among patients highlights the need to incorporate weight management strategies into prevention and rehabilitation programs.

The use of the standardized POP-Q classification ensures objective assessment of prolapse severity, facilitates longitudinal monitoring of patient status, and enables accurate comparison of treatment outcomes in both clinical and research settings.

The data obtained may serve as a basis for developing personalized management strategies for women with POP, aimed at reducing the risk of disease progression and improving quality of life.

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Entered 20.09.2025