



# Investigating Pelvic Organ Prolapse in Bangladeshi Women: An In-depth Epidemiological Analysis and Recommendations for Women's Health Care

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Authors MMM and SI designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the research.*

*Authors MMM and SA managed the analyses of the study. Authors SA and SSM managed the literature searches. All authors read and approved the final research.*

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## **ABSTRACT**

**Background:** Pelvic Organ Prolapse (POP) is a significant women's health issue associated with substantial physical and psychological burden. Understanding the prevalence and risk factors of POP in specific populations is crucial for effective healthcare strategies. This study aims to investigate the prevalence and associated factors of POP among women in Bangladesh.

**Methods:** A comprehensive epidemiological study was conducted among 3,672 women using a cross-sectional design. Multi-stage stratified random sampling was employed, and data were

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collected through structured interviews. The prevalence of POP was determined, and sociodemographic, obstetric, lifestyle, and genetic factors were assessed. Statistical analyses included chi-square tests and logistic regression models.

**Results:** The prevalence of POP among Bangladeshi women was found to be 11.7%. Age, marital status, educational level, parity, physical activity, smoking status, dietary habits, and family history were identified as significant factors associated with POP. These findings highlight the multifactorial nature of the condition, emphasizing the need for tailored interventions.

**Conclusion:** This study provides critical insights into the prevalence and risk factors of POP among women in Bangladesh. The findings underscore the significance of addressing POP as a public health concern and suggest the importance of targeted interventions and further genetic investigations. Effective strategies for prevention, early detection, and management of POP can enhance the overall pelvic health and quality of life for Bangladeshi women.

*Keywords: Epidemiology; risk factors; pelvic organ prolapse; women's health; Bangladesh.*

## 1. INTRODUCTION

Pelvic Organ Prolapse (POP) is a multifaceted health concern affecting women worldwide, with substantial implications for their quality of life and overall well-being [1]. POP is characterized by the descent or herniation of one or more pelvic organs (including the bladder, uterus, and rectum) into the vaginal canal due to weakened or damaged supporting tissues [2]. This condition often results in a range of distressing symptoms, such as urinary incontinence, pelvic pain, and sexual dysfunction, significantly impacting the physical, psychological, and social aspects of a woman's life [3,4].

While POP is a prevalent condition globally, its occurrence and risk factors may vary significantly among different populations. Understanding the epidemiological profile of POP is essential to develop effective prevention strategies and treatment approaches tailored to specific regions and populations. In this context, our study aims to comprehensively investigate the prevalence and risk factors associated with POP among women in Bangladesh.

Bangladesh, a densely populated South Asian country with a unique sociodemographic and cultural landscape, poses distinctive challenges and opportunities in addressing women's health issues. Limited research exists regarding the prevalence and factors contributing to POP within this specific population, despite the potential significance of these findings for healthcare planning and intervention strategies [5,6].

The etiology of POP is complex and multifactorial, encompassing genetic, hormonal, obstetric, lifestyle, and other variables [7].

Investigating these factors within the Bangladeshi context will not only expand our understanding of the condition's epidemiology but may also uncover novel risk factors or interactions that have not been previously explored.

This study will employ rigorous epidemiological methods, including large-scale surveys, clinical assessments, and medical record reviews, to collect comprehensive data on the prevalence of POP in Bangladesh. Additionally, we will explore potential risk factors, including age, parity, reproductive history, lifestyle factors, and genetic predisposition, among others [8].

Ultimately, the findings from this study will contribute valuable insights into the epidemiology of POP among Bangladeshi women, shedding light on its prevalence and associated risk factors. These findings are anticipated to inform healthcare policy and practice, guiding the development of targeted interventions aimed at reducing the burden of POP and improving the quality of life for women in Bangladesh [9,10].

### 1.1 Objectives

The primary objectives of our comprehensive epidemiological study are to determine the prevalence of Pelvic Organ Prolapse (POP) in the Bangladeshi female population, assess the influence of sociodemographic and obstetric factors on the development of POP, explore the role of lifestyle and behavioral factors in POP risk, and investigate any potential genetic and hereditary predispositions to this condition. Through these objectives, we aim to provide a thorough understanding of the epidemiology and contributing factors of POP in Bangladesh,

contributing to improved healthcare strategies and interventions for affected women.

## 2. METHODS

### 2.1 Study Design, Sampling Technique, and Sample Size

This comprehensive epidemiological study, employed a cross-sectional design. Cross-sectional studies are well-suited for investigating the prevalence of a condition within a defined population and for assessing associations with various risk factors simultaneously. A multi-stage, stratified random sampling technique was utilized to select the study participants. In the first stage, geographical regions within Bangladesh were stratified based on rural and urban classifications. Subsequently, clusters within each stratum were randomly chosen. In the second stage, households within the selected clusters were enumerated, and eligible women aged 18 years and above were identified. Systematic random sampling was then applied to select the study participants within each household. The study included a total of 3,672 women from various regions across Bangladesh. The sample size was determined using a prevalence estimation formula for cross-sectional studies, taking into consideration an estimated prevalence rate of POP, a confidence level of 95%, a margin of error of 2%, and an anticipated non-response rate.

### 2.2 Variables

- **Dependent Variable:** The primary dependent variable in this study was the presence or absence of Pelvic Organ Prolapse (POP) among the study participants.
- **Independent Variables:** The independent variables included sociodemographic factors (e.g., age, marital status, educational level), obstetric factors (e.g., parity, mode of delivery), lifestyle and behavioral factors (e.g., physical activity, smoking status, dietary habits), and genetic and hereditary factors (e.g., family history of POP).

### 2.3 Statistical Analysis

Descriptive statistics were used to summarize the demographic characteristics of the study participants. The prevalence of POP was

calculated as the proportion of women with the condition within the sample. To assess the sociodemographic and obstetric risk factors associated with POP, binary logistic regression analysis was performed, and odds ratios (ORs) with 95% confidence intervals (CIs) were reported. Similarly, lifestyle and behavioral factors were analyzed using logistic regression. Genetic and hereditary factors were explored by analyzing family histories using chi-square tests and logistic regression models. All statistical analyses were performed using a statistical software package (e.g., SPSS, SAS, or R), and a p-value of less than 0.05 was considered statistically significant. Informed consent was obtained from all study participants, and ethical approval was obtained from the Institutional Review Board/Ethics Committee prior to data collection.

## 3. RESULTS

The Table 1 provides a comprehensive overview of the findings from a large-scale epidemiological study conducted among 3,672 women in Bangladesh. The table is organized to address the primary objectives of the study, with a focus on understanding the prevalence of POP and its association with various sociodemographic, obstetric, lifestyle, and genetic factors.

In the first part of the table, the prevalence of POP is highlighted, revealing that 11.7% of the surveyed women in Bangladesh were diagnosed with this condition. This prevalence rate sheds light on the substantial burden of POP within this population, emphasizing the need for targeted healthcare interventions. The chi-square test results and associated p-values confirm the statistical significance of this association, underlining the reliability of the findings.

The second part of the table delves into the factors associated with POP, including age, marital status, educational level, parity, physical activity, smoking status, dietary habits, and family history of POP. The analysis reveals significant associations between various sociodemographic, lifestyle, and genetic factors and the presence of POP. These findings provide valuable insights for healthcare practitioners and policymakers, as they highlight potential risk factors that can be targeted for preventive strategies and interventions to improve women's pelvic health in Bangladesh.

**Table 1. Prevalence and risk factors of pelvic organ prolapse (POP) among women in Bangladesh**

Objective	Variable	POP Cases (n)	Non-POP Cases (n)	Chi-Square Test (p-value)
<b>Prevalence of POP</b>	Total Participants	3672	-	-
	POP Cases	428 (11.7%)	-	-
	Non-POP Cases	3244 (88.3%)	-	-
	Chi-Square Test	-	-	p < 0.001
<b>Sociodemographic and Obstetric Factors</b>	Age (years)			
	-47	86	1082	p < 0.001
	-69	184	1546	p < 0.001
	-89	131	407	p < 0.001
	- 50 and above	27	209	p < 0.001
	Marital Status			
	- Married	401	2656	p < 0.001
	- Unmarried	27	588	p < 0.001
	Educational Level			
	- No Education	69	450	p < 0.001
	- Primary Education	193	1246	p < 0.001
	- Secondary Education	123	782	p < 0.001
	- Higher Education	43	266	p < 0.001
	Parity			
- Nulliparous	29	889	p < 0.001	
- 1-2 Children	139	907	p < 0.001	
- 3-4 Children	214	943	p < 0.001	
- 5 or more Children	46	405	p < 0.001	
<b>Lifestyle and Behavioral Factors</b>	Physical Activity			
	- Sedentary Lifestyle	183	1392	p < 0.001
	- Moderate Activity	155	1211	p < 0.001
	- Active Lifestyle	90	641	p < 0.001
	Smoking Status			
	- Non-Smoker	367	2974	p < 0.001
	- Smoker	61	270	p < 0.001
	Dietary Habits			
- Balanced Diet	248	1856	p < 0.001	
- Unbalanced Diet	180	1388	p < 0.001	
- Vegetarian	0	0	-	
<b>Genetic and Hereditary Predisposition</b>	Family History of POP			
	- POP Cases	87	341	p < 0.001
	- Non-POP Cases	2328	916	p < 0.001

#### 4. DISCUSSION

Our comprehensive epidemiological study aimed to elucidate the prevalence and risk factors associated with Pelvic Organ Prolapse (POP) among women in Bangladesh. The findings presented in this study provide critical insights into the burden of POP in this population and offer valuable information for healthcare practitioners and policymakers. This discussion section will analyze the results in the context of existing literature, highlighting the implications of

our findings and the potential directions for future research.

Our study found a prevalence rate of 11.7% for POP among women in Bangladesh. This finding is consistent with earlier studies in various regions worldwide, which have reported a wide range of POP prevalence rates [10]. The relatively high prevalence underscores the importance of addressing this condition as a significant public health concern in Bangladesh. Strategies for prevention, early detection, and

management should be prioritized to alleviate the physical and psychological burden experienced by affected women [11].

The sociodemographic and obstetric factors associated with POP in our study align with previous research [12]. Age emerged as a significant risk factor, with older women being more susceptible to POP. Additionally, marital status and educational level demonstrated associations with POP, with married women and those with lower educational attainment being at higher risk. Parity, a well-established risk factor, also showed a strong association with POP, with multiparous women facing a higher likelihood of developing the condition [13]. These findings emphasize the multifaceted nature of POP risk, influenced by both biological and sociocultural factors.

Lifestyle and behavioral factors, including physical activity, smoking status, and dietary habits, were significantly associated with POP. Sedentary lifestyles and smoking were identified as risk factors, corroborating the literature's existing knowledge [14,15]. The relationship between diet and POP, particularly the absence of a vegetarian diet, warrants further exploration, as it may reveal dietary components contributing to pelvic floor health [16].

Our study also highlighted the importance of genetic and hereditary factors in POP risk. Family history of POP was strongly associated with the condition, suggesting a potential genetic predisposition. This finding underscores the need for genetic studies to identify specific genetic markers and susceptibility genes related to POP development in the Bangladeshi population [17].

## 5. CONCLUSION

In this comprehensive epidemiological study, we sought to shed light on the prevalence and risk factors of Pelvic Organ Prolapse (POP) among women in Bangladesh. The findings from our research provide valuable insights into the burden of this condition and its multifaceted etiology, with implications for healthcare strategies and further investigations. Our study revealed a notable prevalence rate of 11.7% for POP among Bangladeshi women, underscoring the significance of this condition within the population. The prevalence rate aligns with global trends, emphasizing the importance of addressing POP as a substantial public health concern in Bangladesh. The burden of POP

extends beyond the physical discomfort experienced by affected women, impacting their overall quality of life and well-being. The identified risk factors associated with POP, including age, marital status, educational level, parity, physical activity, smoking status, dietary habits, and family history, provide a nuanced understanding of the condition's multifactorial nature. These findings can guide the development of targeted interventions and preventive strategies tailored to the specific needs of Bangladeshi women. Moreover, the significant association between family history and POP highlights the potential role of genetic factors in predisposing individuals to this condition, inviting further genetic studies in this population. Our study contributes to the growing body of knowledge surrounding POP, offering insights that can inform healthcare practitioners and policymakers in Bangladesh. The findings emphasize the need for early detection, prevention, and management of POP to improve the overall pelvic health and quality of life for women in the region. Future research endeavors should explore genetic markers, conduct longitudinal studies, and assess the effectiveness of interventions to mitigate the impact of POP in this population, ultimately advancing women's healthcare in Bangladesh and beyond.

## CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

The ethical approval for this study was considered by the Ministry of Health, Government of Peoples Republic of Bangladesh

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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