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Risk Factors, Prevalence and Assessment of the Degree of Pelvic Organ Prolapse: A Comparative Study in Secondary Level Hospital in Nepal

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Abstract

Introduction: Pelvic organ prolapse is the commonest morbidity worldwide. It is one of the leading reproductive health problems among Nepalese women, particularly among the women in rural Nepal.

Objective: To determine the prevalence, associated risk factors, and degree of pelvic organ prolapse among women attending a secondary level hospital in Nepal.

Methods: A comparative cross-sectional study was conducted at Bhaktapur Hospital, from January to June 2023. A total of 256 women aged 40-60 years were enrolled in the study consisting of 121 in study group and 135 in control group using purposive sampling method. Pessary use, past medical and surgical history, obstetric and non-obstetric risk factors were noted. General, systemic, and pelvic examinations were part of the clinical evaluation, and pelvic organ prolapse was graded using the simplified Pelvic Organ Prolapse Quantification system. Frequencies of variables were calculated, and comparisons between groups were evaluated using chi square tests.

Results: The prevalence of pelvic organ prolapse was 17.82% among women aged 40-60 years, while it was 3.09% among all gynecological cases. Risk factors such as age at first vaginal birth <20 years, multiparity, vaginal delivery, short pregnancy gap, home birth of large infants, smoking, and insufficient postpartum rest, were identified. Common symptoms were something coming out per vagina (98.3%), heaviness in vagina (96.7%), feeling of lump at introitus (95.9%), Backache/dragging sensation (59.5%) and chronic cough/respiratory infection (56.2%). Majority (54.55%) had stage III prolapse and multi- compartment prolapse (43.8%).

Conclusion: Raising awareness about delaying marriage and childbirth, contraceptive use, adequate rest, and proper nutrition may help reduce pelvic organ prolapse burden.

Keywords: Pelvic organ prolapse; risk factor, nepal.

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Introduction

Pelvic orgran prolapse is a condition characterized by the descent of pelvic organs, including the bladder, uterus, rectum, or vaginal apex, into or beyond the vaginal canal due to weakening of the supporting muscles, fascia, and ligaments.[1] Globally, the prevalence of pelvic organ prolapse (POP) is estimated at 2-20% among women under 45 years of age,[2] while in Western populations, it has been reported to reach as high as 41%.[3] In 2002, Women's Health Initiative study reported that almost 14.2% women in USA had genital prolapse.[4]

POP has a lifetime risk of 30-50% and its incidence increases with age.[5] It is a significant public health problem in Nepal as well as in India and it is prevalent in all states and ecological regions, across all castes and ethnicities.[6] Between 600,000 and more than 1 million of reproductive age group Nepali women suffer from genital prolapse and about 40% of women developed it after birth of their first child.[7,8] In Nepal, although uterine prolapse appears to be widespread, little data have been published about its etiology.[9] Understanding its prevalence, associated risk factors, and severity is essential for planning effective prevention, awareness, and management strategies. This study therefore aims to determine the prevalence, risk factors, and degree of POP among women aged 40-60 years.

Methods

This comparative cross-sectional study was conducted at Bhaktapur Hospital, a secondary level hospital, from January to June 2023. Women aged 40-60 years attending the Gynecology Outpatient Department (GOPD) and who were referred out from different hospitals for gynecological problems through health camp were enrolled using non-probability purposive sampling method. The sample size for this study was 256 participants including study group (121) and control group (135). The minimum required sample size for this study was calculated using the standard formula for prevalence studies: $n=Z^2 \cdot p \cdot (1-p)/d2n = Z^2 \cdot p \cdot (1 - p) / d^2n=Z^2 \cdot p \cdot (1-p)/d2$, where Z=1.96Z = 1.96Z=1.96 (95% confidence interval), p=0.218p = 0.218p=0.218 (estimated prevalence of pelvic organ prolapse), and d=0.05d = 0.05d=0.05 (margin of error). Based on this calculation, the required sample size was approximately 262 participants. However, due to logistical constraints and participant availability during the study period, a total of 256 women were enrolled. This slight reduction is unlikely to materially affect the precision of prevalence estimates, as the sample remains close to the calculated requirement and provides adequate statistical power for the study objectives.

The sample size was based on preliminary GOPD data, where 412 women aged 40-60 years attended in one month, and 90 had pelvic organ prolapse (p=21.8%) Using the formula for prevalence studies:

$$n = \frac{Z^2.p.(1-p)}{d^2}$$

where, Z=1.96 (95% CI) and d=0.05 (5% margin of error):

$$n = \frac{(1.96)^2.0.218.0.782}{0.05^2} = 256$$

All women, aged 40-60 years, attending GOPD, were recruited for the study. Among them, patients who gave the history of POP or symptoms related to POP were grouped as group I and those patients who belonged to same age group but did not give the history of prolapse or symptoms related to prolapse, rather attended OPD with other gynecological problems were grouped as control in group II. Patients were excluded if they were attending the GOPD only for pregnancy checkup or confirmation, had a wound infection, were visiting for post-operative follow-up, had vesicovaginal fistula, carcinoma of the cervix, or severe critical medical conditions such as congestive heart failure or myocardial infarction, or if they had recurrent prolapse or vault prolapse.

All participants provided written informed consent before enrollment. Pretesting was conducted on 10 cases. So, a pretested proforma was used to collect demographic data (age, ethnicity, education, residence, occupation), obstetric history (parity, mode and place of delivery, complications, birth spacing, instrumental deliveries, baby weight, labor duration, postpartum work resumption), and non-obstetric risk factors (smoking, chronic cough, constipation). Medical and surgical history, including prior prolapse treatment and pessary use was also recorded. Clinical assessment included general examination, systemic evaluation, and pelvic examination. POP was graded using the simplified POP-Q system10 for anterior, posterior and apical compartments which is given as:

Stages	Descriptions
I	Prolapse is at least 1 cm above the hymenal remnants.
II	Prolapse extending from above to 1 cm below the hymanal remnants.
III	Prolapse greater than 1 cm past the hymenal remnants but does not represent complete vaginal wall eversion.
IV	complete vaginal vault eversion or complete procidentia

Stress urinary incontinence, levator ani tone, perineal integrity, and rectovaginal anatomy were assessed. Bimanual examination evaluated uterine and adnexal structures. Data was recorded in a standardized proforma and securely stored in Microsoft Excel 365. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 17.0. Frequencies of relevant variables were determined. Each group was compared with the reference group and statistical difference between the two groups were evaluated by using chi-square tests.

Results

Total number of gynecological cases who visited in gynecological outpatient department during the period of 3 months was 7117. Among them, 1234 cases were in the 40-60 years age group, and there were 220 cases of prolapse. According to this data, prevalence of pelvic organ prolapse during that period in the 40-60 years age group was found to be 17.82%. However, prevalence of prolapse among total gynecological cases was found to be 3.09%. Altogether, total 256 cases were enrolled in this study and among

them, 47% of patients had pelvic organ prolapse (n=121), which were grouped as group I and 53% of patients of same age group without pelvic organ prolapse (n=135) were grouped as group II.

Age distribution differed significantly between the groups, with Group I having a higher proportion of participants aged 51-60 years, while Group II predominantly included those aged 40-50 years ($p < 0.001$). Ethnicity, education level, place of residence, and occupation were similarly distributed between the two groups, with no statistically significant differences observed ($p > 0.05$). (Table 1)

Table 1: Demographic Profile of Study Participants.

Parameter	Group I (n=121)		Group II (n=135)		p value
	N	%	N	%	
Age (years)					
40-50	48	39.7	101	74.8	<0.001
51-60	73	60.3	34	25.2	
Ethnicity					
Brahmin	23	19.0	34	25.2	0.12
Chhetri	34	28.1	36	26.7	
Newar	19	15.7	24	17.8	
Others	45	37.2	41	30.3	
Education					
Graduate and above	2	1.7	5	3.7	0.101
Secondary	1	0.8	8	5.9	
Primary school/literate	13	10.7	15	11.1	
Illiterate	105	86.8	107	79.3	
Place of residence					
Terai	38	31.4	34	25.2	0.214
Hills	57	47.2	57	42.2	
Mountain	13	10.7	8	5.9	
Valley	13	10.7	36	26.7	
Occupation					
Service	2	1.7	5	3.7	0.458
Professional	2	1.7	2	1.5	
Business	5	4.1	10	7.4	
Farmers	54	44.6	48	35.6	
Laborers	23	19.0	22	16.3	
Housewife	35	28.9	48	35.6	

The table compares obstetric and reproductive risk factors between Group I and Group II. Group I had significantly earlier age at first childbirth, shorter birth spacing, higher parity, and earlier onset of POP, mostly after the first to third deliveries.

Table 2: Obstetrical risk factors of pelvic organ prolapse.

Parameter	Group I (n=121)		Group II (n=135)		p value
	N	%	N	%	
Age at 1st child birth (years)					
15-20	98	81.0	45	33.3	<0.001
21-25	17	14.0	74	54.8	
26-30	5	4.1	13	9.6	
31-35	0	0.0	2	1.5	
>35	1	0.8	1	0.7	
Type of delivery					
Spontaneous vaginal birth	103	85.1	107	79.3	<0.001
Vaginal breech delivery	4	3.3	10	7.4	
Forceps and vacuum delivery	7	5.8	5	3.7	
Cesarean delivery	7	5.8	13	9.6	
Birth spacing (years)					
<3	119	98.3	105	77.8	<0.001
≥3	2	1.7	30	22.2	
Parity					
1-3	43	35.5	101	74.8	
4-7	70	57.9	34	25.2	
>7	8	6.6	0	0.0	0.001
Onset of POP in relation to order of childbirth and menopause					
After 1st delivery	50	41.3			
2nd-3rd Delivery	41	33.9			
After 4th delivery	17	14.0			
After menopause	13	10.7			
Baby weight (Kg)					
<3.5	43	35.5	112	83.0	0.001
≥3.5	78	64.5	23	17.0	
Resumed work after delivery (days)					
<15	100	82.6	28	20.7	<0.001
15 or more	21	17.4	107	79.3	
Labor pain (hours)					
<24	64	52.9	119	88.1	0.001
≥24	57	47.1	16	11.9	
Place of delivery					
Home	105	86.7	82	60.7	<0.001
Hospital	16	13.1	53	39.2	
Birth attended by skilled birth attendants					
Unattended	89	73.6	59	43.7	0.001
Attended by medical person at home	16	13.2	53	39.3	
Hospital	16	13.2	23	17.0	

Spontaneous vaginal delivery, home delivery, unattended births, early resumption of work, prolonged labor, and higher baby birth weight were significantly more common in Group I. In contrast, Group II more often had later age at first childbirth, adequate birth spacing, lower parity, hospital deliveries, and skilled birth attendance. (Table 2)

Most women in both groups had a BMI <30, with 89.3% of cases and 88.9% of controls. There was no statistically significant difference between the groups. (p = 0.001). (Table 3)

Table 3: Non-Obstetrical risk factors of pelvic organ prolapse.

Parameter	Group I (n=121)		Group II (n=135)		p value
	N	%	n	%	
Prolapse in relation to BMI					
<30	108	89.3	120	88.9	0.001
≥30	13	10.7	15	11.1	

In group I 49% of cases were active smokers and 51% were passive smokers and in group II majority of them were non-smokers. This finding was significant as 49% of women were active smokers in group I. (Figure 1)

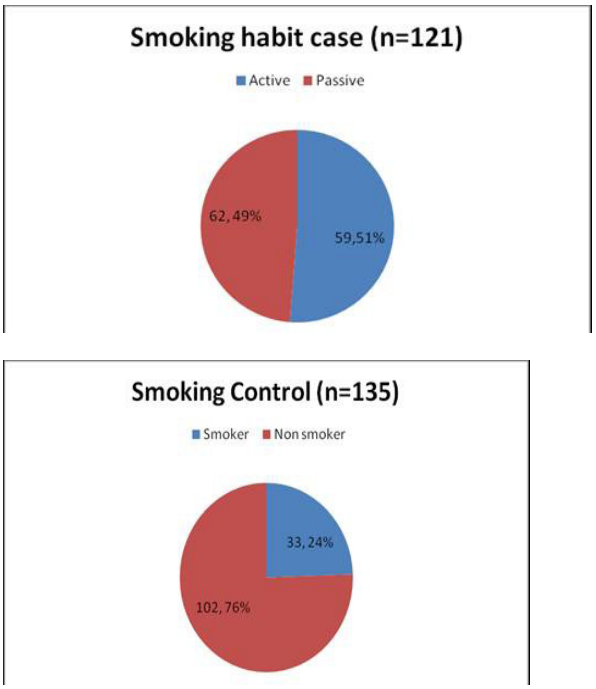

Figure 1: Smoking habit.

The most common symptom was something coming out per vagina, reported by 98.3% of patients. This was followed by heaviness in the vagina in 96.7% (n=117) and feeling of a lump at the introitus in 95.9% of cases. Backache or dragging sensation was reported by 59%, while bleeding or discharge per vagina was noted in 19%. Chronic cough or respiratory infections were present in 56.2% of patients. Among urinary symptoms, urinary incontinence affected 35.5%, burning and frequency of micturition 23.1%, and difficulty in passing urine 14.9%. (Table 4)

The majority of patients had a long duration of illness 10-20 years which was 35.2%. About 24.8% suffered from POP for more than 20 years. Duration of illness of 5-10 years was noted for 23% of cases and this was relatively shorter for 16.5% who are presented within 5 years of illness. (Figure 2)

Table 4: Presenting Symptoms of patients.

Symptoms	Case (n=121)	
	N	%
Something coming out PV	119	98.3
Heaviness in vagina	117	96.7
Feeling of lump at introitus	116	95.9
Backache/dragging sensation	72	59.5
Chronic cough/respiratory infection	68	56.2
Painful intercourse	46	38.0
Urinary incontinence	43	35.5
Difficult to void urine	42	34.7
Burning and frequency of micturition	28	23.1
Bleeding PV/discharge	23	19.0
Inability to pass urine suddenly	18	14.9

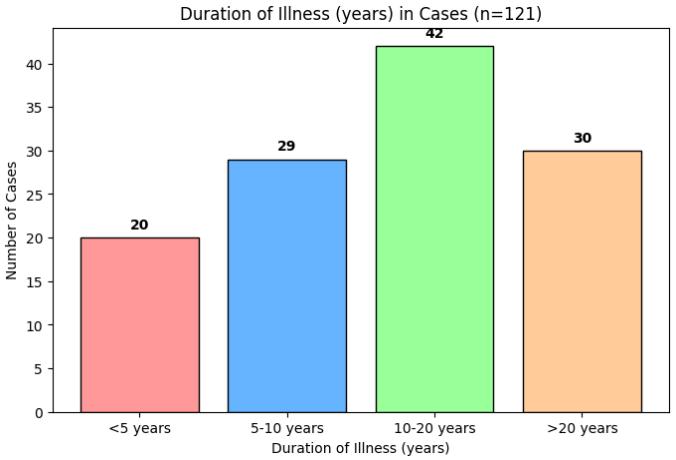

Figure 2: Duration of illness.

Majority of POP cases had prolapsed of all compartments i.e., 43.8%. The percentage of women presenting with anterior, posterior and middle compartment prolapse were 33%, 4.13% and 15% respectively. Only 3.31% of POP cases had enterocele. Comparing different stages of prolapse i.e., anterior, posterior, middle and all compartments prolapse, majority of the patients presented at stage III prolapse, 54.55%, 23.14% at stage IV, 16.53% stage II and Only 5.79% patients presented at early stage (stage I). Across all stages, combined prolapse was more frequently observed, particularly in Stage III and Stage IV prolapse. However, when the distribution of prolapse type was compared across different stages, no statistically significant association was found between the stage of prolapse and the type of prolapse (p = 0.616). (Table 5)

Table 5: Grading of pelvic organ prolapse.

Stage	Anterior only		Posterior only		Middle only		Enterocele		Combined all		Total	%	p value
	n	%	N	%	N	%	n	%	N	%			
I	2	1.65	0	0.00	1	0.83	1	0.83	3	2.48	7	5.79	0.616
II	8	6.61	2	1.65	4	3.31	0	0.00	6	4.96	20	16.53	
III	21	17.36	1	0.83	10	8.26	3	2.48	31	25.62	66	54.55	
IV	9	7.44	2	1.65	4	3.31	0	0.00	13	10.74	28	23.14	
Total	40	33.06	5	4.13	19	15.70	4	3.31	53	43.80	121	100.00	

Discussion

The prevalence of pelvic organ prolapse was found to be 17.82% among the age group 40-60 years but it was 3.09% of total 7117 gynecological cases who attended GOPD during that period. A hospital-based study from maternity hospital, Thapathali, in 1997, reported that prevalence of POP was 9.6% among one thousand one hundred and forty-seven patients attending gynecological clinic.[11] Another community-based study, the CAED study reported the average prevalence of uterine prolapse in Siraha and Saptari district was 37%.[12] According to various studies, the prevalence of prolapse ranged from 7% and up to 51.6%. in Nepal.[13] The prevalence of prolapse shown in various studies is comparable with the prevalence of POP found in this present study. However, there are limited hospital and epidemiological studies to compare our findings. In contrast when compared other different community based and camp-based studies, prevalence is quite comparable as most of these studies were done in various regions of Nepal, variations of finding could be due to number of cases enrolled in the study and number of women who visited in that type of health camps.[14]

In our study 37.2% of women with POP were from others ethnicity category (janajati and Dalits), 28.1% were Chhetri, 19% Brahmins, and Newar 15.7%. This finding is quite contrast to findings of a study conducted in western Nepal by UNFPA (2002) where 90% of women were Brahmin and Chhetri, relatively advantaged and better-informed ethnic group in Nepal compared to janajatis and Dalits who are socially more excluded and disadvantaged group. Similarly, a rural development project response on uterine prolapse conducted in year 2005 and 2008 reported that among women enrolled,60% were Brahmins, Chhetri and Newars, 28.7% Janajatis, and 11 % Dalits.[15] A study of Iwamura hospital showed that majority of women with uterine prolapse were of Newari origin 84%.[16] While observing racial variations in developed countries reported by Steven E. Swift in South Carolina, 52% women with POP were Black and 47% were white and 1% was other racial background Steven, Hendrix et al, in his study compared the incidence of POP with the American and African women which showed that white women had higher risk of POP as compared to American Indian women.[4,17] Asian women had the higher risk of cystocele and rectocele and no uterine prolapse.[4]

In study group were illiterate in both study and control group (86.8% and 79.4% respectively) though relatively more in prolapse group. ARROW study reported 77.27% women with POP were illiterate, and only 10% women had completed their primary school level. In other hand community based large morbidity study reported that literacy level in rural Nepali women of different eight district of Hills, Terai, Mountain, 32.4% in Saptari district were illiterate with highest among 8 districts and lowest illiteracy level in Bajhang.[18] Likewise in current study, majority of women were farmers, housewives and laborers 44.6%, 35.6% and 19.0% respectively versus 35.6%, 28.9% and16% in control group. In a study by Darsan A, et al, majority of women (48.48%) with POP were farmers whereas 18.19% of them were wage laborers together with farming.[19] In Nepal, women typically work 11 to 16 hours a day, combining hard home and agricultural labor, which often continues into pregnancy and the early postpartum period. Pelvic organs prolapse is more likely in women who work hard and return to work soon after giving birth, according to published research.

In the current study, 81.0% of women with POP and 33.3% of women without POP gave birth for the first time between the ages of 15 and 20. This result is in line with other research (CAED, 2006; Subba et al., 2003; IOM/UNFPA, 2006; Darshan et al., 2009) that found a high frequency of POP among women whose first pregnancy and childbirth happened during adolescent (<19 years).[7, 20,8] Early pregnancy combined with heavy physical work, poor nutrition, limited skilled care, and inadequate postpartum rest substantially contributes to the development of POP.[21] The finding in the present study is consistent with other studies in this country.8 Multiparity is often attributed as one of the risk factors for developing prolapse. Around 57.9% of patients with POP had parity four or more in present study. In the clinical review by Anjum Doshani, it was mentioned that increasing parity was associated with increasing incidence and severity of prolapse.[22] Similarly, Oxford family planning epidemiological study also supported parity as the strongest risk factors for the pelvic organ prolapse and those with history of two vaginal deliveries were 8.4 times more likely to have surgery for prolapse than those with no such history.[23]

In the study done by Catherine et al, elderly parous women are more likely to have progressive pelvic organ prolapse.[24] In context of Nepal, various studies have supported parity as risk factor for prolapse. The Arrow study showed that maximum number of women (37.9%) had prolapse after having more than four children but about 27.27% had prolapse after birth of only one child. Moreover 85% of prolapse occurred in cases among women who had given birth for more than three times. This study also showed that 6.07% of women were pregnant between10-13 times.[8] In a

research conducted in a camp, Padam R. Pant et al. found that 68% of women with uterine prolapse had complete procidentia, and their parity ranged from two to thirteen.[9] Similarly, Geeta Gurung et al reported that was among prolapse case 5.1%, 9.2%,10.1% and 18% were para one, para two, para three and more than para four respectively.[18] Only 1.9% of women with genital prolapse were nulliparous in this study. Similar findings were reported by Messerschmidt L, that among the women who visited the health camps, forty percent had one child while twenty-two percent had two children.[15] Increasing parity was associated with increased incidence of POP was consistent with other studies.[9]

In the present study, 41.3%, 33.9%, 14.0% had prolapse after their first, second and third childbirth respectively, and only 10.7% had prolapse developed after menopause. CAED study that large number of women had given birth one or more than five even after prolapse. Madhusudan Subedi reported that 30.4% had prolapse after first child birth, 44.9% noted after 2nd child birth and the mean age of women developing prolapse was 27.91 years.[13] According to Bonette et al, onset of prolapse after first pregnancy was 18.3% and 2.3% were nulliparous.[6] Similarly, many studies have shown that prolapse was present right after first child birth.[8] Many research findings showed that uterine prolapse can result from prolonged labor, too early or too closely spaced pregnancies which is quite similar to this present study.[13]

Clinical evaluations have shown macrosomia as a major risk factor, along with extended labor and obstetric procedures.[22] Given that women with POP gave birth to larger kids than controls, this association is further supported by the current study. Furthermore, 82.6% of women resumed intensive home and agricultural work within 15 days of giving birth. Inadequate postpartum rest is a significant cause of POP, according to similar results from other Nepalese studies.[25,13] The majority of the women in this study had symptoms that lasted five to twenty years, including vaginal heaviness, a lump or something coming out of the vagina, trouble voiding, backache, urine incontinence, dyspareunia, persistent cough, and bleeding from ulcers. The Institute of Medicine and other hospital- and community based investigations have shown similar complaints, such as lower abdomen pain, backache, discharge, dyspareunia, frequent micturition, and persistent constipation.[8] The sensation of something coming out of the vagina was more common in earlier studies that covered a larger age range (23-80 years) and more younger individuals, which may explain variations in symptom patterns. The majority of POP patients in the current investigation had an illness duration of 10-20 years, which is in line with results published by Bonetti et al.[6]

About 89.3% of women with POP in the current study had a BMI of less than 30, whereas only 10.7% had a BMI of more than 30. Both groups' BMI distributions were identical. Although overweight and obesity have been identified as important risk factors for prolapse in earlier research, BMI did not seem to play a significant role in this study.[22] This could be because the majority of participants were from hilly areas where heavy physical labor was a more significant risk factor than obesity. Women with pelvic organ prolapse were active smokers over past several years 49% in contrast to 76% in control group and 51% were passive smokers in study group they were not directly smoked but they were exposed to smoke during cooking on firewood or their husbands and family members were smokers. In Oxford Family Planning Association Jonathan study, showed that a contradictory findings history of conditions suggestive of deficient connective tissues (varicose veins, hernia, hemorrhoids) was associated significantly with symptomatic prolapse. Current or previous smoking status was not associated with symptomatic prolapse, nor was the number of cigarettes smoked. [23]

In current study 54.55% of women ad stage III prolapse, 23% had stage IV, 16.53% had stage II, and 5.79% had stage I, according to POP staging using the standard and simplified POP-Q approach. In addition, 25.6% developed urinary incontinence and 39% had vaginal atrophic alterations. In research from Seoul, Korea, showed a similar pattern, with stage III accounting for 55% of cases, followed by stage II (25%) and stage IV (20%).[26] Most of the studies conducted in Nepal were prolapse quantified by other traditional methods except this study so could not compare these findings. In study done in IMHARC and at free health camps in this area, 83% patients were diagnosed with third-degree prolapse, while 17% patients had second degree prolapse.[27] In Geeta Gurung at al study 37.3% had first degree, 12.6% second degree prolapse and 16.8% had third degree prolapse.[18] In IOM study, 28% women had first degree, 24% had second degree and 47% had third degree prolapse.[8] POP-Q method to ascertain degree of prolapse is yet not widely used in Nepal, leading to difficulties in comparing staging of prolapse.

There are a number of limitations to this study. The results may not be entirely representative of the community because the study was conducted on a small sample over a brief period of time and was hospital based, encompassing women between the ages of 40 and 60 years. Thorough assessment was limited because not all obstetric and non-obstetric risk variables could be evaluated. Because participants were asked to report past experiences with pregnancy, labor, nutrition, postpartum rest, and returning to work, recall bias may have occurred.

Conclusion

Pelvic organ prolapse remains a significant public health issue. Targeted interventions including delaying early childbirth, promoting institutional delivery, and improving postpartum care are recommended.

Conflict of Interest: None

AUTHOR'S CONTRIBUTION AND ORCID IDS

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