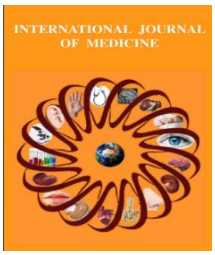

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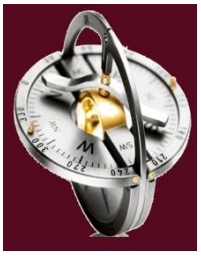

Original Research

Pelvic organ prolapse and it's association with obstetrics and life style factors - A hospital based cross sectional study.

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Abstract

Background: Pelvic organ prolapse (POP) is a common pelvic-floor disorder that can adversely affect urinary, bowel, sexual and psychosocial functioning. Its development is multifactorial, with advancing age, pregnancy, vaginal childbirth, obstetric trauma, obesity and repeated increases in intra-abdominal pressure being important contributors. Identifying associated obstetric and lifestyle factors is essential for developing preventive strategies. *Aim:* To assess pelvic organ prolapse and determine its association with selected obstetric and lifestyle factors among women attending a hospital. *Materials and Methods:* This hospital-based analytical cross-sectional study included 120 women aged 18 years or older attending the Department of Obstetrics and Gynaecology. Participants were recruited consecutively after applying the eligibility criteria. Sociodemographic characteristics, obstetric history, lifestyle exposures and relevant clinical information were obtained using a predesigned and pretested questionnaire. Anthropometric measurements were recorded, and pelvic examination was performed using the Pelvic Organ Prolapse Quantification system. Clinically significant POP was defined as POP-Q stage II or higher. Continuous variables were summarized as mean and standard deviation, while categorical variables were presented as frequencies and percentages. Associations were assessed using Welch's *t*-test, chi-square test or Fisher's exact test, as appropriate. Unadjusted odds ratios with 95% confidence intervals were calculated, and $P<0.05$ was considered statistically significant. *Results:* Clinically significant POP was identified in 43 of the 120 participants, giving a prevalence of 35.8% (95% CI: 27.8%-44.7%). Anterior compartment prolapse was the most frequent pattern (44.2%), and stage II was the most common POP-Q stage (53.5%). Among women with POP, 86.0% reported at least one related symptom; vaginal bulging (79.1%) and pelvic heaviness (67.4%) were the most frequent complaints. Women with POP were significantly older than those without POP (52.7±10.8 versus 43.6±11.4 years; $P<0.001$) and had higher BMI (27.4±4.2 versus 24.8±3.7 kg/m²; $P=0.001$) and parity (3.7±1.5 versus 2.4±1.3; $P<0.001$). Significant obstetric factors included parity ≥3 (OR=3.84), three or more vaginal deliveries (OR=3.63), prolonged or obstructed labour (OR=3.54), home delivery (OR=2.85), birth weight ≥4 kg (OR=3.27), perineal trauma (OR=3.21) and early resumption of strenuous postpartum work (OR=3.51). Significant lifestyle and demographic factors included age ≥50 years (OR=4.38), postmenopausal status (OR=4.08), obesity (OR=2.94), heavy lifting (OR=3.16), chronic constipation (OR=3.27), chronic cough (OR=3.23) and manual or predominantly standing occupation (OR=2.54). *Conclusion:* POP affected more than one-third of the study participants and was associated with advancing age, menopause, obesity, multiparity, repeated vaginal childbirth, difficult labour, obstetric trauma and lifestyle factors that increased intra-abdominal pressure. Risk-based screening, safer obstetric care, adequate postpartum recovery, weight control, pelvic-floor exercises and modification of heavy physical work may help reduce its burden. Further multicentre prospective studies using adjusted analyses are needed.

Keywords: *Pelvic organ prolapse; Obstetric risk factors; Lifestyle factors.*

Introduction

Pelvic organ prolapse (POP) is the downward displacement of one or more pelvic organs, including the uterus, vaginal apex, bladder or rectum, into or through the vaginal canal because of weakening of the pelvic floor muscles, fascia and supporting connective tissues. It is an important reproductive health problem that can substantially affect a woman's physical, urinary, bowel, sexual and psychosocial well-being. Women with POP may present with a vaginal bulge, pelvic pressure, urinary incontinence, difficulty in voiding, constipation, incomplete bowel evacuation, dyspareunia and limitations in routine physical activity. Nevertheless, many women with mild prolapse remain asymptomatic, and social embarrassment or the belief that prolapse is an inevitable consequence of childbirth and ageing may delay healthcare-seeking [1].

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The estimated prevalence of POP varies considerably according to the population studied, case definition and method of assessment. A recent systematic review and meta-analysis estimated the worldwide prevalence at approximately 30.9%; prevalence was higher in studies using physical examination than in those relying on questionnaires [2]. This difference indicates that symptom-based surveys may underestimate the actual burden of the condition. The likelihood of POP also increases with advancing age, making it an increasingly important health concern as female life expectancy rises.

The aetiology of POP is multifactorial. Pregnancy and childbirth are among its most important determinants. High parity, repeated vaginal deliveries, prolonged or obstructed labour, instrumental delivery, perineal trauma and delivery of a macrosomic infant may damage the levator ani muscles, pelvic fascia and pudendal nerves. Evidence from systematic reviews has identified vaginal delivery, increasing parity, higher birth weight, older age and elevated body mass index as significant risk factors for primary prolapse [3]. Inadequate spacing between pregnancies, home delivery without skilled assistance and an early return to strenuous work after childbirth may further impair recovery of the pelvic floor.

Lifestyle and medical factors that repeatedly increase intra-abdominal pressure may also contribute to the development or progression of POP. These include obesity, chronic constipation and straining, chronic cough, smoking and frequent lifting of heavy loads. Occupations involving prolonged standing, squatting, agricultural labour or carrying heavy objects may place additional stress on already weakened pelvic supports [4]. Menopause, connective-tissue abnormalities, previous pelvic surgery and family history may further modify individual susceptibility.

The Pelvic Organ Prolapse Quantification (POP-Q) system provides an objective and reproducible method for describing the anatomical site and stage of prolapse [5]. Despite the considerable clinical burden of POP, information regarding the combined influence of obstetric and lifestyle factors remains limited in many hospital populations. Identification of modifiable determinants is essential for counselling, early detection and preventive interventions. Therefore, the present study assessed pelvic organ prolapse and examined its association with selected obstetric and lifestyle factors among women attending a hospital.

AIM
To assess pelvic organ prolapse and determine its association with obstetric and lifestyle factors among women attending a hospital.

OBJECTIVES
1. To determine the prevalence and clinical pattern of pelvic organ prolapse among the study participants.
2. To assess the association of pelvic organ prolapse with selected obstetric factors.
3. To evaluate the association of pelvic organ prolapse with lifestyle and other relevant sociodemographic factors.

Materials and Methods
Source of Data
The study population consisted of eligible women attending the outpatient and inpatient services of the Department of Obstetrics and Gynaecology at the selected study hospital during the study period. Information was obtained through participant interviews, review of relevant medical and obstetric records, anthropometric measurements and standardized pelvic examination.

Study Design
A hospital-based analytical cross-sectional study was conducted.

Study Location
The study was conducted in the Department of Obstetrics and Gynaecology. Participants were primarily recruited from the gynaecology outpatient department, and eligible women admitted to the gynaecology wards were also considered.

Study Duration
The study was conducted over a period of 12 months. This period included participant recruitment, clinical assessment, data verification, statistical analysis and preparation of the study report.

Sample Size
A total of 120 women were included. Where no reliable local prevalence estimate was available, the sample size was calculated using the single-proportion formula:
A prevalence of 50% was assumed to provide the maximum sample size, with a 95% confidence level and an absolute precision of 9%. The calculated sample size was approximately 119, which was rounded to 120 participants. Eligible women were enrolled consecutively until the required sample size was attained.

Inclusion Criteria
- Women aged 18 years or older attending the selected hospital during the study period.
- Women who were willing to undergo a clinical and pelvic examination.
- Women who provided written informed consent.
- Women with adequate obstetric and lifestyle information available through interview or records.
- Both women with and without clinically demonstrable POP were included to evaluate associated factors.

Exclusion Criteria
- Pregnant women.
- Women within six weeks after childbirth.
- Women with acute pelvic infection, active genital bleeding or any condition that precluded pelvic examination.
- Women with a previously diagnosed pelvic or abdominal malignancy.
- Women who were seriously ill or unable to participate in the interview.

- Women who had undergone surgery specifically for pelvic organ prolapse, when the current anatomical status could not represent primary POP.
- Women who declined consent or had substantially incomplete information.

Procedure and Methodology

After obtaining institutional ethics committee approval and administrative permission, all potentially eligible women were approached during their hospital visit. The purpose and procedure of the study were explained in their preferred language, and written informed consent was obtained.

Each participant was interviewed using a predesigned, pretested structured questionnaire. Sociodemographic information included age, residence, education, occupation and socioeconomic status. Obstetric information included gravidity, parity, age at first childbirth, number and mode of deliveries, place of delivery, prolonged labour, instrumental delivery, birth weight of the largest baby, perineal tear, episiotomy, birth spacing and time taken to resume strenuous work after delivery.

Lifestyle-related variables included occupation-related physical activity, lifting of heavy objects, prolonged standing, squatting, smoking or tobacco exposure, bowel habits, chronic constipation, habitual straining and regular physical activity. Information regarding chronic cough, asthma, chronic obstructive pulmonary disease, menopause, previous hysterectomy, other pelvic surgery and family history of POP was also recorded.

Height and weight were measured using calibrated equipment, and body mass index was calculated as weight in kilograms divided by height in metres squared. Waist circumference was measured using a non-stretchable measuring tape.

A pelvic examination was performed by a trained gynaecologist in a private examination area, with the participant in the dorsal lithotomy position and after emptying her bladder. Examination was performed using a sterile or appropriately disinfected speculum. The anterior, apical and posterior vaginal compartments were assessed while the participant performed maximal straining or the Valsalva manoeuvre. POP was objectively classified using the POP-Q system as stages 0, I, II, III or IV. The predominant compartment and associated findings, including cystocele, uterine or vault prolapse, rectocele and enterocele, were documented.

Sample Processing

No blood, urine, tissue or other biological specimens were routinely collected because the study was based on interviews, anthropometric measurements

Results

Table 1. Overall assessment of pelvic organ prolapse and associated characteristics (N=120)

Parameter	Total (N=120), n (%) or Mean (SD)	POP present (n=43)	POP absent (n=77)	Effect estimate (95% CI)	Test of significance	P value
Age, years	46.9 (12.0)	52.7 (10.8)	43.6 (11.4)	MD=9.10 years (4.93-13.27)	Welch's t=4.34	<0.001*
BMI, kg/m²	25.7 (4.1)	27.4 (4.2)	24.8 (3.7)	MD=2.60 kg/m² (1.07-4.13)	Welch's t=3.39	0.001*
Parity	2.9 (1.5)	3.7 (1.5)	2.4 (1.3)	MD=1.30 (0.76-1.84)	Welch's t=4.77	<0.001*
Age ≥50 years	51 (42.5)	28 (65.1)	23 (29.9)	OR=4.38 (1.98-9.70)	χ^2=14.03	<0.001*
Multiparity, parity ≥3	56 (46.7)	29 (67.4)	27 (35.1)	OR=3.84 (1.74-8.46)	χ^2=11.62	0.001*
Obesity†	31 (25.8)	17 (39.5)	14 (18.2)	OR=2.94 (1.27-6.83)	χ^2=6.57	0.010*
Postmenopausal status	47 (39.2)	26 (60.5)	21 (27.3)	OR=4.08 (1.85-8.99)	χ^2=12.76	<0.001*
Regular heavy lifting	46 (38.3)	24 (55.8)	22 (28.6)	OR=3.16 (1.45-6.88)	χ^2=8.66	0.003*
Chronic constipation	39 (32.5)	19 (44.2)	20 (26.0)‡	OR=2.25 (1.02-4.97)	χ^2=4.17	0.041*
Clinically significant POP	43 (35.8)			Prevalence=35.8% (27.8%-44.7%)	One-sample z=−3.10§	0.002*

†Obesity was defined according to the BMI criterion adopted in the study protocol.

‡This distribution was used only in Table 1 as an overall summary; Table 4 presents the detailed illustrative lifestyle analysis.

§Compared with a reference proportion of 50%.

Among the 120 study participants, clinically significant pelvic organ prolapse (POP) was identified in 43 women, giving a prevalence of 35.8% (95% CI: 27.8%-44.7%). This proportion was significantly lower than the reference proportion of 50% (z=−3.10, P=0.002). Women with POP were significantly older than those without POP, with mean ages of 52.7±10.8 and 43.6±11.4 years, respectively. The mean difference was 9.10 years (95% CI: 4.93-13.27; Welch's t=4.34, P<0.001). Mean BMI was also significantly higher among women with POP than among those without POP (27.4±4.2 versus 24.8±3.7 kg/m²), with a mean difference of 2.60 kg/m² (95% CI: 1.07-4.13; P=0.001). Similarly, mean parity was higher in the POP group (3.7±1.5) than in the non-POP group (2.4±1.3), with a mean difference of 1.30 births (95% CI: 0.76-1.84; P<0.001). Women aged ≥50 years had 4.38 times higher odds of POP than younger women (95% CI: 1.98-9.70; P<0.001). Multiparity was associated with 3.84 times higher odds of POP (95% CI: 1.74-8.46; P=0.001), while obesity increased the odds by 2.94 times (95% CI: 1.27-6.83; P=0.010). Postmenopausal women had approximately fourfold higher odds of POP (OR=4.08; 95% CI: 1.85-8.99; P<0.001). Regular heavy lifting (OR=3.16; 95% CI: 1.45-6.88; P=0.003) and chronic constipation (OR=2.25; 95% CI: 1.02-4.97; P=0.041) were also significantly associated with POP.

Table 2. Prevalence and clinical pattern of pelvic organ prolapse (N=120)

Clinical finding	n (%)	95% CI	Test of significance	P value
Overall POP status				
Clinically significant POP present	43 (35.8)	27.8%-44.7%	z=−3.10†	0.002*
POP absent or stage 0-I	77 (64.2)	55.3%-72.2%		
Predominant anatomical compartment among women with POP (n=43)				
Anterior compartment prolapse	19 (44.2)	30.4%-58.9%	χ^2=2.42‡	0.298
Apical/uterine prolapse	13 (30.2)	18.6%-45.1%		
Posterior compartment prolapse	11 (25.6)	14.9%-40.2%		
POP-Q stage among women with POP (n=43)				
Stage II	23 (53.5)	38.9%-67.5%	χ^2=10.09‡	0.006*
Stage III	14 (32.6)	20.5%-47.5%		
Stage IV	6 (14.0)	6.6%-27.3%		
Symptoms among women with POP (n=43)§				
Any prolapse-related symptom	37 (86.0)	72.7%-93.4%	z=4.73†	<0.001*
Sensation of vaginal bulge	34 (79.1)	64.8%-88.6%	z=3.81†	<0.001*
Pelvic heaviness or dragging pain	29 (67.4)	52.5%-79.5%	z=2.28†	0.023*
Urinary symptoms	22 (51.2)	36.8%-65.4%	z=0.15†	0.879
Bowel symptoms	15 (34.9)	22.4%-49.8%	z=−1.98†	0.048*
Sexual discomfort/dyspareunia¶	9 (29.0)	16.1%-46.6%	z=−2.34†	0.019*

†One-sample proportion z-test against a reference proportion of 50%.
‡Chi-square goodness-of-fit test examined the overall distribution across categories.
§Symptoms were not mutually exclusive.
¶Calculated among 31 sexually active women with POP.

Clinically significant POP was present in 43 (35.8%) participants, whereas 77 (64.2%) had no POP or only POP-Q stage 0-I. Among the 43 affected women, anterior compartment prolapse was the most frequent anatomical pattern, occurring in 19 (44.2%), followed by apical or uterine prolapse in 13 (30.2%) and posterior compartment prolapse in 11 (25.6%). However, the distribution across the three anatomical compartments did not differ significantly (χ^2=2.42, P=0.298). Regarding severity, POP-Q stage II was the most common stage, affecting 23 (53.5%) women, followed by stage III in 14 (32.6%) and stage IV in 6 (14.0%). The distribution of POP-Q stages was statistically significant (χ^2=10.09, P=0.006), showing a predominance of stage II disease.

Of the women with POP, 37 (86.0%) reported at least one prolapse-related symptom (95% CI: 72.7%-93.4%; P<0.001). A sensation of a vaginal bulge was the most common symptom, reported by 34 (79.1%) women (P<0.001), followed by pelvic heaviness or dragging pain in 29 (67.4%; P=0.023). Urinary symptoms were reported by 22 (51.2%) women, a proportion that did not differ significantly from 50% (P=0.879). Bowel symptoms were present in 15 (34.9%; P=0.048), while sexual discomfort or dyspareunia occurred in 9 of the 31 sexually active women with POP (29.0%; P=0.019). Because symptoms were not mutually exclusive, individual participants could have reported more than one complaint.

Table 3. Association of pelvic organ prolapse with selected obstetric factors (N=120)

Obstetric factor	POP present (n=43), n (%)	POP absent (n=77), n (%)	Unadjusted OR (95% CI)	Test of significance	P value
Parity ≥3	29 (67.4)	27 (35.1)	3.84 (1.74-8.46)	χ^2=11.62	0.001*
Three or more vaginal deliveries	31 (72.1)	32 (41.6)	3.63 (1.62-8.13)	χ^2=10.32	0.001*
History of prolonged/obstructed labour	18 (41.9)	13 (16.9)	3.54 (1.51-8.29)	χ^2=8.98	0.003*
History of home delivery	20 (46.5)	18 (23.4)	2.85 (1.28-6.33)	χ^2=6.82	0.009*
Birth weight of largest baby ≥4 kg	13 (30.2)	9 (11.7)	3.27 (1.26-8.49)	χ^2=6.34	0.012*
Obstetric perineal tear or episiotomy complication	16 (37.2)	12 (15.6)	3.21 (1.34-7.68)	χ^2=7.21	0.007*
Resumption of strenuous work within six weeks postpartum	27 (62.8)	25 (32.5)	3.51 (1.61-7.66)	χ^2=10.33	0.001*
History of instrumental vaginal delivery	11 (25.6)	9 (11.7)	2.59 (0.97-6.90)	χ^2=3.84	0.050
First childbirth before 20 years of age	21 (48.8)	23 (29.9)	2.24 (1.03-4.89)	χ^2=4.27	0.039*
Interpregnancy interval <2 years	24 (55.8)	31 (40.3)	1.87 (0.88-3.99)	χ^2=2.69	0.101
History of caesarean delivery only	6 (14.0)	19 (24.7)	0.50 (0.18-1.36)	χ^2=1.92	0.166

Several obstetric factors were significantly associated with POP. Parity ≥3 was observed in 67.4% of women with POP compared with 35.1% of those without POP and was associated with 3.84 times higher odds of prolapse (95% CI: 1.74-8.46; P=0.001). Similarly, women with three or more vaginal deliveries had 3.63 times higher odds of POP (95% CI: 1.62-8.13; P=0.001). A history of prolonged or obstructed labour was reported by 41.9% of women with POP and 16.9% without POP, corresponding to an OR of 3.54 (95% CI: 1.51-8.29; P=0.003). Home delivery was also significantly associated with POP (OR=2.85; 95% CI: 1.28-6.33; P=0.009).

Women who had delivered a baby weighing ≥4 kg had 3.27 times higher odds of POP (95% CI: 1.26-8.49; P=0.012). Obstetric perineal tears or complications related to episiotomy were more common in the POP group and increased the odds of prolapse by approximately threefold (OR=3.21; 95% CI: 1.34-7.68; P=0.007). Resumption of strenuous work within six weeks after childbirth was reported by 62.8% of women with POP compared with 32.5% without POP and was significantly associated with the condition (OR=3.51; 95% CI: 1.61-7.66; P=0.001). First childbirth before 20 years of age was also associated with increased odds of POP (OR=2.24; 95% CI: 1.03-4.89; P=0.039). Instrumental vaginal delivery demonstrated a borderline association (OR=2.59; P=0.050). In contrast, an interpregnancy interval of less than two years was not significantly associated with POP (P=0.101). Caesarean delivery alone showed lower odds of POP, but the association was not statistically significant (OR=0.50; 95% CI: 0.18-1.36; P=0.166).

Table 4. Association of pelvic organ prolapse with lifestyle and sociodemographic factors (N=120)

Lifestyle or sociodemographic factor	POP present (n=43), n (%)	POP absent (n=77), n (%)	Unadjusted OR (95% CI)	Test of significance	P value
Age ≥50 years	28 (65.1)	23 (29.9)	4.38 (1.98-9.70)	χ^2=14.03	<0.001*
Postmenopausal status	26 (60.5)	21 (27.3)	4.08 (1.85-8.99)	χ^2=12.76	<0.001*
Obesity	17 (39.5)	14 (18.2)	2.94 (1.27-6.83)	χ^2=6.57	0.010*
Regular lifting of loads ≥10 kg	24 (55.8)	22 (28.6)	3.16 (1.45-6.88)	χ^2=8.66	0.003*
Chronic constipation with straining	19 (44.2)	15 (19.5)	3.27 (1.43-7.47)	χ^2=8.29	0.004*
Chronic cough	14 (32.6)	10 (13.0)	3.23 (1.29-8.12)	χ^2=6.61	0.010*
Predominantly standing/manual occupation	23 (53.5)	24 (31.2)	2.54 (1.18-5.45)	χ^2=5.80	0.016*
Low level of regular physical exercise	27 (62.8)	35 (45.5)	2.02 (0.94-4.35)	χ^2=3.33	0.068
Rural residence	30 (69.8)	42 (54.5)	1.92 (0.87-4.24)	χ^2=2.66	0.103
Education below secondary level	25 (58.1)	31 (40.3)	2.06 (0.97-4.40)	χ^2=3.54	0.060
Current smokeless-tobacco or smoking exposure	8 (18.6)	7 (9.1)	2.29 (0.77-6.79)	χ^2=2.31	0.129
Previous pelvic surgery	7 (16.3)	6 (7.8)	2.30 (0.72-7.35)	Fisher's exact test	0.221

Age and menopausal status demonstrated the strongest sociodemographic associations with POP. Women aged ≥50 years had 4.38 times higher odds of POP than younger women (95% CI: 1.98-9.70; P<0.001), while postmenopausal women had 4.08 times higher odds than premenopausal women (95% CI: 1.85-8.99; P<0.001). Obesity was present in 39.5% of women with POP compared with 18.2% without POP and was significantly associated with nearly threefold higher odds of prolapse (OR=2.94; 95% CI: 1.27-6.83; P=0.010).

Lifestyle factors associated with repeated increases in intra-abdominal pressure were also important. Regular lifting of loads weighing ≥10 kg was associated with 3.16 times higher odds of POP (95% CI: 1.45-6.88; P=0.003). Chronic constipation with straining increased the odds by 3.27 times (95% CI: 1.43-7.47; P=0.004), while chronic cough increased them by 3.23 times (95% CI: 1.29-8.12; P=0.010). A predominantly standing or manual occupation was significantly more frequent among women with POP and was associated with 2.54 times higher odds of the condition (95% CI: 1.18-5.45; P=0.016).

Low physical activity showed a possible association with POP, but it did not reach statistical significance (OR=2.02; P=0.068). Similarly, rural residence (P=0.103), education below the secondary level (P=0.060), smoking or smokeless-tobacco exposure (P=0.129), and previous pelvic surgery (P=0.221) were not significantly associated with POP. Although the direction of their odds ratios suggested possible increases in risk, the corresponding 95% confidence intervals included unity.

Discussion

Table 1: Overall assessment of POP and associated characteristics

The present study found clinically significant pelvic organ prolapse (POP) in 35.8% of the 120 participants. This estimate is higher than the 22.7% pooled prevalence reported in Ethiopia by Addisu et al. (2023)[1] but is close to the worldwide pooled prevalence of 30.9% reported by Hadizadeh-Talasaz et al. (2024)[2]. The latter meta-analysis also reported a higher prevalence in examination-based studies (41.8%) than in questionnaire-based studies (25.0%), which may explain the relatively high prevalence in the present hospital-based study. Similarly, Siyoum et al. (2024)[3] found anatomical stage II-IV prolapse in 30.9% of examined Ethiopian women. Conversely, Pang et al. (2021)[4] reported a considerably lower prevalence of symptomatic POP of 9.6% in a large Chinese population survey. Differences in study setting, participant age, parity, healthcare-seeking behaviour and whether POP was defined by symptoms or clinical examination probably account for this variation.

Women with POP were, on average, 9.1 years older than women without POP, and age ≥50 years was associated with more than fourfold higher odds of prolapse. This agrees with Pang et al. (2021)[4], who found that the prevalence and severity of POP increased progressively with age. Masenga et al. (2018)[5] also identified advancing age as an important predictor of POP in rural Tanzania. Age-related loss of skeletal muscle strength, reduced oestrogen following menopause, deterioration of pelvic connective tissue and the cumulative effects of childbirth and sustained intra-abdominal pressure may explain this relationship. Accordingly, postmenopausal women in the present study had 4.08 times higher odds of POP. Brown et al. (2022)[6] similarly concluded that POP prevalence increases markedly with advancing age and that the future disease burden

is likely to rise as the population ages.

The mean BMI was significantly higher in women with POP, and obesity was associated with 2.94 times higher odds of prolapse. This is consistent with the updated systematic review by Schulten et al. (2022)[7], in which BMI was a significant risk factor for primary POP, with a pooled OR of 1.75. Obesity may contribute through persistent elevation of intra-abdominal pressure and chronic mechanical loading of the pelvic floor. Mean parity was also significantly higher in the POP group, and parity ≥3 increased the odds of POP by 3.84 times. Akter et al. (2016)[8] and Dheresa et al. (2019)[9] likewise identified higher parity as an important correlate of pelvic floor disorders. Regular heavy lifting and chronic constipation were significantly associated with POP, supporting the concept that repeated increases in intra-abdominal pressure weaken already compromised pelvic support structures.

Table 2: Prevalence and clinical pattern of POP

Anterior compartment prolapse was the most frequent anatomical pattern, accounting for 44.2% of POP cases, followed by apical or uterine prolapse in 30.2% and posterior compartment prolapse in 25.6%. Although anterior prolapse was numerically more common, the overall distribution across compartments was not statistically significant. This pattern is consistent with Pang et al. (2021)[4], whose nationwide Chinese study identified anterior compartment prolapse as the predominant form of symptomatic POP. Anterior support is particularly vulnerable because vaginal childbirth can damage the pubocervical fascia and levator ani attachment, predisposing women to cystocele and urethrovesical descent.

Stage II was the most common POP-Q stage in the present study, comprising 53.5% of cases, followed by stage III in 32.6% and stage IV in 14.0%. The stage distribution was significant, indicating a predominance of moderately advanced rather than severe prolapse. Pang et al. (2021)[4] similarly found stage II to be the most frequent symptomatic stage. Siyoum et al. (2024)[3] reported that 30.9% of examined women had stage II-IV anatomical prolapse, while 78.5% of women with anatomical prolapse experienced symptoms. The predominance of stage II may reflect increasing symptom recognition and attendance before the condition progresses beyond the hymen. Nevertheless, the combined proportion of stage III-IV disease in the present study was 46.6%, suggesting that a substantial number of women still sought care relatively late.

Any prolapse-related symptom was reported by 86.0% of affected women. Vaginal bulging was the most frequent symptom, affecting 79.1%, followed by pelvic heaviness or dragging pain in 67.4%. These findings are clinically plausible because the perception of a vaginal bulge is the symptom most directly related to descent at or beyond the hymen. Brown et al. (2022)[6] noted that the estimated prevalence varies markedly depending on whether POP is identified through symptoms or physical examination, since early anatomical prolapse may remain asymptomatic. Urinary symptoms occurred in 51.2% of affected women, whereas bowel symptoms were reported by 34.9%. This indicates that POP frequently involves functional disturbances beyond the sensation of a bulge, although urinary symptoms were not significantly different from the 50% reference proportion.

Sexual discomfort or dyspareunia was reported by 29.0% of sexually active women with POP. This finding highlights the effect of POP on intimate relationships and quality of life, but it must be interpreted cautiously because it was calculated from only 31 sexually active participants. Moreover, sexual symptoms may be underreported because of embarrassment and sociocultural barriers. The high symptomatic proportion observed in the present study was greater than the population-level proportion expected in community surveys, probably because symptomatic women were more likely to attend a hospital.

Table 3: Association with obstetric factors

Multiparity and repeated vaginal childbirth were strongly associated with POP. Women with parity ≥3 had 3.84 times higher odds, while those with three or more vaginal deliveries had 3.63 times higher odds of prolapse. These findings are consistent with Schulten et al. (2022)[7], who classified parity and vaginal delivery as confirmed risk factors for primary POP. Pregnancy stretches the pelvic connective tissues, while vaginal delivery may cause levator ani avulsion, fascial disruption and pudendal nerve injury. Repeated deliveries allow less complete recovery and increase cumulative pelvic-floor damage. Akter et al. (2016)[8] similarly found increasing age and parity to be important predictors of symptomatic POP in rural Bangladesh.

Prolonged or obstructed labour was associated with 3.54 times higher odds of POP. This estimate was comparable with the pooled OR of 4.63 reported by Addisu et al. (2023)[1]. Prolonged pressure from the presenting fetal part can cause ischaemic and mechanical injury to the levator muscles, endopelvic fascia and pelvic nerves. Asresie et al. (2016)[10] also identified prolonged labour and obstetric factors as important determinants of POP among Ethiopian gynaecological patients.

Home delivery was associated with an OR of 2.85, closely matching the pooled OR of 2.93 reported by Addisu et al. (2023)[1]. Masenga et al. (2018)[5] also found home delivery to be associated with POP in rural Tanzania. Home delivery may act as a proxy for limited access to skilled birth attendance, delayed management of obstructed labour and inadequate recognition or repair of birth-canal injuries. It should not necessarily be interpreted as a direct causal factor independent of the quality and duration of labour.

Delivery of a baby weighing ≥4 kg increased the odds of POP by 3.27 times. Schulten et al. (2022)[7] confirmed increasing birth weight as a significant risk factor for primary POP. A macrosomic fetus may produce greater distension of the genital hiatus and increase the probability of muscular, fascial and neurological trauma. Similarly, a history of perineal tear or episiotomy-related complication was associated with an OR of 3.21. Addisu et al. (2023)[1] reported an even stronger pooled association between perineal tear and POP (OR=4.83), supporting the role of obstetric trauma in the loss of pelvic support.

Instrumental vaginal delivery showed a borderline association in the present study (OR=2.59, P=0.050). Although its confidence interval included unity, the magnitude and direction were compatible with the pooled OR of 3.70 reported by Addisu et al. (2023)[1]. The borderline result may have arisen from the small number of participants with instrumental delivery and limited statistical power.

Resumption of strenuous work within six weeks postpartum increased the odds of POP by 3.51 times. This agrees with observations from resource-limited settings in which women frequently resume agricultural work, load carrying and strenuous household activity before adequate pelvic-floor recovery. Henok (2017)[11] demonstrated a relationship between prolonged back-loading activities and POP among Ethiopian women. Early first childbirth was also significantly associated with POP in

the present study. Pelvic tissues may be more vulnerable when childbirth occurs before full physical maturation, while early childbirth also increases the opportunity for a higher lifetime parity. In contrast, a short interpregnancy interval was not significantly associated with POP.

Women with a history of caesarean delivery alone had lower odds of POP, although the result was not statistically significant. Schulten et al. (2022)[7] reported a significant protective association for caesarean delivery in pooled analysis. However, caesarean delivery cannot be recommended solely to prevent POP because it carries important short- and long-term maternal risks. The present findings should therefore be interpreted as evidence of differential pelvic-floor exposure rather than as a basis for selecting the mode of delivery.

Table 4: Lifestyle and sociodemographic factors

Regular lifting of loads ≥10 kg was associated with 3.16 times higher odds of POP. This was almost identical to the pooled OR of 3.23 for carrying heavy objects reported by Addisu et al. (2023)[1]. Henok (2017)[11] also found that the duration of heavy back-loading work was associated with prolapse. Repetitive lifting produces transient elevations in intra-abdominal pressure; when repeated over many years, particularly after childbirth-related pelvic-floor injury, it may contribute to progressive descent. Nevertheless, Bø et al. (2023)[12] concluded that evidence regarding strenuous physical activity and POP remains heterogeneous. Their review suggested that strenuous exercise may increase POP symptoms or reduce pelvic support in some women, but the effects probably depend on exercise type, intensity and individual pelvic-floor capacity.

A predominantly standing or manual occupation was associated with 2.54 times higher odds of POP. This finding was consistent with the heavy-lifting association and suggests that cumulative occupational loading may be more relevant than general physical activity alone. Conversely, a low level of regular exercise did not reach statistical significance. This distinction is important because ordinary or moderate exercise should not be equated with repetitive occupational lifting. Appropriate physical activity may support general health and weight control, whereas poorly controlled high-load activity may impose excessive pressure on a weakened pelvic floor.

Chronic constipation with straining was associated with 3.27 times higher odds of POP, while chronic cough was associated with 3.23 times higher odds. Akter et al. (2016)[8] identified constipation and chronic obstructive pulmonary disease as predictors of symptomatic POP. Obsa et al. (2022)[13] also reported associations involving chronic cough, constipation and previous pelvic-floor or obstetric injury. Both conditions expose the pelvic floor to recurrent increases in intra-abdominal pressure and may accelerate the progression of an existing support defect. Management of constipation and chronic respiratory illness may therefore represent practical components of POP prevention and conservative management.

Rural residence, education below the secondary level, tobacco exposure and previous pelvic surgery were not significantly associated with POP. Dheresa et al. (2019)[9] reported that socioeconomic and reproductive conditions influenced pelvic floor disorders, while other studies from low-resource settings have found rural residence to be associated with POP. In the present study, rural residence may have been confounded by parity, occupation, home delivery and access to maternity services. Similarly, the borderline association with lower education may reflect limited statistical power rather than absence of a relationship. Tobacco exposure was uncommon and therefore produced an imprecise estimate. Schulten et al. (2022)[7] reported an inverse pooled association between smoking and anatomical POP, but this finding should not be interpreted as a beneficial effect because smoking contributes to chronic cough and numerous serious health outcomes.

Conclusion

Pelvic organ prolapse was a common clinical condition among women attending the study hospital, with clinically significant POP identified in 35.8% of participants. Anterior compartment prolapse was the most frequent anatomical pattern, and POP-Q stage II was the predominant stage. Most affected women were symptomatic, particularly with a sensation of vaginal bulging and pelvic heaviness.

POP was significantly associated with advancing age, postmenopausal status, higher BMI and multiparity. Important obstetric factors included repeated vaginal deliveries, prolonged or obstructed labour, home delivery, delivery of a macrosomic baby, obstetric perineal trauma, childbirth before 20 years of age and early resumption of strenuous work after delivery. Lifestyle factors involving repeated increases in intra-abdominal pressure—particularly heavy lifting, chronic constipation, chronic cough and manual or predominantly standing occupations—were also significantly associated with POP.

These findings indicate that POP has a multifactorial origin involving cumulative obstetric trauma, age-related weakening of pelvic support and potentially modifiable lifestyle exposures. Women at increased risk should be identified during antenatal, postnatal and routine gynaecological care. Preventive measures should include skilled institutional delivery, appropriate management of prolonged labour, adequate postpartum rest, weight management, treatment of constipation and chronic cough, pelvic-floor muscle training and education regarding safe lifting practices. As the observed relationships were cross-sectional and primarily unadjusted, prospective studies with multivariable analysis are required to confirm their independent and causal contributions.

LIMITATIONS OF STUDY

1. The hospital-based design may have introduced selection bias because women attending a hospital may have had more symptoms or advanced disease than women in the general population.
2. The study was conducted at a single centre with a relatively small sample of 120 women, limiting the precision and generalizability of the findings.
3. The cross-sectional design could establish associations but could not determine temporal or causal relationships between the identified factors and POP.
4. Obstetric and lifestyle histories were largely self-reported and were therefore susceptible to recall bias, particularly among older and multiparous women.
5. Sensitive symptoms such as sexual discomfort, urinary leakage and bowel dysfunction may have been underreported because of embarrassment or sociocultural barriers.
6. Heavy lifting, strenuous work and physical activity may not have been measured objectively with respect to duration, frequency, cumulative load and lifting technique.

7. Some variables, including prolonged labour, birth weight of the largest baby and perineal injury, might not have been verified from medical records for all participants.
8. Only 31 sexually active women with POP contributed information regarding dyspareunia, reducing the precision of the estimate for sexual dysfunction.
9. The reported odds ratios were primarily unadjusted; therefore, residual confounding among age, menopausal status, parity, BMI, occupation and mode of delivery could not be excluded.
10. Women who were pregnant, recently postpartum, seriously ill or previously treated surgically for POP were excluded; consequently, the findings may not apply to these groups.
11. The study did not assess pelvic-floor muscle strength, levator ani injury, connective-tissue disorders or genetic susceptibility, which may influence the development of POP.
12. The study did not evaluate the longitudinal progression of prolapse, treatment outcomes or changes in quality of life.

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