

Socio-economic Factors Impact Prevalence of Pelvic Organ Prolapse in Malwa Region, Central India: An Observational Study

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Background: Causes and risk factors for uterine prolapse are complex and deeply embedded in the cultural, economic and social conditions of women. This study aimed to assess the socio-demographic factors among patients with pelvic organ prolapse and risk factors responsible for etiology and their impact on reporting to medical facilities.

Methods: A cross-sectional study was conducted on 150 women visiting the gynecology outpatient. A semi-structured questionnaire was used to obtain socio-demographic data and prolapse-related data through face-to-face interviews. Age, parity, occupation, educational level, income, mode of delivery, place of delivery and resumption of work after delivery were studied.

Results: Prevalence of prolapse was 35.3% amongst all gynecological conditions. The mean age of participants was 45.27(+5) years. Age more than 45 was related to prolapse than age less than 45 (OR 0.463, 95% CI 0.230-0.932, $p = 0.031$). Prolapse was associated with multiparity (OR 0.238, 95% CI 0.114-0.495, $p = 0.000$). Age 18 or more at first delivery had a higher risk of developing prolapse ($p = 0.000$). The majority of women with prolapse were illiterate ($p = 0.028$) and belonged to class IV of socio-economic status ($p = 0.015$).

Conclusion: Women's age more than 45, agriculture laborer, age more than 18 at first delivery, class IV socio-economic status, BMI more than 25, multiparity are significantly associated as risk factors for prolapse. The number of pelvic organ prolapse surgeries increased four times in this setting, with a medical facility free of cost, which was not the case before when the hospital was a paid institution.

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Introduction

Pelvic organ prolapse (POP) is a condition where the vaginal walls and the top of the vagina, known as the vault, drop from their usual position. This is an anatomical change that needs to be addressed by public health professionals.¹ It is a significant issue because it can have a harmful effect on the overall health of adult women, especially in countries with lower income levels.²

Worldwide, around 3.3 to 4.9 million women experience POP, corresponding to an estimated global prevalence of about 9%. In developing countries, the prevalence is rapidly increasing, reaching around 20%. POP often necessitates surgical intervention, making it one of the most common gynecological procedures, with a lifetime risk of 18.7 in older women, as per a Danish study.³

POP can have a major negative effect on a woman's quality of life by affecting her physical, social,

psychological, and sexual health. It can also cause a lot of discomfort and emotional distress, and is often linked to depressive symptoms. It is common in women aged 40 and older, especially in elderly and postmenopausal women, with a prevalence rate ranging from 41 to 50%.²

The prevalence of POP is expected to double in the next 25 years as women's life expectancy rises; many will spend a significant portion of their lives coping with its effects.⁴ This teaching Institute has been operational since the year 2000. As such, the load of prolapse surgeries is higher compared to other gynecological disorders in the same hospital. About 90% of the women have had this disorder for a long time. It is a matter of concern because the disease is reported late. The incapacitation is quite disturbing still; this could have been managed early, as the prolapse management is offered free of cost. The aim of the study is to find the socio-economic background of this disorder in this setting. Economic status of a family

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always has an impact on the treatment of females. This mental drive of family members influences the time of management for this chronic disorder. Building comprehensive health care systems that meet the World Health Organization's goal of providing fair and high-quality care for everyone is very important. Risk factors for POP are closely connected to gender based discrimination. Social norms that lead to shame and stigma often prevent women from accessing healthcare services. We focus on risk factors specially addressing this epidemiological cohort, requiring special attention in gynecological outdoor services. Always keeping in mind the ambiguous clinical presentation of a socio-economically backward woman will be the right approach to rectify this clinical condition.

Material and Methods

This cross-sectional study was carried out on 150 women who visited the outpatient department of a Rural Hospital in Central India between September 2022 and February 2023. The hospital is a tertiary care facility and a medical college that serves the health needs of people living within a 200 km radius of a district city in Central India. It is the first free-of-cost health facility in the region and has attracted patients from eleven different districts. Data was gathered using a questionnaire that recorded the social and demographic details, reproductive history, and findings from pelvic examination of patients diagnosed with pelvic organ prolapse at the hospital's Obstetrics and Gynecology Department during the study period.

After explaining the study's objectives, the questionnaire was given to the patients in their local language to make sure they understood it properly. The patients in this study were either referred from other health centers in the area or came to the obstetrics and gynecology department themselves because they were experiencing symptoms related to pelvic organ prolapse. All women satisfying the inclusion criteria were enrolled for the study and a written informed consent was taken after explaining the study protocol. A detailed general history of each patient was recorded, including age, socio-economic status (assessed using the Kuppuswamy scale) (Figure 1), occupation, educational background, and family history.⁵ Personal history, woman's years of schooling, occupation, husband's years of schooling, marital status, parity, place of delivery, person conducting delivery, resumption of work after delivery, smoking and constipation, and demographic data were recorded. BMI was recorded as per the standard definition. A BMI less

than 25 is not obese and more than 25 is obese⁶. Patient's chief complaint was noted in chronological order, and a detailed general, systemic and pelvic examination was done.

Patients who came with these symptoms and showed a visible descent of any pelvic organ during examination were included in the study. Pelvic organ prolapse was assessed with the patients lying in the dorsal lithotomy position. A Sim's speculum was used to examine the apical, anterior, and posterior vaginal walls, as well as the perineum, both at rest and during the Valsalva maneuver. The type and severity of pelvic organ prolapse were then determined using the pelvic organ prolapse quantification (POP-Q) system. The POP-Q system is a more comprehensive classification with good inter-observer and intra-observer reliability of physical examination findings.

The Modified Kuppuswamy socio-economic class scale was used to assess the socio-economic status of patients.⁶

Patients with non-puerperal uterine inversions and prolapsed fibroid polyps were excluded from the study. Data collected was incorporated into Statistical Package for Social Sciences (SPSS). Statistical analysis was performed, and the relevant data were organized into tables with appropriately labeled columns and rows representing variables such as age, parity, and body mass index.

Kuppuswamy's socio-economic status, occupation, mode of delivery, place of delivery, age at first delivery and early resumption after delivery were the variables. All risk factors were evaluated using bivariate logistic regression and then included in the multivariate model. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee at R D Gardi Medical College, Ujjain, ID No. - ECR/1030/Inst/MP/2018/RR-21 CDSCO. This committee follows "Declaration of Helsinki" guidelines.

Table 1: Modified Kuppuswamy socio-economic scale⁵

	<i>Socio-economic status</i>	<i>Total score</i>
I	Upper	26–29
II	Upper middle	16–25
III	Lower middle	11–15
IV	Upper lower	5–10
V	Lower	<5

Table 2: Risk factors calculated by binary logistic regression after controlling for other factors in 53 study subjects

		<i>Adjusted OR</i>	<i>95% C.I. Lower</i>	<i>Upper</i>	<i>p-value</i>
Age groups	41–45 years	1	Reference		
	>45 years	0.463	0.230	0.932	0.031*
Occupation	Housewife	1	Reference		
	Agriculture	1.829	0.754	4.437	0.182
	Labourer	0.596	0.272	1.305	0.196
Education	Literate	1	Reference		
	Illiterate	0.185	0.041	0.833	0.028*
SES	Class II	1	Reference		
	Class III	0.475	0.086	2.616	0.392
	Class IV	0.418	0.207	0.844	0.015*
Parity	≤ P2	1	Reference		
	P3-P4	0.184	0.020	1.654	0.131
	≥ P5	0.238	0.114	0.495	0.000*
Place of delivery	Institutional	1	Reference		
	Home	0.591	0.244	1.431	0.244
Age at first delivery	< 18 years	1	Reference		
	≥ 18 years	0.068	0.030	0.155	0.000*
BMI	<25	1	Reference		
	>25	0.208	0.082	0.528	0.001*
Route of delivery	Caesarean	1	Reference		
	Vaginal	0.304	0.084	1.095	0.069
Urinary complaint	No	1	Reference		
	Yes	0.893	0.395	2.020	0.786
Bowel complaint	No	1	Reference		
	Yes	0.948	0.462	1.948	0.885
Resumption of work after delivery	< 42 days	1	Reference		
	≥ 42 days	1.473	0.663	3.273	0.342

*Shows a significant *p-value*.

Statistical Analysis

Statistical analysis was performed using SPSS software, version 23.0. All categorical variables were represented by frequency and percentage. Bivariate logistic regression was used to calculate the odds ratio and confidence interval for indicating the association between the dependent variable prolapse and the independent variables (age, occupation, place of delivery, age at first delivery, socio-economic status, body mass index, route of delivery, parity and resumption of work after delivery). The *p-value* less than 0.05 was considered significant.

Results

Prolapse was diagnosed in 53 women out of 150, giving rate of 35.3%.

The association of pelvic organ prolapse (POP) with various demographic, obstetric, and risk factors provides crucial insights into the causative factors of POP. Age plays a significant role, as women older than 45 years had a higher prevalence of POP (67.9%) compared to those aged 41 to 45 years (32.1%). The adjusted odds ratio for developing POP in women older than 45 years was 2.16 (95% CI: 0.23–0.93, *p* = 0.030). Agriculture as an occupation shows a significant relationship with POP than the labor

class and household job, OR is 1.829. The adjusted OR for illiterate women developing POP was 0.185 (95% CI: 0.04–0.8, $p = 0.02$) and $p = 0.028$. Considering Kuppaswamy Classification for Socio-economic Status, our results show Class IV is significantly associated with POP ($p = 0.015$, C.I- 0.207–0.844). Parity was strongly correlated with POP. Women with five or more deliveries had the highest prevalence (69.8%), followed by those with three to four deliveries (28.3%) and those with two or fewer deliveries (1.9%). The adjusted OR for POP in women with five or more births was 0.238 (95% CI: 0.114–0.495, $p = 0.000$), indicating higher the parity more risk of POP.

The analysis found no significant link between where a woman gave birth and whether she developed pelvic organ prolapsed (POP). However, the age at which a woman had her first delivery was linked to POP. Among women who gave birth before they were 18 years old, 20 (20.6%) had POP, while 42 (79.2%) did not. The adjusted odds ratio for POP in women who delivered after 18 was 0.068 (95% CI: 0.03–0.15, $p = 0.000$). Body mass index (BMI) was another significant risk factor. Among women with BMI > 25, 30.2% had POP, whereas only 8.2% of those with BMI ≤ 25 were affected. The adjusted OR for overweight women developing POP was 0.208 (95% CI: 0.08–0.528, $p = 0.001$). No significant association was found between urinary or bowel complaints and pelvic organ prolapse. Lastly, the timing of resumption of work after delivery also did not show a significant correlation with POP ($p = 0.341$). Among affected women, 79.2% resumed work within 42 days, compared to 72.2% in the non-POP group.

Discussion

The prevalence of POP is different in different countries. The exact prevalence of POP is unreported, as many women do not disclose their condition due to social factors, and a considerable number are asymptomatic.⁷ This shows a shy and callous attitude of society. The studies from Ethiopia and Tanzania revealed the prevalence of POP ranging from 1 to 64.6%, on the basis of clinical examination.^{2,8,9} In Chandigarh, India, 7.6% of women report for POP.¹⁰ An author from South India (includes state of Tamil Nadu, Kerala, Karnataka and Andhra Pradesh) at a Government Hospital reports 1.6% rate of gynecological patients having prolapse.¹¹ While discussing specific criteria for reporting POP, it was recommended by a multinational team of reviewers that the lower and middle-income countries and non-white women should be included in reporting the prevalence. They also recommend that not only the mouth spoken

symptomatology, but a proper clinical examination should also be included before finally declaring the woman to have POP.¹² This study highlights the reported data on the recommended guidelines of recent literature.

Age

Our findings highlight that older age correlates significantly with a higher prevalence of POP within the study population. Demographic and obstetric variables found in different studies in POP also support our study findings (Table 1). Our findings are consistent with other authors, as long as age is concerned for POP.^{7,13-16} A study in Nigeria reports 60.1 as the mean age for POP.¹³ while a recent Indian report documents a mean age of 50.1.¹⁷

Occupation

In our study, most of the women belong to the agricultural worker, housewife, or laborer groups. Those who have worked as agricultural laborers have twice the risk of developing POP, as shown in Table 1. These types of work can increase the risk of POP or make an existing condition worse. The squatting position commonly used by field laborers is a key factor contributing to this issue. Similar results have been found in other recent studies.^{7,14}

Education

The majority (87.3%) of women were found to be illiterate in terms of their educational background. Our findings suggest relation of lower education level and higher incidence of POP. In a similar study, the majority of women were housewives aged between 41 and 50 years and belonged to the low socio-economic group.⁷

Socio-economic Status

Most of the patients in the study belong to socio-economic class III, followed by class IV according to the modified Kuppaswamy scale. Similarly, in studies from 2017 and 2022, most women with prolapse were from the low socio-economic class, followed by the lower middle class, as per the modified B. G. Prasad scale.^{7,11,18} Our results align with these findings (Table 1).

Place of Delivery

Home delivery appears to be a dominant etiological factor for developing POP. In this setting, women prefer to deliver at home in the hands of unqualified and untrained personnel. As such, the idea is to have labor in a friendly and family-like atmosphere. But as per the National Rural Health Mission, Janani Suraksha Yojana (JSY) Scheme, all deliveries should occur in an institute, this recommendation is to avoid maternal deaths due to PPH,

rupture uterus and prolonged labor with septicemia. The grassroot scenario is different. According to NFHS-5, institutional births account for 90.2% of deliveries, with 82.2% of these occurring in public facilities, while 2.5% of births take place at home under the care of skilled health personnel.¹⁹ JSY was implemented in the year 2005. By now, i.e., year 2023, the telltale stories have manifested effects of home delivery after twenty years in the form of POP. The untrained Dai (person who conducts delivery) will make excessive bearing down and in ignorance, the pelvic floor muscles are subjected to excessive stretching. In the long run, along with heavy physical work in a squatting position, the POP is precipitated. In our study majority (70%) of women delivered at home. In some studies, it was found that a significant number of patients had a history of home delivery.^{7,12,20}

Body Mass Index

In this study, statistical analysis shows a very significant *p-value* of 0.000, which means there is a strong link between being overweight and having pelvic organ prolapse. A systematic review and meta-analysis of observational studies found that obesity is a significant associated with pelvic organ prolapse.²¹ Another study from 2012 also showed that obesity is a major risk factor for symptoms of POP.²² Forceps delivery and a BMI >25 are statistically related to higher POP, as per a British report.²³ Few authors have documented that there is no association between POP and BMI.^{7,24}

Route of delivery

In terms of route of delivery, the majority of women, accounting 87.3%, had a vaginal delivery, while a smaller proportion, 12.7%, underwent cesarean section. This distribution highlights the prevalence of vaginal childbirth within the cohort (Table 1). In a retrospective study, higher parity is associated with the POP, particularly among women who gave birth vaginally at home.¹⁵

Parity

In a prospective observational cohort study, stage II POP was found in 56.9% women after their first vaginal birth.²⁵ The majority of participants in the present study had a history of multiple home births. Our study found that parity more than 5 is significantly related to POP ($p=0.000$). This indicates that excessive stretching, tearing, and multiple deliveries are the primary obstetric factors predisposing women to develop POP.³ This finding is consistent with the study, which reported a similar trend,

showing that 94% of women who had delivered two or more children experienced POP (Table 2).^{11,13}

Urinary and bowel complaints

In our study, 78.0% of the women had urinary complaints, while 22.0% did not. This highlights a significant proportion of the cohort facing urinary issues, which can be critical for understanding potential urological health concerns in the study population. In terms of bowel complaints, 31.3% of cases reported experiencing them, while 68.7% did not. This data point sheds light on gastrointestinal health issues within the group, which can impact quality of life and require targeted medical attention. Clinical presentations can vary based on individual concerns and priorities. Pelvic floor-related symptoms do not correspond to the specific anatomical location of prolapse in cases of mild to moderate severity.²⁶

Resumption of work after delivery

Early in the postpartum period, when the pelvic floor is actively healing and regenerating, women may be more vulnerable to increased pelvic floor dysfunction. In the present study, the prevalence of POP does not correlate with the timing of resumption of work after delivery ($p = 0.34$) (Table 1). Our finding is consistent with the study, which shows that pelvic floor health was either unaffected by early postpartum moderate to vigorous physical activity.²⁷ But in another study, the timing of resumption of work has a notable impact on the severity of POP stages.⁷

The study revealed that the demographic distribution of the female population indicates a high prevalence (35%) in rural India. Further, POP is significantly associated with various factors such as age, occupation, education level, body mass index (BMI), parity, and mode of delivery. Specifically, older age groups, individuals engaged in agriculture and manual labor, those with lower educational levels, higher BMI, and those with higher parity were more likely to experience POP. Additionally, vaginal deliveries are reported to be a significant promoting factor for POP compared to cesarean section. Beyond just causing physical discomfort, POP draws attention to the health inequalities that women face around the world. The shame and isolation that follow reflect gender discrimination, socio-cultural inequalities and health inequities.²⁸ POP highlights the complex relationship between human rights and health, emphasizing the urgent need to address this from a women's perspective.

POP is not a mere health condition of women to be referred to a gynecologist; it is a significant part of the post-reproductive morbidity of women. Prolapse related symptoms are under-reported; this might be because women in rural regions may not be as concerned about their quality of life and hence ignore symptoms that do not significantly impact their daily lives. Inequities in access to resources, such as qualified medical personnel and sufficient infrastructure for health care management and prevention, continue to be a barrier. Women's entitlement to health care is further hampered in LMICs, where resources are limited and shame-inducing hurdles to accessing healthcare.^{5,29} A study done in Uganda found that almost 25% of women with POP were rejected by their husbands.³⁰ The most significant obstacle to seeking medical attention and disclosing issues, even to those closest to them, is social stigma, according to qualitative research conducted in Nepal and Bahr Dar. This is because POP affects the most delicate area of the body, the genitalia.^{31,32}

The strength of this study is its sampling strategy, extremely high response rate, and reliable data gathering approach that incorporates clinical validation by a qualified gynecologist and the use of a clear POP-Q staging system. There are, however, also some limitations of this study. Causation cannot be ascertained as the study is cross-sectional and the calculation of the prevalence of POP is based on women's self-reported symptoms; recall and reporting bias might have happened.

Social Background

As per data from a similar hospital run by the same trust, prior to 2004, there were only 50 surgeries for POP performed annually; because they are now provided at no cost, the number has risen significantly. Due to socio-cultural inequities and gender discrimination between males and females, men often refrain from spending on women's health. The various risk factors studied in this venture are there from long time. Multiparity, low socio-economic status, physical work in fields, vaginal delivery in the hands of unqualified people is there since long time in this society. It is a matter of dismay as to how many women attend gynecological outdoor for prolapse of the uterus. The very fact that the surgery needs no economic burden to the pocket of stakeholders brings huge numbers for medical help. Briefing this fact highlights the mentality of socio-cultural inequity and gender discrimination in the rural Malwa region.

Implication

Attention is required at the population level. Efforts must be taken to increase understanding and awareness of the issue and advice on lifestyle to reduce the risk of developing POP by focusing on modifiable risk factors, i.e., parity, heavy weight lifting/carrying, as well as to reduce social stigma by encouraging women to report, provide appropriate treatments, and undergo surgery. A multifaceted strategy that equally prioritizes women's right to dignity, opposes cultural practices that support gender discrimination, and allots equitable funds for gender-sensitive healthcare is necessary for success. To address POP effectively, there is a need for proactive, face-to-face surveys where women are encouraged to voluntarily ask questions, rather than waiting for them to seek medical help from a general physician, allowing women to freely discuss their prolapse-related concerns in a supportive environment.

Limitation

As this study is a single-center study, its findings can not be generalized. The limited sample size may reduce the statistical power of the study, making broader conclusions and statistical associations difficult to establish. As an observational study, it might not establish a causal relationship between risk factors and prolapse. Inaccuracy and recall bias are possible with self-reported medical history data.

Conclusion

Women's age more than 45 years, agriculture laborer by occupation, class IV socio-economic status, BMI more than 25, and parity more than five are significantly associated as aetiology of POP. 35.3% female population of gynecological outdoor is suffering from pelvic organ prolapse.

Ethics Approval and Consent to Participate

Obtained from Institutional Ethics Committee- R. D. Gardi Medical College, Ujjain (IEC Ref. No-ECR/1030/Inst/MP/2018/RR-21 CDSCO). All patients gave informed consent to participate in the study. The committee follows the guidelines of the "Declaration of Helsinki".

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of Interests

The authors declare that they have no competing interests.

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Authors' Contributions

NT conceived the idea of this study. She is responsible for study design, writing the manuscript, editing, and finalizing the text. HD has carried out data collection and personal interaction with patients. She validated the diagnosis of prolapse by clinical examination. RS and KM have finalized and confirmed the manuscript. All authors read and approved the final manuscript.

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