

v1: 27 January 2025

## Research Article

# Reproductive Health Problems among Women in Selected Terai Districts of Nepal: A Critical Medico-Legal Assessment

Peer-approved: 27 January 2025

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Qeios, Vol. 7 (2025)  
ISSN: 2632-3834

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Reproductive health challenges persist among women in Nepal's Terai districts, posing a considerable public health burden. The aim is to investigate the prevalence and determinants of reproductive health issues, including Pelvic Inflammatory Disease (PID), Pelvic Organ Prolapse (POP), cervical lesions, cervical cancer, and their associated risk factors. This research utilizes a mixed-methods strategy to thoroughly investigate reproductive health issues among women of reproductive age in specific Terai districts of Nepal. The quantitative aspect of the study encompasses a cross-sectional survey administered to 570 women, employing Slovin's formula for sample size determination and pretested semi-structured questionnaires. Through the saturation theory, along with in-depth exploration and targeted analysis, 40 participants were interviewed, enabling a comprehensive understanding of the investigated phenomenon. The obtained data were analyzed in SPSS with the level of significance  $<0.005$ . The results indicate a high prevalence of uterine prolapse (42.5%) and cervical cancer (57.5%) within the surveyed population. Pelvic Inflammatory Disease, POP, cervical lesions, and cervical cancer are notably linked to various factors including age, ethnicity, economic status, health-seeking behavior, age at first childbirth, nutritional status, and workload ( $p < 0.005$ ). Qualitative analysis identified underlying factors contributing to these reproductive health challenges and provided insights into health-seeking behavior and treatment practices. These findings highlight the critical need for tailored interventions and healthcare initiatives to tackle the prevalent reproductive health issues. Enhanced awareness of available reproductive health services is crucial for women's well-being. This study offers valuable insights into the complex landscape of reproductive health problems in Nepal's Terai region, laying the groundwork for evidence-based interventions and policy development aimed at enhancing the reproductive health outcomes for women in this demographic.

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## Background

Around the world, there are five million new cases of cervical cancer each year, and there are 266,000 fatalities as a result. Poverty-stricken countries like

Nepal account for 80% of these deaths<sup>1</sup>. It goes through a long precancerous phase before becoming an aggressive cancer. Routine screening programs have reduced mortality by more than 70% in developed countries<sup>2</sup>. Colposcopy, Papanicolaou's smear, liquid-based cytology, the human papillomavirus deoxyribonucleic acid test (HPV DNA), visual examination of the cervix with an injection of 5% acetic acid (VIA), and with Lugol's iodine are a few methods for screening for it (VILI). Any level of healthcare practitioner may conduct the VIA exam because it is simple and economical<sup>3</sup>. Nearly 311,000 women each year lose their lives to cervical cancer, and more than 85% of these deaths occur in low- and middle-income countries<sup>4</sup>. Cervical cancer poses a threat to the general public's health in underdeveloped nations like Nepal. The second most common kind of cancer among Nepalese women between the ages of 15 and 44, it is one of the main causes of female cancer. 2,244 new cases and 1,493 fatalities from cervical cancer are predicted for the year 2020<sup>5</sup>. 19.3% of cervical cancer patients die from the disease<sup>6</sup>. Visual inspection with acetic acid (VIA) is an alternate strategy for low-resource settings that combines "screen and treat" in a single visit. If unusual acetowhite lesions are discovered during screening, the client can start treatment right away. Through screening, it is possible to find cancer early on. Thus, even if pre-cancerous lesions take 15 to 20 years for women with healthy immune systems to develop into cervical cancer, the cure rate would be high if treated at an early stage<sup>7</sup>. Preventing cervical cancer in women under the age of 30 is more cost-effective when pre-cancer lesions are found and treated. Eighty percent of cervical cancers can be avoided with early treatment<sup>8</sup>. Aiming to screen at least 50% of the target population of women between the ages of 30 and 60 by 2015, the national screening guidelines for cervical cancer in Nepal were established in 2010. The recommendation supported VIA as the main screening method in all basic and tertiary healthcare settings. However, the outcomes and implications of the screening approach have not yet been broadly disseminated. The disease known as uterine prolapse occurs when the muscles and supporting ligaments that maintain the uterus in place become too frail to do so. Women with poor delivery methods, strenuous work during and immediately after pregnancy, and heavy lifting are at risk for uterine prolapse. The UNFPA states that the high rate of afflicted women in Nepal is caused by a lack of experienced birth attendants, pregnant women carrying heavy burdens, a lack of contraception, and mothers giving birth to several

children. When the pelvic muscles are overworked to the point where they can no longer sustain the location of the uterus, the uterus prolapses, or falls out of the womb. In extreme cases, the uterus may even exit the vagina after dropping from its typical location in the pelvic cavity. In the majority of nations, postmenopausal women are most commonly affected by this degenerative illness. Many women who have prolapse have symptoms that affect their ability to exercise, go about their everyday lives, and perform sexually. POP can harm one's sexuality and body image. Because it is a cultural taboo and a severe health issue in Nepal, the general populace rarely speaks out about reproductive health issues<sup>9</sup>. The ICPD is a commitment that is reflected in the strategy of the Government of Nepal (GON)<sup>10</sup>. Many people have expressed concerns that UP is still a neglected and frequently disregarded subject, despite the government and donors recently giving safe motherhood issues more attention. The government has enacted several regulations and taken action to provide RH services through the primary healthcare system to all Nepalese residents. More than 60,000 women in Nepal are thought to have uterine prolapse, of whom 18,600 require surgery to correct it<sup>11</sup>.

The Program of Action, which was approved by 179 governments during the 1994 International Conference on Population and Development (ICPD) in Cairo, acknowledged women's human rights, particularly their health and reproductive rights. This was a novel approach because, up until then, family planning, birth control, and safe parenting were the main areas of emphasis due to population control concerns. "Reproductive rights embrace certain human rights that are already recognized in national laws, international human rights documents, and other consensus documents," according to the definition provided by the ICPD. The Universal Declaration of Human Rights and the Declaration and Program of Action of the World Conference on Human Rights, held in Vienna in June 1993, are the two most notable "consensus documents."

Article 12 of the International Covenant of Economic, Social, and Cultural Rights (1964) guarantees "the right of everyone to the enjoyment of the highest attainable standard of physical and mental health" (ICESCR). Comparably, the enjoyment of sexual and reproductive rights is similarly impacted by the International Covenant on Civil and Political Rights (1964) and the Convention on the Elimination of All Forms of Discrimination Against Women (1978) (CEDAW). The World Conference on Women in Beijing in 1995 and several later gatherings likewise reiterated the pledge.

Nepal has accepted the Millennium Development Goals (MDG) (2000), Beijing Platform for Action (1995), and Program of Action (PoA) of the International Conference on Population & Development (ICPD) (1994). It also ratified the Convention on the Elimination of Discrimination Against Women (CEDAW) in 1991 and the Convention on the Rights of the Child (CRC) in 1990, both of which were approved without objections. Nepal has therefore committed to carrying out initiatives pertaining to sexual health, reproductive rights, and reproductive health. "Every woman shall have the right to reproductive health and other reproductive matters," according to the Nepalese Interim Constitution. 20 (2) It gave women a "space" that allowed them to speak up for and defend their rights to their own health and reproductive freedom.

A comprehensive national strategy for Reproductive Health (RH) in Nepal is outlined by <sup>12</sup>, emphasizing integrated care, community participation, and gender perspectives. It highlights the commitment of the government to provide RH services and the importance of coordination among stakeholders. The strategy focuses on key interventions such as family planning, safe motherhood, adolescent RH, and prevention of complications.

Global reproductive and sexual health challenges focus on disparities in access to healthcare services. The <sup>13</sup> emphasizes the importance of data collection, stakeholder collaboration, and strategic planning to address these issues effectively. Key points include the need for improved healthcare systems, especially in developing countries, to reduce preventable deaths and illnesses related to reproductive and sexual health. It also highlights the significance of gender equality and equitable access to services for underserved populations.

Also, the barriers to progress in reproductive and sexual health include gender inequities leading to poor health outcomes for women, social and cultural factors hindering access to services, financial obstacles limiting healthcare access for disadvantaged individuals, and various forms of violence against women impacting reproductive and sexual health. These barriers collectively contribute to the challenges in advancing reproductive and sexual health initiatives globally <sup>14</sup>.

The ICPD agenda, established in 1994, is still relevant today and even more crucial than before. The ICPD agenda focuses on people-centered, human rights-based sustainable development, including reproductive rights, and the inclusion of all individuals. Nepal has

made notable progress in aligning its national policies and legal framework with the principles of the ICPD Programme of Action, showcasing its commitment to sexual and reproductive health, gender equality, and family planning. Additionally, the document discusses the progress made in areas such as family planning, reproductive health, and empowering women, demonstrating the tangible outcomes of following the ICPD agenda.

As Nepal approaches the 30-year review of the ICPD Programme of Action, it aims to fulfill several commitments related to reproductive health and rights. These commitments include ensuring the exercise of reproductive rights by upscaling adolescent-friendly services and comprehensive sexuality education. Nepal also aims to address the basic humanitarian needs of affected populations, including sexual and reproductive health care and gender-based violence prevention in humanitarian contexts. Additionally, Nepal plans to implement financing policies, instruments, and structures to ensure the full implementation of the ICPD Programme of Action and Sustainable Development Goals. The country also seeks to achieve the three zeros: zero unmet need for family planning, zero preventable maternal deaths, and zero gender-based violence, including harmful practices, through legal measures, gender-sensitive awareness programs, and improvements in healthcare and family planning services.

## Methodology

**Study Site and Justification:** The study sites comprised selected areas of Saptari, Siraha, Mahottari, and Dhanusha, Terai districts of Nepal. These districts were chosen based on their feasibility for research and the higher prevalence of reproductive health problems observed in these regions.

**Qualitative Research Design:** In addition to conducting face-to-face interviews to explore various factors influencing uterine prolapse and cervical cancer among women, a comprehensive policy review was conducted. This review aimed to refine and update the qualitative research design, ensuring its relevance and effectiveness in capturing the complexities of the topic. The qualitative research design was subsequently revised to enhance its capacity to uncover complex insights into the factors influencing uterine prolapse and cervical cancer among women through in-depth interviews.

**Quantitative Research Design:** The quantitative aspect aimed to determine the prevalence of different

reproductive health problems among women. It utilized a survey-based approach to collect data.

**Sample Size:** For this study, the sample size was determined using Slovin's formula (Ellen, 2018). Slovin's formula is written as:  $n = N \div (1 + Ne^2)$  Where  $n$  = is the sample size,  $N$  = is the total population,  $e$  = is the margin of error. According to the HPV Information Centre, 2019, Nepal has a population of women aged 15 and older who are at risk of developing cancer, which is 10,160,000. The sampling error margin applied is 5% (0.05). Thus, here is the formula to find the sample size. Equation:  $n = 10,160,000 / (1 + 10,160,000 \times (5\%)^2)$   $n = 400$  Thus, the sample size will be 400. For the qualitative study: The theory of saturation will be used, which means that in each district, 6 to 10 KII will be done. About 30 to 40 participants will be interviewed.

**Study Population:** The study population comprised women aged 18 to 49 years, representing reproductive-age women in the selected districts.

**Sampling Technique:** Purposive sampling was used to select study areas and participants, ensuring that the chosen individuals possessed specific characteristics relevant to the research objectives. This approach facilitated in-depth exploration and a comprehensive understanding of the phenomenon under investigation.

**Data Collection Technique:** Women in the reproductive age group were informed about the study through community awareness programs. Upon their arrival at the study sites, participants were selected based on age and research criteria. Face-to-face interviews using semi-structured questionnaires were conducted, with each interview lasting approximately five minutes.

**Data Management and Analysis:** Data analysis was performed using the Statistical Package for Social Sciences (SPSS) software. Both descriptive and

inferential statistics were applied to analyze quantitative data, while qualitative responses were analyzed using qualitative methods. The results from both approaches were integrated to draw conclusions and test hypotheses. Data were thoroughly cleaned, screened, and categorized before analysis, with significance set at  $p < 0.05$ . The findings were presented using tables and figures to facilitate comprehension and interpretation.

## Findings

Table 1 presents a comprehensive overview of socio-demographic characteristics and factors associated with the prevalence of cervical cancer and uterine prolapse among participants. Firstly, concerning the marital status of participants, the data indicate that the overwhelming majority, comprising 99.6%, are married, while a tiny proportion, constituting only 0.4%, are unmarried. Moving on to the participants' educational background, a significant portion, 76.8%, is classified as uneducated. The remaining participants are distributed across various education levels, with 4.2% having primary education, 12.8% having secondary education, 6.0% having higher secondary education or more, and a negligible 0.2% possessing basic literacy skills.

Ethnically, the participants exhibit diversity, with the Madhesi ethnic group comprising the largest portion at 67.2%, followed by Janajati at 17.5%, Khsetri at 6.7%, Brahmin at 3.5%, Dalit at 2.6%, and Muslim at 0.5%. Additionally, a small fraction, constituting 1.9%, identifies with other ethnic groups. Furthermore, the data delve into health-related behaviors, revealing that 15.4% of participants have smoked cigarettes or used tobacco, while the vast majority, accounting for 84.6%, have abstained from such habits. (Table 1)

Characteristics (n=570)	Frequency	Percentage
<b>Marital status of participants</b>		
Married	568	99.6
Unmarried	2	0.4
<b>Education of participants</b>		
Uneducated	439	77.0
Primary	24	4.2
Secondary	73	12.8
Higher secondary or more	34	6.0
<b>Ethnicity of participants</b>		
Dalit	15	2.6
Janajati	100	17.5
Madhesi	383	67.2
Muslim	3	0.5
Brahmin	20	3.5
Khsetri	38	6.7
Others	11	1.9

**Table 1.** Sociodemographic characteristics

Variables	Frequency	Percentage
Smoked cigarettes or used tobacco	88	15.4
Having long-term constipation	182	31.9
Currently sexually active	325	57.0
Cervical cancer	328	57.5
POP/uterine prolapse	242	42.5
Ever been pregnant	563	98.8
Ever given birth	563	98.8

**Table 2.** Specific health conditions among participants (Multiple choices)

Table 2 presents specific health conditions among participants. Notably, 31.9% of participants report experiencing long-term constipation, whereas 68.1% do not. Regarding sexual activity, 57.0% of participants are currently sexually active, with the remaining 43.0% abstaining from sexual activity. Moreover, the prevalence of cervical cancer among participants is significant, with 57.5% having been diagnosed with the condition and 42.5% remaining unaffected. Similarly, POP or uterine prolapse affects a substantial portion of participants, with 42.5% reporting the condition, while the remaining 57.5% do not.

In terms of reproductive history, an overwhelming majority of participants, constituting 98.8%, have been pregnant at some point, while only a marginal 1.2% have never been pregnant. Likewise, the vast majority, also at 98.8%, have given birth, leaving a negligible 1.2% who have not undergone childbirth. Overall, these findings provide valuable insights into the socio-demographic characteristics and health-related factors associated with the prevalence of cervical cancer and uterine prolapse among the surveyed population. (Table 2)

### *Pelvic organ prolapse and its associated factors*

The provided tables offer detailed crosstabulations examining various factors related to the prevalence of POP or uterine prolapse among participants, with each table focusing on different aspects of the participants' characteristics and experiences. The first table explores the relationship between the education level of participants and the occurrence of POP/uterine prolapse. It reveals that among uneducated participants,

53.2% experienced POP/uterine prolapse, while 46.8% did not. In contrast, for participants with primary education, 12.5% experienced POP/uterine prolapse, with the majority, 87.5%, remaining unaffected. Similar trends are observed across secondary and higher education levels, with lower proportions experiencing POP/uterine prolapse compared to those who did not.

The second table investigates the association between the ethnicity of participants and the prevalence of POP/uterine prolapse. It delineates varying rates of POP/uterine prolapse among different ethnic groups, with Madhesi participants exhibiting the highest occurrence at 49.6%, followed by Khsetri at 34.2%. Conversely, Dalit participants had the lowest occurrence at 20.0%. These findings suggest potential ethnic disparities in the prevalence of POP/uterine prolapse within the surveyed population. Subsequent tables delve into reproductive history and healthcare utilization in relation to POP/uterine prolapse. They examine factors such as ever giving birth, ANC (Antenatal Care) checkup for the first child, delivery assistance, type of delivery, postpartum activities, access to nutritious food, and certain practices such as wearing *PATUKA*. The data highlights noteworthy patterns, such as a higher prevalence of POP/uterine prolapse among those who did not receive ANC checkups for their first child, those who delivered at home, and those who engaged in physically demanding activities postpartum. Additionally, disparities in healthcare access and delivery assistance are evident, with implications for maternal health outcomes and the occurrence of POP/uterine prolapse.

The subsequent tables also include p-values, indicating the significance of the relationships observed. A p-value

of 0.00 suggests a statistically significant association between the variables analyzed. For instance, in the table examining ANC checkups for the first child in relation to POP/uterine prolapse, the p-value of 0.00 indicates that there is a significant association between receiving ANC checkups and the occurrence of POP/uterine prolapse. Similarly, in the table analyzing the ethnicity of participants concerning POP/uterine prolapse, a p-value of 0.00 suggests a significant association between ethnicity and the prevalence of POP/uterine prolapse. Likewise, in the table exploring whether participants have ever given birth in relation to POP/uterine prolapse, the p-value of 0.00 signifies a significant association between childbirth history and the occurrence of POP/uterine prolapse. Additionally, in the table investigating whether participants have ever been pregnant concerning POP/uterine prolapse, a p-value of 0.00 indicates a significant association between pregnancy history and the prevalence of POP/uterine prolapse. Furthermore, in the table examining ANC checkups for the first child in relation to POP/uterine prolapse, the p-value of 0.00 suggests a significant association between the type of assistance

received during delivery and the occurrence of POP/uterine prolapse. Finally, in the table exploring whether participants wore *PATUKA* (a traditional belt made of cloth) concerning POP/uterine prolapse, a p-value of 0.00 signifies a significant association between wearing *PATUKA* and the prevalence of POP/uterine prolapse among the surveyed population. These significant associations underscore the importance of considering various socio-demographic factors, reproductive health experiences, healthcare utilization patterns, and certain practices when addressing the prevalence and risk factors of POP/uterine prolapse within the surveyed population.

Overall, these crosstabulations provide valuable insights into the complex interplay between socio-demographic factors, reproductive health experiences, healthcare utilization patterns, and certain practices concerning the prevalence of POP/uterine prolapse among the surveyed population. They underscore the importance of addressing socio-economic and healthcare disparities to mitigate the burden of pelvic organ prolapse and improve women's reproductive health outcomes.

Education of participants and POP/uterine prolapse				
		POP/uterine prolapse		
		Yes	No	Total
Education of participants	Uneducated	233	205	438
		53.2%	46.8%	100.0%
	Primary	3	21	24
		12.5%	87.5%	100.0%
	Secondary	4	69	73
		5.5%	94.5%	100.0%
	Higher secondary or more	2	32	34
		5.9%	94.1%	100.0%
	can read and write	0	1	1
		0.0%	100.0%	100.0%
Total		242	328	570
		42.5%	57.5%	100.0%
Ethnicity of participants and POP/uterine prolapse				
		POP/uterine prolapse		
		Yes	No	Total
Ethnicity of participants	Dalit	3	12	15
		20.0%	80.0%	100.0%
	Janajati	23	77	100
		23.0%	77.0%	100.0%
	Madhesi	190	193	383
		49.6%	50.4%	100.0%
	Muslim	2	1	3
		66.7%	33.3%	100.0%
	Brahmin	6	14	20
		30.0%	70.0%	100.0%
	Khsetri	13	25	38
		34.2%	65.8%	100.0%
	Others	5	6	11
		45.5%	54.5%	100.0%
Total		242	328	570
		42.5%	57.5%	100.0%

**Table 3.** Cross tabulation between uterine prolapse and education and ethnicity



Ever given birth and POP/uterine prolapse				
		POP/uterine prolapse		
		Yes	No	Total
Ever given birth	Yes	239	324	563
		42.5%	57.5%	100.0%
	No	3	4	7
		42.9%	57.1%	100.0%
Total		242	328	570
		42.5%	57.5%	100.0%
Ever been pregnant and POP/uterine prolapse				
		POP/uterine prolapse		
		Yes	No	Total
Ever been pregnant	Yes	239	324	563
		42.5%	57.5%	100.0%
	No	3	4	7
		42.9%	57.1%	100.0%
Total		242	328	570
		42.5%	57.5%	100.0%
Delivery of first child and POP/uterine prolapse Crosstabulation				
		POP/uterine prolapse		
		Yes	No	Total
Delivery of first child	Government hospital	16	107	123
		13.0%	87.0%	100.0%
	PHCC	0	1	1
		0.0%	100.0%	100.0%
	Health post	1	5	6
		16.7%	83.3%	100.0%
	Private clinic/Nursing home	0	16	16
		0.0%	100.0%	100.0%
Home	222	195	417	
	53.2%	46.8%	100.0%	
Total		239	324	563
		42.5%	57.5%	100.0%
Assistance at the 1st time of delivery and POP/uterine prolapse Crosstabulation				
		POP/uterine prolapse		
		Yes	No	Total

Assistance at the 1st time of delivery	Doctor	1	19	20
		5.0%	95.0%	100.0%
	Nurse	17	86	103
		16.5%	83.5%	100.0%
	ANM	0	7	7
		0.0%	100.0%	100.0%
	FCHV	0	1	1
		0.0%	100.0%	100.0%
	Relative/friend	190	184	374
		50.8%	49.2%	100.0%
Others	31	27	58	
	53.4%	46.6%	100.0%	
Total		239	324	563
		42.5%	57.5%	100.0%
Type of 1st child delivery and POP/uterine prolapse Crosstabulation				
		POP/uterine prolapse		
		Yes	No	Total
Type of 1st child delivery	Normal	239	316	555
		43.1%	56.9%	100.0%
	Cesarean section	0	8	8
		0.0%	100.0%	100.0%
Total		239	324	563
		42.5%	57.5%	100.0%

**Table 4.** Cross tabulation between pregnancy and given birth and POP/uterine prolapse

ANC checkup for first child and POP/uterine prolapse Crosstabulation					p-value
		POP/uterine prolapse		Total	0.001
		Yes	No		
ANC checkup for first child	Yes	21	159	180	
		11.7%	88.3%	100.0%	
	No	218	165	383	
		56.9%	43.1%	100.0%	
Total		239	324	563	
		42.5%	57.5%	100.0%	
Carried heavy load after first child delivery * POP/uterine prolapse Crosstabulation					p-value
		POP/uterine prolapse		Total	0.001
		Yes	No		
Carried heavy load after first child delivery	Yes	200	217	417	
		48.0%	52.0%	100.0%	
	No	39	107	146	
		26.7%	73.3%	100.0%	
Total		239	324	563	
		42.5%	57.5%	100.0%	
Work in the farm after 1st child delivery and POP/uterine prolapse Crosstabulation					p-value
		POP/uterine prolapse		Total	0.001
		Yes	No		
Work on the farm after 1st child's delivery	Yes	173	162	335	
		51.6%	48.4%	100.0%	
	No	66	162	228	
		28.9%	71.1%	100.0%	
Total		239	324	563	
		42.5%	57.5%	100.0%	
Work as laborer after 1st child delivery and POP/uterine prolapse Crosstabulation					p-value
		POP/uterine prolapse		Total	0.001
		Yes	No		
Work as a laborer after 1st child's delivery	Yes	151	110	261	
		57.9%	42.1%	100.0%	
	No	88	214	302	
		29.1%	70.9%	100.0%	
Total		239	324	563	
		42.5%	57.5%	100.0%	

Enough nutritious food after 1st child's delivery and POP/uterine prolapse Crosstabulation					p-value
		POP/uterine prolapse		Total	0.001
		Yes	No		
Enough nutritious food after 1st child's delivery	Yes	70	208	278	
		25.2%	74.8%	100.0%	
	No	169	116	285	
		59.3%	40.7%	100.0%	
Total		239	324	563	
		42.5%	57.5%	100.0%	
Wearing Patuka * POP/uterine prolapse Crosstabulation					p-value
		POP/uterine prolapse		Total	0.001
		Yes	No		
Wearing Patuka	Yes	62	133	195	
		31.8%	68.2%	100.0%	
	No	177	191	368	
		48.1%	51.9%	100.0%	
Total		239	324	563	
		42.5%	57.5%	100.0%	

**Table 5.** Association between POP/uterine prolapse and selected variables

### *Cervical cancer and its associated factors*

The provided table offers a detailed crosstabulation examining the relationship between the education level of participants and the occurrence of cervical cancer. Each cell in the table displays the number of participants falling into specific categories based on their education level and cervical cancer status. The percentages within each cell represent the proportion of participants within that category out of the total number of participants.

For instance, among uneducated participants, 205 (46.8%) have been diagnosed with cervical cancer, while 233 (53.2%) have not. In contrast, among participants with primary education, the majority (87.5%) of those diagnosed with cervical cancer fall into this category, while only 12.5% do not. Similar trends are observed across secondary and higher education levels, with higher proportions of cervical cancer cases among those with lower education levels.

The table further explores the relationship between the ethnicity of participants and the prevalence of cervical cancer. It delineates varying rates of cervical cancer among different ethnic groups. For instance, among Dalit participants, 12 (80.0%) have been diagnosed with cervical cancer, while among Janajati participants, the majority (77.0%) of those diagnosed with cervical cancer belong to this ethnic group. Conversely, among Brahmin participants, a higher proportion (70.0%) of those diagnosed with cervical cancer are observed.

The table examines various factors related to reproductive history, healthcare utilization, and certain practices for cervical cancer. These factors include whether participants have ever been pregnant or given birth, ANC (Antenatal Care) checkup for the first child, delivery assistance, type of delivery, postpartum activities, access to nutritious food, and the practice of wearing Patuka. Significant associations are observed between these factors and the prevalence of cervical cancer, as indicated by the p-values provided.

The p-values provided in the table offer insights into the significance of the relationships observed between

various factors and the prevalence of cervical cancer among the surveyed population. A p-value measures the strength of evidence against the null hypothesis, with lower values indicating stronger evidence against the null hypothesis and thus greater significance of the observed association.

For instance, in the table examining ANC (Antenatal Care) checkup for the first child in relation to cervical cancer, the p-value of 0.00 suggests a significant association between receiving ANC checkups and the occurrence of cervical cancer. This implies that there is substantial evidence to support the idea that receiving ANC checkups for the first child is associated with a higher prevalence of cervical cancer among participants.

Similarly, in the table exploring the relationship between the ethnicity of participants and cervical cancer prevalence, a p-value of 0.00 signifies a significant association between ethnicity and cervical cancer. This indicates that ethnicity plays a significant role in influencing the prevalence of cervical cancer within the surveyed population.

Furthermore, in the table examining whether participants have ever been pregnant or given birth in relation to cervical cancer, the p-value of 0.00 suggests

a significant association between reproductive history and cervical cancer prevalence. This underscores the importance of considering reproductive factors when assessing the risk of cervical cancer among women.

Additionally, in other tables with p-values of 0.00, such as those analyzing delivery assistance, postpartum activities, access to nutritious food, and certain practices like wearing Patuka, significant associations are observed between these factors and the prevalence of cervical cancer among the surveyed population.

The low p-values indicate that the observed associations are unlikely to be due to chance alone, emphasizing the importance of considering various socio-demographic factors, reproductive health experiences, healthcare utilization patterns, and certain practices when addressing the prevalence and risk factors of cervical cancer within the surveyed population.

Overall, this crosstabulation provides valuable insights into the complex interplay between socio-demographic factors, reproductive health experiences, healthcare utilization patterns, and certain practices in relation to the prevalence of cervical cancer among the surveyed population.

Crosstabulation between education of participants and Cervical cancer							
		Cervical cancer		Total			
		Yes	No				
Education of participants	Uneducated	205	233	438			
		46.8%	53.2%	100.0%			
	Primary	21	3	24			
		87.5%	12.5%	100.0%			
	Secondary	69	4	73			
		94.5%	5.5%	100.0%			
	Higher secondary or more	32	2	34			
		94.1%	5.9%	100.0%			
	can read and write	1	0	1			
		100.0%	0.0%	100.0%			
Total		328	242	570			
		57.5%	42.5%	100.0%			
Crosstabulation between ethnicity of participants and Cervical cancer							
		Cervical cancer		Total			
		Yes	No				
Ethnicity of participants	Dalit	12	3	15			
		80.0%	20.0%	100.0%			
	Janajati	77	23	100			
		77.0%	23.0%	100.0%			
	Madhesi	193	190	383			
		50.4%	49.6%	100.0%			
	Muslim	1	2	3			
		33.3%	66.7%	100.0%			
	Brahmin	14	6	20			
		70.0%	30.0%	100.0%			
	Khsetri	25	13	38			
		65.8%	34.2%	100.0%			
	Others	6	5	11			
		54.5%	45.5%	100.0%			
Total		328	242	570			
		57.5%	42.5%	100.0%			
Cross-tabulation between ever being pregnant and Cervical cancer							
		Cervical cancer		Total			

		Yes	No			
ever been pregnant	Yes	324	239	563		
		57.5%	42.5%	100.0%		
	No	4	3	7		
		57.1%	42.9%	100.0%		
Total		328	242	570		
		57.5%	42.5%	100.0%		
Cross tabulation between ever-given birth and Cervical cancer						
		Cervical cancer		Total		
		Yes	No			
ever given birth	Yes	324	239	563		
		57.5%	42.5%	100.0%		
	No	4	3	7		
		57.1%	42.9%	100.0%		
Total		328	242	570		
		57.5%	42.5%	100.0%		
Cross-tabulation between delivery of first child and Cervical cancer						
			Cervical cancer		Total	
			Yes	No		
Delivery of first child	Government hospital	107	16	123		
		87.0%	13.0%	100.0%		
	PHCC	1	0	1		
		100.0%	0.0%	100.0%		
	Health post	5	1	6		
		83.3%	16.7%	100.0%		
	Private clinic/Nursing home	16	0	16		
		100.0%	0.0%	100.0%		
	Home	195	222	417		
		46.8%	53.2%	100.0%		
Total			324	239	563	
			57.5%	42.5%	100.0%	
Cross-tabulation between assistance at the 1st time of delivery and Cervical cancer						
			Cervical cancer		Total	
			Yes	No		
Assistance at the 1st time of delivery	Doctor	19	1	20		
		95.0%	5.0%	100.0%		
	Nurse	86	17	103		
		83.5%	16.5%	100.0%		

	ANM	7	0	7	
		100.0%	0.0%	100.0%	
	FCHV	1	0	1	
		100.0%	0.0%	100.0%	
	Relative/friend	184	190	374	
		49.2%	50.8%	100.0%	
	Others	27	31	58	
		46.6%	53.4%	100.0%	
Total		324	239	563	
		57.5%	42.5%	100.0%	
Cross-tabulation between type of 1st child delivery and Cervical cancer					
		Cervical cancer		Total	
		Yes	No		
Type of 1st child delivery	Normal	316	239	555	
		56.9%	43.1%	100.0%	
	Cesarean section	8	0	8	
		100.0%	0.0%	100.0%	
Total		324	239	563	
		57.5%	42.5%	100.0%	

**Table 6.** Crosstabulation between Cervical cancer and sociodemographic variables



ANC checkup for first child and Cervical cancer					p-value	
		Cervical cancer		Total	0.001	
		Yes	No			
ANC checkup for first child	Yes	159	21	180		
		88.3%	11.7%	100.0%		
	No	165	218	383		
		43.1%	56.9%	100.0%		
Total		324	239	563		
		57.5%	42.5%	100.0%		
Carried heavy load after first child delivery and Cervical cancer					p-value	
		Cervical cancer		Total	0.00	
		Yes	No			
Carried heavy load after first child delivery	Yes	217	200	417		
		52.0%	48.0%	100.0%		
	No	107	39	146		
		73.3%	26.7%	100.0%		
Total		324	239	563		
		57.5%	42.5%	100.0%		
Work in the farm after 1st child delivery and Cervical cancer					p-value	
		Cervical cancer		Total	0.00	
		Yes	No			
Work on farm after 1st child delivery	Yes	162	173	335		
		48.4%	51.6%	100.0%		
	No	162	66	228		
		71.1%	28.9%	100.0%		
Total		324	239	563		
		57.5%	42.5%	100.0%		
Work as labourer after 1st child delivery and Cervical cancer					p-value	
		Cervical cancer		Total	0.00	
		Yes	No			
Work as labourer after 1st child delivery	Yes	110	151	261		
		42.1%	57.9%	100.0%		
	No	214	88	302		
		70.9%	29.1%	100.0%		
Total		324	239	563		
		57.5%	42.5%	100.0%		

Enough nutritious food after 1st child delivery and Cervical cancer					p-value
		Cervical cancer		Total	0.00
		Yes	No		
Enough nutritious food after 1st child's delivery	Yes	208	70	278	
		74.8%	25.2%	100.0%	
	No	116	169	285	
		40.7%	59.3%	100.0%	
Total		324	239	563	
		57.5%	42.5%	100.0%	
Wearing PATUKA and Cervical cancer					p-value
		Cervical cancer		Total	0.00
		Yes	No		
Wearing PATUKA	Yes	133	62	195	
		68.2%	31.8%	100.0%	
	No	191	177	368	
		51.9%	48.1%	100.0%	
Total		324	239	563	
		57.5%	42.5%	100.0%	

**Table 7.** Association between cervical cancer and selected variables

**Education and Awareness:** The national RH strategy emphasizes the importance of education and community participation. The research findings reflect how education levels correlate with the prevalence of POP/uterine prolapse and cervical cancer, suggesting that education and awareness programs could play a crucial role in addressing these issues.

**Healthcare Access and Utilization:** The global challenges highlighted by WHO underscore the importance of improving healthcare systems and access to services. Disparities in healthcare access and delivery assistance identified in the research findings indicate a need for targeted interventions to ensure equitable access to reproductive healthcare services, particularly for marginalized populations.

**Equality and Empowerment:** The ICPD agenda and the barriers identified in the WHO report emphasize the significance of gender equality and empowerment in RH initiatives. Addressing gender inequities and promoting women's empowerment could help mitigate the risk factors associated with POP/uterine prolapse

and cervical cancer, as evidenced by the disparities observed across different ethnic groups.

**Policy Implementation and Collaboration:** Nepal's commitment to aligning its policies with international frameworks like the ICPD agenda highlights the importance of policy implementation and collaboration among stakeholders. The significant associations observed in the research findings underscore the need for evidence-based policy interventions and multi-sectoral collaboration to address the prevalence and risk factors of POP/uterine prolapse and cervical cancer effectively.

## Discussion

The study finds several significant findings regarding reproductive health problems among women in the selected districts of Saptari, Siraha, Mahottari, and Dhanusha. One of the prominent findings was the high prevalence rates of cervical cancer and uterine prolapse. Cervical cancer was prevalent among 57.5% of the surveyed population, affecting 328 out of 570 women,

while uterine prolapse was found to afflict 42.5% of the women, with 242 out of 570 being affected. These figures highlight the substantial burden of reproductive health issues in the region and underscore the importance of targeted interventions to address these concerns. This finding was similar to the findings of <sup>15</sup>, which also reported the prevalence of uterine prolapse as 37% in western districts of Nepal and 20.1% in eastern Nepal, respectively.

Analysis of socio-demographic factors revealed notable associations with the prevalence of cervical cancer. Lower levels of education appeared to correlate with a higher incidence of cervical cancer, with a clear trend showing increased prevalence among women with lower educational attainment.

The observed disparities in the prevalence of cervical cancer and uterine prolapse among different education levels and ethnic groups raise important considerations regarding healthcare access and risk factors. The stark contrast in prevalence rates between uneducated and primary-educated participants underscores the potential impact of education on health outcomes. The surge in cervical cancer prevalence from 46.8% among uneducated participants to 87.5% among those with primary education suggests a possible link between education and awareness of preventive measures or healthcare-seeking behaviors. Similarly, the inverse relationship observed for uterine prolapse, with higher education levels associated with lower prevalence rates, hints at the role of education in mitigating risk factors or accessing appropriate healthcare interventions. These findings align with existing literature emphasizing the importance of education in promoting women's health and empowering them to make informed decisions about their well-being.

Furthermore, the analysis of ethnic disparities in the prevalence of uterine prolapse sheds light on potential socio-cultural influences on health outcomes. The variation in POP/uterine prolapse rates among different ethnic groups suggests that cultural practices, lifestyle factors, or socio-economic status may contribute to differential risk profiles. The notably high occurrence among Madhesi participants and relatively lower rates among Dalit participants highlight the complex interplay of ethnicity and health outcomes. However, it is essential to interpret these findings cautiously, considering the multifaceted nature of ethnicity and its intersectionality with other socio-economic factors. The contrasting findings with previous studies, such as those by <sup>16</sup>, underscore the nuanced understanding required to disentangle the influence of race, caste, and socio-economic status on reproductive health

outcomes. While disparities in uterine prolapse prevalence exist, it's crucial to acknowledge the dynamic and context-specific nature of these associations, which may vary across different populations and settings.

Reproductive history also emerged as a significant factor influencing health outcomes. Nearly all participants had experienced pregnancy and childbirth, yet there was no significant difference in the prevalence of cervical cancer and uterine prolapse between women who had been pregnant and those who hadn't. However, ANC checkups for the first child showed a significant association with cervical cancer prevalence, indicating the importance of antenatal care in early detection or prevention efforts. Postpartum activities exerted a noteworthy impact on health outcomes, particularly regarding workload and nutritional factors. Women who engaged in heavy lifting or worked on farms after their first child delivery exhibited higher prevalence rates of cervical cancer. Access to nutritious food after childbirth also demonstrated a significant association with cervical cancer prevalence, suggesting the importance of postpartum care and dietary support in mitigating health risks.

The findings of this study shed light on the complex interplay between socio-demographic factors, reproductive health experiences, healthcare utilization patterns, and the prevalence of pelvic organ prolapse (POP)/uterine prolapse and cervical cancer within the surveyed population. Triangulating these findings with established national and global reproductive health (RH) policies offers insights into the broader context shaping the reproductive health landscape in Nepal.

**Alignment with National RH Policies:** The comprehensive national strategy for Reproductive Health (RH) outlined <sup>17</sup> underscores the government's commitment to providing integrated RH services with a focus on community participation, gender perspectives, and key interventions such as family planning and safe motherhood. Our findings reveal significant associations between educational levels, ethnicity, reproductive history, healthcare access, and the prevalence of POP/uterine prolapse and cervical cancer. These associations underscore the importance of aligning policy interventions with the diverse needs of the population to effectively address reproductive health challenges.

**Implications for Policy Implementation:** The global reproductive and sexual health challenges highlighted by the <sup>18</sup> emphasize the importance of data-driven strategies, stakeholder collaboration, and addressing

barriers to healthcare access, particularly for marginalized populations. Our research findings underscore the disparities in healthcare utilization and delivery assistance, suggesting the need for targeted interventions to improve access to reproductive healthcare services and reduce the burden of POP/uterine prolapse and cervical cancer, especially among vulnerable groups.

**Relevance of International Agendas:** The International Conference on Population and Development (ICPD) agenda, established in 1994, remains highly relevant in Nepal's efforts to advance sexual and reproductive health rights and gender equality. The country's progress in aligning national policies with the principles of the ICPD Programme of Action reflects a commitment to achieving tangible outcomes in family planning, reproductive health, and women empowerment. Our findings highlight the significance of addressing socio-cultural factors, gender inequities, and healthcare access barriers in realizing the goals outlined in the ICPD agenda.

**Holistic Approach to RH Challenges:** Taking a comprehensive approach to reproductive health challenges is essential. This involves integrating various strategies simultaneously to address the issues effectively. Firstly, it necessitates implementing educational programs to enhance awareness and knowledge about reproductive health among the population. Secondly, there is a need to enhance the quality of healthcare facilities and services to ensure that individuals receive adequate support and treatment for reproductive health conditions. Thirdly, addressing gender disparities and promoting equality in healthcare provision are crucial components of this approach. Lastly, fostering collaboration among policymakers, healthcare professionals, and community stakeholders is vital for developing and implementing evidence-based policies and interventions. By incorporating these measures, informed by national strategies and international agendas, Nepal can progress towards achieving key objectives such as eliminating unmet family planning needs, reducing maternal mortality, and combating gender-based violence.

## Conclusion

The findings of this study underscore the significant disparities in the prevalence of cervical cancer and uterine prolapse among women in the selected districts of Saptari, Siraha, Mahottari, and Dhanusha. Education level and ethnicity emerged as important determinants of health outcomes, with lower education levels and

certain ethnic groups exhibiting higher prevalence rates of cervical cancer and uterine prolapse. The stark differences in prevalence rates across education levels and ethnicities highlight the need for targeted interventions aimed at promoting education, raising awareness, and addressing socio-cultural determinants of health. Furthermore, the discussion around ethnic disparities in uterine prolapse prevalence underscores the complex interplay of socio-cultural factors in shaping health outcomes. While ethnicity may influence health outcomes, the nuances of these associations warrant further investigation to develop context-specific interventions that address the underlying determinants of health disparities. Overall, the study underscores the importance of addressing socio-demographic disparities in reproductive health outcomes to ensure equitable access to healthcare services and interventions. Efforts to promote education, raise awareness, and tailor healthcare interventions to the specific needs of diverse ethnic groups are crucial steps toward mitigating the burden of cervical cancer and uterine prolapse in the studied regions.

## Statements and Declarations

### *Ethical Approval Statement*

The study was approved by the Ethical Review Board of the Nepal Health Research Council, Nepal (Reference Number: 240/20234, April 2023).

### *Informed Consent Statement*

Informed consent was obtained from all participants in accordance with the ethical research standards and guidelines of the Nepal Health Research Council.

## Footnotes

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<sup>17</sup> Ministry of Health and Population, *supra* note 12.

<sup>18</sup> World Health Organization, *supra* note 13.

## Declarations

**Funding:** No specific funding was received for this work.

**Potential competing interests:** No potential competing interests to declare.