

# Does intimate partner violence influence the utilization of maternal health services?

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## Research article

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# Abstract

Background: Intimate partner violence [IPV] is a public health problem globally and most common in developing countries that affects more than one fourth of women of reproductive age [WRA]. It is more critical during pregnancy. IPV not only affects physical and mental well-being but also leads to negative consequences in with birth outcomes. Methods: We conducted a secondary data analysis of the Nepal Demographic and Health Survey 2016 to assess the association between IPV and maternal service utilization: ANC visits and institutional delivery. Altogether 1374 WRA were randomly selected.

Background characteristics of WRA and IPV were the independent variables and ANC visits and institutional delivery were the dependent variables. Results: Data showed that 26 percent of WRA had faced at least one form of IPV, 68 percent had visited health facilities at least four times for ANC check-ups during pregnancy, and the rate of institutional delivery was 61 percent. There were associations among IPV with ANC visits and institutional delivery ( $p < 0.001$ ). Age group, educational level, ethnicity, number of children, residence setting, and wealth status of WRA were significantly associated with ANC visits and institutional delivery ( $p < 0.001$ ). Conclusion: IPV, educational level, and wealth status of WRA were significant predictors for maternal health service utilization. Policy makers should incorporate these significant predictors during planning and interventions as well.

## Background

Violence whether from intimate partners or from others has a significant impact on public health. But intimate partner violence [IPV] is most critical influence on public health, since it is most common and affects a disproportionate number of women in Nepal. There are different forms of IPV: physical, mental, psychological or mixed forms (1). IPV during pregnancy is a global health issue and is most common in low and middle income countries which creates serious health consequences for women and children. IPV not only creates physical problems and injuries, but also can lead to mental disorders, homicides and even suicides too (2). For example, a large body of evidence shows that IPV is strongly associated with mental disorders in women (3).

Women are at more risk of being exposed to IPV during pregnancy (4). Physical consequences such as a low birth weight, premature birth, birth with disabilities, miscarriage, and perinatal mortality are some examples of important health outcomes that are related to IPV. Some studies suggest that IPV is a predisposing factor for delinquent, hyperactivity, aggressiveness, anti-social behaviours, anxiety, depression as well as somatic symptoms for children if their mothers faced any form of violence during pregnancy (2). IPV also can lead to unintended pregnancy. Nearly 15 percent of the total number of pregnancies is reported to be unintended due to IPV(5). Another study shows that more than one third (37%) of the participants reported that they had faced some type of IPV during their lifetime (6,7). IPV is not only a major issue in developing countries, but also persists in developed countries. For example, Chisholm et al. (2017) state that IPV such as suicide and homicide are still the major causes of pregnancy related mortality in many localities in the USA. A study from Uganda shows that women

having disabilities were more vulnerable to IPV compared to the women without disabilities (8). IPV not only persists with community members, but also with university students too (9).

Dramatic evidence shows that nearly one third of women aged more than 15 years have had experience of IPV during their lifetime globally, and nearly two-thirds of the women in East Asia have experienced IPV (10). IPV during pregnancy leads to negative consequences not only for the mother but also affects children, general women's health, and the economy (11). It is claimed that the cost of IPV is five percent of the total gross domestic product [GDP] (12).

WHO defines IPV as "any behaviour within an intimate relationship that causes physical damage, psychological or sexual abuse to a woman in the relationship, including physical assault, psychological abuse, forced intercourse and other forms of sexual coercion and of controlling behaviours" (10).

Similarly, IPV is defined as "physical, psychological and/or sexual violence that occurs between intimate partners (including cohabiting or divorced intimate partners, independent of gender)" (13). It is universal phenomenon and an intentional manifestation of physical force, sexual and emotional abuse, use of any power to cause harm against women from intimate partners (14). Interestingly, not only women but also the gay, bisexual and other men having sex with men [GBMSM] also violated by intimate partner. A study at London shows that GBMSM also victimized by IPV(15). Besides these, child also influenced by IPV. Eighteen percent of children had faced IPV in United States that leads homelessness, involvement in criminal activities, unemployed and chronic health conditions (16).

The sustainable development goal number five incorporates achieving gender equality and empowering all women and girls and the sustainable development goals number 5.1 and 5.2 have recommended ending and eliminating all kind of violence and discrimination against women and girls (17). Similarly, the Constitution of Nepal has also declared eliminating all kinds of discrimination and violence against women and child to be a national goal (18).

IPV significantly influences public health. IPV destroys life in some instances though it can be preventable (1). IPV not only affects the mother but also the child and family as well. Some major components to being healthy, such as breast feeding, good parenting family harmony are also negatively affected by IPV. Studies show that there are associations between IPV and difficulties with breast feeding that ultimately negatively affect child health (14). Furthermore, IPV against pregnant women is likely to lead to depressive symptoms, anxiety, a low level of attachment with infants, and problems with breast feeding (4). Moreover, IPV leads to serious problems with pregnancy as well as with birth outcomes that ultimately negatively affects the gross domestic product and the national economy as well (19).

Very few research studies have been conducted concerning IPV and its consequences for women's health as well as for utilization of maternal health services which are provided free of cost from government health facilities. So, there is a lack of evidence based information about the influences of IPV on maternal health service utilization. This paper aims to fill these research gap by examining the associations among background characteristics of participants, IPV, and utilization of maternal services, especially ANC visits and institutional delivery.

## Methods

This study involves a secondary analysis of data from the Nepal Demographic and Health Survey [NDHS] 2016 to assess the associations among background characteristics of women who have had live births within five-years of the NDHS, 2016; intimate partner violence; and utilization of maternal services. So participants in the study were mothers who had live births within the five-year preceding the survey. The NDHS is a nationally representative household-based survey conducted on 19<sup>th</sup> June 2016 to 31<sup>st</sup> January 2017. The NDHS 2016 administration was the fifth survey of this type conducted and the main objectives of the NDHS 2016 was to provide up-to-date estimates of basic demographic and health indicators (20).

This study analysed four or more visits for antenatal care [ANC], and delivery at health facility as dependent variables with IPV with and socio-demographic background characteristics as independent variables (such as age group, educational status, ethnicity, number of children, religion, women's autonomy for household decision, residence setting, employment status, wealth status). The dependent variables were categorized into two attributes for each i.e. (i) less than four ANC visits; and equal or more than four ANC visits; and (ii) delivery at home; and health facilities for the variables: ANC visits and place of delivery respectively. We merged or manipulated some attributes of the variables due to poor responses to make meaningful the bivariate and multivariate analyses.

The study protocol was reviewed and ethical approval was approved from Nepal Health Research Council and the ICF Institutional Review Board. The consent was taken prior to conducting interviews with the participants. The questionnaire was the tool for data collection which was translated into Nepali, Maithili and Bhojpuri from English as it required. Data were collected by using tablet computers to facilitate the computer assisted personal interviewing.

The NDHS was designed to represent the national population of women aged 15-49 years. Altogether a sample of 12,862 respondents from this reproductive age group of women were selected based on national household census data 2011. Among them only 1,374 mothers were included who had most recent live birth in the five-year preceding the NDHS 2016. Univariate [frequency and percentage], bivariate [chi-square test], and multivariate [binary logistic regression] were performed to assess the results. We used statistical package for social science [IBM SPSS Statistics 20] for statistical analysis. ramme recommends at least four times ANC visits (22).

## Results

### *Background characteristics of the participants*

Of the participants, nine out of ten were less than 35 years of age. Among the participants, 49 percent were from 25 to 34 years of age, 41 percent were less than 25 years of age, and the rest of the respondents were more than 34 years of age. Data show that more than two thirds (68%) were literate (which was just over the literacy rate than the population and housing census 2011 which was recorded

as 57 percent of females) (21). More than one third (34%) were from indigenous group (Adibasis/Janajatis), 28 percent were from Brahmin/Chhetri and rest of them were from Dalit and other castes of Nepal.

Nearly one third of the participants had no children or only one child, 32 percent of the participants had two children, 15 percent had three children, and 17 percent had four or more children respectively. Of the participants, 86 percent were Hindu, whereas six, five, and three percent were from Islam, Buddhist and Kirat/Christian religious faiths respectively, which was as similar to the overall population and housing census 2011 (21). One third of the participants expressed that they had no role in their household's decision-making process, whereas one third expressed moderate autonomy in household decision making. Most of the participants (54%) were from urban areas and 53 percent were engaged in some kind of employment.

Forty-three percent of the participants were from poor economic backgrounds; 21 percent had middle wealth status, whereas 37 percent had rich wealth status. Nearly 22 percent of the participants had experienced physical violence; 13 percent faced emotional violence; eight percent faced sexual violence; and more than one fourth had faced some kind of violence from their husbands/partners. More than two third (68%) of the participants had visited health facilities for antenatal check-ups (ANC) at least four times and 39 percent of the participants expressed that their latest deliveries were performed at their home despite the fact that the Government has encouraged intuitional delivery by reverse paying as transport incentive [NRs. 1000 to 3000 as per geo-belt] and the safe motherhood programme recommends at least four times ANC visits (22).

**Table 1: Background characteristics of participants (married women)**

<b>Variables</b>	<b>Category</b>	<b>%</b>	<b>N</b>
Age group	Less than 25 years	40.7	559
	25-34	48.6	668
	35 or above	10.7	147
Education	No education	31.8	437
	Primary	19.7	270
	Secondary or above	48.5	667
Ethnicity	Brahmin/Chhetri	28.2	388
	Janajatis	34.0	467
	Dalit	14.6	201
	Other	23.2	318
Total Children	None/one	35.8	492
	Two	32.3	443
	Three	15.0	206
	Four or more	16.9	233
Religion	Hindu	85.9	1180
	Buddhist	4.8	65
	Islam	6.1	84
	Kirat/Christian	3.2	44
Women's autonomy in household decision	No autonomy	33.4	458
	Moderate autonomy (involved in 1-2 issues)	34.2	470
	High autonomy (involved in all 3 issues)	32.4	445
Place of residence	Urban	53.6	736
	Rural	46.4	637
Currently working	No	46.8	643
	Yes	53.2	731
Wealth index	Poor	42.7	587
	Middle	20.6	283
	Rich	36.7	504
Physical violence by husband/partner	No	78.2	1074
	Yes	21.8	300
Emotional violence by husband/partner	No	87.4	1201
	Yes	12.6	173
Sexual violence by husband/partner	No	92.2	1266
	Yes	7.8	108
At least one violence from husband	No	74.4	1022
	Yes	25.6	352
Number of ANC visits for the most recent live birth in the five-year preceding the survey	Less than 4 visit	31.7	436
	4 or more visits	68.3	938
Place of delivery for the most recent live birth in the five- year preceding the survey	Home	38.8	533
	Health facilities	61.2	841
<b>Total</b>		<b>100.0</b>	<b>1374</b>

*Experiences of violence and utilization of maternal health service*

Data collected showed that experience of violence may play a significant role in maternal service utilization. There was a negative association found between experience of violence and utilization of maternal health services. Seventy-one percent of the participants who did not face physical violence during pregnancy had visited health facilities for ANC check-up more than four times whereas just 57 percent of the participants, who had faced physical violence, visited health facilities for ANC check-ups four or more times during pregnancy which was statistically significant ( $p < 0.001$ ). Similarly, only 57 percent of the mothers who faced emotional violence had visited health care facilities four or more times for ANC check-up compared to 70 percent who visited health care facilities for ANC check-ups four or more times who did not face emotional violence ( $p < 0.001$ ). In the same way, only 55 percent of the participants who had faced sexual violence, had four or more ANC visits compared to 69 percent of those who reported four or more ANC visits during pregnancy. The majority of the participants (72%), who did not experience any kind of violence from husband, had visited health facilities four or more time for ANC compared to 58 percent who had faced at least one violence from husbands/partners ( $p < 0.001$ ).

Data showed that institutional delivery was influenced by women's experience of any type of violence. A significantly lower percentage of women ( $p < 0.001$ ) who faced physical violence had utilized delivery services (49%) from health facilities compared to those who did not faced physical violence (65%). Similarly, the same results were observed from those women who experienced any type of violence and delivery at health facilities. Sixty-four and 52 percent of deliveries were conducted in health care facilities for those women who did not experience any kind of violence and who had experienced at least one instance of violence from intimate partners respectively ( $p < 0.001$ ).

Socio-demographic or background characteristics also influenced the number of ANC visits and institutional delivery. Data showed that the lower the age, the higher the number of ANC visits, and the higher the institutional delivery. Seventy-three percent of the participants who were less than 25 years of age, visited health care facilities four or more times for ANC compared to 67 and 54 percent by women in the age group of 25 to 34 years, and those women who were more than 34 years of age respectively ( $p < 0.001$ ). Data showed the education and ANC visits were positively and significantly associated with higher levels of education and higher utilization of maternal health services ( $p < 0.001$ ). Eighty-three percent of the respondents, who had secondary education levels, visited health facilities for ANC check-ups more than four times. But less than half (49%) of the respondents who had no formal education visited health care facilities for ANC check-ups more than four times ( $p < 0.001$ ). Those women who were of Brahmin and Chhetri caste utilized the maternal health services [four or more ANC visits] more often than the women from the other ethnicities/castes ( $p < 0.001$ ).

Negative relationships were observed between the number of children and more than four ANC visits. The higher the number of children and the lower levels of maternal service utilization ( $p < 0.001$ ). Eighty-two percent of the respondents who had none/one child visited the health facilities for antenatal services compared to 37 percent of those who had four or more children. Three fourth of the participants, who followed the Buddhist religions, received more the four ANC check-ups services compared to 67 and 54 percent of the Hindu and Islam women respectively ( $p < 0.05$ ). Data showed that the higher the women's

reported autonomy in household decision making, the higher their number of ANC check-ups visits. However, the association was not significant.

Three fourth of the participants who resided in urban areas had more than three ANC check-up visits compared to women from rural areas which accounts for 61 percent ( $p<0.001$ ). Employment status of the women also was associated with the utilization of ANC services. Seventy-one percent of the participants who engaged in any kind of occupation, visited health facilities more than three times for maternal health services ( $p<0.05$ ) compared to the participants (65%) who had no job. Wealth index was also associated with maternal health service utilization. Eighty percent of the participants who were rich visited health care facilities for ANC check-ups four or more times compared to middle (65% of the participants) and poor (59% of the participants) ( $p<0.001$ ).

Nearly the same results were observed concerning institutional delivery. Data showed that 68 percent of the participants who were less than 25 years of age conducted their last delivery at health care facilities compare to 57 and 53 percent of the women in the age groups of 25 to 34 years and more than 34 years of age ( $p<0.001$ ). Education played positive role in institutional delivery. Seventy-eight percent of participants who had secondary or higher levels of education gave their last birth at health care facilities. But only 56 and 40 percent of the participants who had primary and no educational attainment conducted their last births at health care facilities ( $p<0.001$ ). Seventy percent of participants who belonged to Brahmin/Chhetri castes received delivery services from health care facilities whereas 63 and 56 percent of Janajatis and Dalit castes received delivery services from health care facilities respectively ( $p<0.001$ ).

Table 2: Experience of violence and maternal health service utilization

Variables	ANC visits #		Place of delivery ##		Total	
	<4 visits	≥4 visits	Home	Health facilities	%	N
<b>Experience of violence</b>						
<b>Physical violence</b>	***		***			
No	28.6	71.4	35.3	64.7	100.0	1074
Yes	42.9	57.1	51.5	48.5	100.0	300
<b>Emotional violence</b>	***		*			
No	30.1	69.9	37.6	62.4	100.0	1201
Yes	43.3	56.7	47.5	52.5	100.0	173
<b>Sexual violence</b>	**		*			
No	30.6	69.4	38.6	61.4	100.0	1266
Yes	45.2	54.8	40.9	59.1	100.0	108
<b>At least one violence from husband</b>	***		***			
No	28.4	71.6	35.7	64.3	100.0	1022
Yes	41.6	58.4	47.9	52.1	100.0	352
<b>Socio-demographic characteristics</b>						
<b>Age group</b>	***		***			
Less than 25 years	26.9	73.1	32.1	67.9	100.0	559
25-34	32.7	67.3	42.7	57.3	100.0	668
35 or above	45.9	54.1	46.7	53.3	100.0	147
<b>Education</b>	***		***			
No education	51.3	48.7	60.3	39.7	100.0	437
Primary	35.4	64.6	44.5	55.5	100.0	270
Secondary or above	17.5	82.5	22.4	77.6	100.0	667
<b>Ethnicity/Caste</b>	***		***			
Brahmin/Chhetri	21.2	78.8	29.8	70.2	100.0	388
Janajatis	30.1	69.9	37.1	62.9	100.0	467
Dalit	35.4	64.6	44.2	55.8	100.0	201
Other	44.7	55.3	48.9	51.1	100.0	318
<b>Number of children</b>	***		***			
None/one	17.8	82.2	20.3	79.7	100.0	492
Two	28.1	71.9	37.4	62.6	100.0	443
Three	37.8	62.2	54.5	45.5	100.0	206
Four or more	62.8	37.2	66.7	33.3	100.0	233
<b>Religion</b>	*		NS			
Hindu	31.2	68.8	38.4	61.6	100.0	1180
Buddhist	25.2	74.8	40.9	59.1	100.0	65
Islam	45.6	54.4	48.4	51.6	100.0	84
Kirat/Christian	29.1	70.9	27.4	72.6	100.0	44
<b>Women's autonomy in household decision</b>	NS		NS			
No autonomy	34.7	65.3	42.2	57.8	100.0	458
Moderate autonomy (involved in 1-2 issues)	32.1	67.9	36.4	63.6	100.0	470
High autonomy (involved in all 3 issues)	28.3	71.7	37.8	62.2	100.0	445
<b>Place of residence</b>	***		***			
Urban	25.2	74.8	30.3	69.7	100.0	736
Rural	39.3	60.7	48.7	51.3	100.0	637
<b>Currently working</b>	*		**			

No	34.7	65.3	34.5	65.5	100.0	643
Yes	29.2	70.8	42.6	57.4	100.0	731
<b>Wealth index</b>		***		***		
Poor	40.6	59.4	56.1	43.9	100.0	587
Middle	34.7	65.3	35.8	64.2	100.0	283
Rich	19.8	80.2	20.4	79.6	100.0	504
<b>Total</b>	<b>31.7</b>	<b>68.3</b>	<b>38.8</b>	<b>61.2</b>	<b>100.0</b>	<b>1374</b>

Note: # = number of ANC visits for the most recent live birth in the five-year preceding the survey; ## = place of delivery for the most recent live birth in the five-year preceding the survey; NS = not significant; \*\*\* = significant at  $p < 0.001$ ; \*\* =  $p < 0.01$ ; and \* =  $p < 0.05$

The number of children the women had negatively associated with accessing institutional delivery. The higher the number of children, the lower the rate of institutional delivery was observed. Eighty percent of the participants who had none/one child received natal services from health facilities whereas 63 and 46 percent of participants who had two and three children received delivery services from health facilities respectively ( $p < 0.001$ ). Sixty-two percent of the participants who belonged to the Hindu religion received delivery services from health care facilities whereas just 59 and 52 percent of Buddhist and Islam religions received natal services from health care institutions.

Participants' residence performed key role in utilization of maternal services. Data showed that 70 percent of the participants residing in urban areas received natal services at health care facilities compared to 51 percent of the participants from rural residence area ( $p < 0.001$ ). Two-third of the participants who were not currently working received delivery services from health facilities and 57 percent of participants who were currently working received delivery services from health care facilities ( $p < 0.01$ ). Wealth status of the participants had a positive association with delivery services utilization. Eighty percent of the participants, who were rich received delivery services from health care facilities followed by middle income women (64%) and poor women (44 %) respectively ( $p < 0.001$ ).

### ***Adjusted odds ratios for utilization of maternal health services***

Data showed that participants who faced at least one form of violence from husbands or partners were less likely to receive four or more ANC check-ups visits compared to women with no experience of violence from husbands/partners (aOR = 0.74, CI [0.56 – 0.98],  $p < 0.05$ ). Similarly, participants who had experienced at least one form of violence were less likely to receive delivery services at health care facilities (aOR = 0.80, CI [0.60 – 0.90],  $p < 0.05$ ). Participants who were 34 or more years of age were less likely to have four or more ANC check-up visits (aOR = 0.58, CI [0.37 – 0.91],  $p < 0.05$ ) compared to women who were less than 25 years of age. Similarly, participants who were between 25 to 34 of age years were less likely to receive natal service during delivery from health care facilities compared to women who were less than 25 years of age (aOR = 0.86, CI [0.52 – 0.89],  $p < 0.01$ ). Educational status was significant predictor for both number of ANC visits and institutional delivery. Participants having primary; and secondary or higher level of education were more likely to receive ANC check-up visits four or more time

(aOR = 1.62, CI [1.16 – 2.26], p<0.01; aOR = 3.03, CI [2.17 – 4.22], p<0.001) and more likely to receive delivery services from health care facilities compared to those who had no education respectively (aOR = 1.68, CI [1.20 – 2.35], p<0.01; aOR = 3.10, CI [2.24 – 4.29], p<0.001).

Table 3: *Adjusted odds ratios (aOR) for maternal health services (4<sup>th</sup> ANC visit and delivered at health facility) for the last birth within the past five-year by selected predictors*

Selected predictors	≥ 4 ANC visits			Delivered at health facility		
	aOR	95% CI		aOR	95% CI	
		Lower	Upper		Lower	Upper
<b>Experience of violence</b>						
<b>Violence from husbands/partners (at least one form)</b>						
No (ref)	1.00			1.00		
Yes	0.74*	0.56	0.98	0.80*	0.60	0.90
<b>Socio-demographic characteristics</b>						
<b>Age group</b>						
Less than 25 years (ref)	1.00			1.00		
25-34	0.82	0.62	1.09	0.68**	0.52	0.89
35 or above	0.58*	0.37	0.91	0.89	0.57	1.39
<b>Education</b>						
No education (ref)	1.00			1.00		
Primary	1.62**	1.16	2.26	1.68**	1.20	2.35
Secondary or above	3.03***	2.17	4.22	3.10***	2.24	4.29
<b>Ethnicity</b>						
Brahmin/Chhetri (ref)	1.00			1.00		
Janajatis	0.59**	0.42	0.85	.64*	0.45	0.90
Dalit	0.75	0.49	1.15	.76	0.50	1.14
Other	0.46***	0.29	0.71	.38***	0.24	0.59
<b>Religion</b>						
Hindu (ref)	1.00			1.00		
Buddhist	1.86	0.97	3.56	1.08	0.58	2.01
Islam	1.07	0.62	1.83	1.16	0.68	2.04
Kirat/Christian	1.27	0.62	2.60	1.97	0.94	4.15
<b>Women's autonomy in household decision</b>						
No autonomy (ref)	1.00			1.00		
Moderate autonomy (involved in 1-2 issues)	0.88	0.64	1.19	1.08	0.79	1.46
High autonomy (involved in all 3 issues)	1.14	0.83	1.56	1.07	0.78	1.46
<b>Place of residence</b>						
Urban (ref)	1.00			1.00		
Rural	0.72*	0.56	0.93	.68**	0.53	0.88
<b>Currently working</b>						
No (ref)	1.00			1.00		
Yes	1.46**	1.11	1.91	.78	0.60	1.03
<b>Wealth index</b>						
Poor (ref)	1.00			1.00		
Middle	1.77**	1.25	2.51	3.06***	2.16	4.33
Rich	2.53***	1.82	3.52	4.41***	3.18	6.11
<i>Constant</i>	<i>1.437</i>			<i>1.06</i>		
<i>Cox &amp; Snell R Square</i>	<i>.146</i>			<i>.204</i>		
<i>-2 Log likelihood</i>	<i>1500.5</i>			<i>1521.3</i>		

Note: \*\*\* = significant at p<0.001; \*\* = p<0.01; and \* = p<0.05

Participants who belonged to the Janajatis caste were less likely to receive ANC check-ups four or more times compared to those women from Brahmin and Chhetri castes (aOR = 0.59, CI [0.42 – 0.85],  $p < 0.01$ ). Similarly, women from the Janajatis castes were less likely to receive delivery services from health facilities compared to women from the Brahmin and Chhetri castes (aOR = 0.64, CI [0.45 – 0.90],  $p < 0.05$ ). In case of religion, other religions than Hindu were more likely to receive four or more ANC services and delivery services from health facilities.

The participants who had high autonomy (involved in all three issues) tended to have four or more ANC visits and receive delivery services from health facilities. But, the participants residing in rural areas were less likely to have four or more ANC check-up visits compared to participants residing urban areas (aOR = 0.72, CI [0.56 – 0.93],  $p < 0.05$ ). Similarly, participants residing rural areas were less likely to receive delivery services from health facilities compared to those who were resided in urban areas (aOR = 0.68, CI [0.53 – 0.88],  $p < 0.01$ ). Participants who were currently working (held a job) tended to have four or more ANC visits compared to those who had no job (aOR = 1.46, CI [1.11 – 1.91],  $p < 0.01$ ) but were less likely to have institutional delivery. Wealth status was a key predictor for maternal health service utilization. Participants having middle and rich wealth status tended to have four or more ANC check-up visits compared to those who were poor (aOR = 1.77, CI [1.25 – 2.51],  $p < 0.01$ ; aOR = 2.53, CI [1.82 – 3.52],  $p < 0.001$ ). Similarly, participants having middle and rich levels of wealth were more likely to have delivery at health facilities compared to those who were poor (aOR = 3.06, CI [2.16 – 4.33],  $p < 0.001$ ; aOR = 4.41, CI [3.18 – 6.11],  $p < 0.001$ ).

## Discussion

Results showed that more than one fourth of the women, who had their last birth within the past five-year preceding the NDHS 2016 was conducted faced at least one act of violence from their husbands/partners. Nearly one third of them did not have at least four ANC check-up visits and more than one third had experience of delivery at home. Data showed that higher numbers of acts of violence is associated with the lower rates of the maternal health care service utilization. Similarly, higher age of women is associated with lower utilization of maternal health services. Whereas higher education status is associated with higher utilization of ANC check-ups and natal care. Data showed that women having more children is associated with lower utilization of maternal health care services. Urban women were more likely to utilize maternal health care services compared to those women who live in rural areas. Interestingly, employed women were more likely to utilize ANC check-up services but were less likely to utilize of delivery services from health care facilities. Economically rich women utilize more maternal health care services than middle class and poor women. Multivariate analyses showed that younger rather than older women, educated rather than uneducated women, women from Brahmin and Chhetri castes rather than other castes, women from urban rather than rural areas, and richer rather than poorer women were more likely to utilize maternal health care services available at free of cost at government and other health facilities.

Various studies from other countries support these results. One fourth of the participants had faced at least one act of violence from husbands/partners in Nepal, but nearly three fourths of the pregnant women had faced at least one form of IPV during their current pregnancy in Iran (4) which is three folds compared to Nepal but more than one third from the US have had an experience of IPV which is similar to Nepal in terms of IPV rate (19).

A study conducted in one district of Nepal, Dhanusha shows that 29 percent of pregnant mothers had faced at least one type of IPV during their pregnancy (23). Similarly, another study by Laelago, Belachew, and Tamrat (2017) observed that about 23 percent of women had faced IPV during their pregnancy in Ethiopia. So, it can be concluded that nearly one fourth of the mothers in these countries have also confronted IPV during their pregnancies. In the same ways, these studies also support the results that IPV during pregnancy was associated with low utilization of maternal health services (23). A study from Wuhan, China also showed that IPV was associated with prenatal depression that leads to adverse birth outcomes (25).

Some controversial statements were observed that elder women were more vulnerable for IPV and their later life can be complex (26) but this study showed that younger women were more vulnerable than older women. So, type and magnitude of IPV and its effects may be different in different socio-geographical contexts. A study from Ethiopia showed that low birth weight and pre-term birth were associated with IPV (24,27). So, IPV not only influences the mother but also affects birth outcomes too in Ethiopia. Exposure to any form of violence appears to lead to barriers to maternal health service utilization (28).

Employment has been found to be a predictor for IPV during pregnancy. A study conducted in New York City showed that 79 percent of the respondents were victimized by IPV. In the same way, higher education has been associated with lower levels of IPV which supports the findings in this study (29). Previous research also supports that younger age and poor financial status were associated with IPV during pregnancy as observed by Doi et al. (2019). Another study showed that poverty, lack of education and food security is associated with IPV during and after pregnancy (30,31). Appropriate interventions have been shown to help minimize and control IPV as various experiments demonstrated at in several countries (32).

A systematic review and meta-analysis [SRMA] showed that IPV reduces utilization of maternal health services by 25 and 20 percent in ANC visits and delivery services by skilled health worker respectively (33). Similarly, another SRMA from Ethiopia showed that women's and partners' educational status, as well as partners' alcohol use were significant predictors for IPV (34). A study conducted at different districts of Nepal namely, Nawalparasi, Chitwan and Kapilvastu showed nearly the same results that so called 'low caste', women's employment, income, inadequate marital discussion were associated with IPV (35) but another study showed that IPV was not associated with modern contraceptive use (36). All these studies support the present study and it can be concluded that IPV is significantly associated with maternal health services utilization.

# Conclusions

Data and evidences from the current study and from a review of the literature show that IPV is a significant predictor for the utilization of health services during pregnancy. Therefore, clinical, educational, legal as well as motivational interventions should be planned and implemented to overcome the violence by intimate partner. Intervention programmes should focus on assisting women who face violence from their intimate partners, women over 25 years of age, with limited education, from Janajatis, Dalit and other castes, rural and poor women since they appear to be more vulnerable compared to other women in Nepal.

# List Of Abbreviations

ANC: Ante-natal care; GDP: Gross domestic product; IPV: Intimate partner violence; NDHS: Nepal Demographic and Health Survey; WHO: World Health Organization; WRA: Women of reproductive age

# Declarations

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## Availability of data

Secondary data available from MEASURE DHS+ upon request.

## Ethical approval

The study protocol was reviewed and ethical approval was approved from Nepal Health Research Council and the ICF Institutional Review Bard.

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## Authors' contributions

DA is the principle author of this article. DA and RA designed the study. RA analysed the data. DA, RA, CR, RP, PBT, and GLK all involved in draft preparation, read/approved the final manuscript, and agreed to submit for publication.

## Consent for publication

Not applicable. No personal data have been included.

## Conflict of interest

The authors declare that there is no conflict of interest. No fund is available for this study/paper.

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