Article

Disability, Caste, and Intersectionality: Does Co-Existence of Disability and Caste Compound Marginalization for Women Seeking Maternal Healthcare in Southern Nepal?

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Abstract: Background: Disability and caste are two different forms of oppression; however, people of the Dalit caste in Nepal and people with disabilities commonly face similar types of marginalities. Dalit women with disabilities may experience double discrimination because of the intersectionality of disability and caste. This study examines whether the disability and caste identity of women together affects and compounds the utilization of maternal healthcare services. Methods: A cross-sectional survey was conducted using a semi-structured questionnaire among a total of 354 Dalit and non-Dalit women, with and without a disability aged between 15–49 years. Maternal healthcare service utilization was assessed by antenatal care (ANC), health facility (HF) delivery, and postnatal care (PNC) during the last pregnancy. Logistic regression was performed to detect the predictors of service utilization and identify whether disability and caste were associated with service utilization. First, disability and caste were fitted separately in models. Secondly, the intersectionality of disability and caste was tested by inclusion of a disability*caste interaction term. Finally, the confounding effect of socio-demographic factors was investigated. Results: Out of surveyed women, 73% had 4+ ANC visits, 65% had HF delivery, and 29% had a PNC visit during their last pregnancy. Women with a disability had lower odds of HF delivery (OR 0.50, CI 0.30–0.84) and PNC (OR 0.47, CI 0.25–0.88) than women without a disability. Adjustment for women's age and household wealth explained associations in HF delivery by women with disabilities. There was no association between caste and service utilization. Disability overrode caste, and there was no other evidence of effect modification by women's caste status in the utilization. However, a weak interaction effect in the utilization of ANC services was found in the caste group by their education (OR 0.19, 95% CI 0.05–0.74). Conclusions: Disabled women—whether Dalit or non-Dalit—had lower rates of utilizing all maternal healthcare services than non-disabled women. Interestingly, Dalit women with disabilities were more likely to receive PNC than non-Dalit women with disabilities. Increasing equity in maternal healthcare service utilization requires that traditional approaches to service development and program intervention be re-examined and more nuanced interventions considered to ensure improved access and outcomes among all vulnerable groups.

Keywords: disability; caste; intersectionality; maternal health; healthcare service utilization; Nepal

1. Background

Despite good progress in the past two decades, maternal mortality in Nepal remains high at 238 per 100,000 live births [1]. Disparities in health and healthcare access, delays

in seeking and obtaining care, and poor quality of care due to lack of skilled health professionals are key contributing factors to maternal deaths [2,3]. Studies also show significant differences in the utilization of maternal healthcare services and health outcomes among social groups [4,5].

Out of 125 ethnic and caste groups in Nepal, the 2010 census listed 28 social groups as Dalits ('untouchables'), comprising 13.6% of the population [6,7]. *'Dalits' are at the bottom of the caste hierarchy, and the word literally means ''oppressed''.* The caste system and the discrimination linked to this manifest as a rigid form of exploitation and oppression in South Asia that has left some groups, such as the Dalits, marginalized and vulnerable [8]. The caste system is a complex culturally constructed social structure that provides a hierarchy of social roles inherited by birth with limited social mobility, which has historically resulted in restricted education, occupational, and other opportunities for groups regarded to be lower caste (Dalits) throughout their life course. Caste is repressive and discriminatory in nature, in contrast to culture, which might be regarded as a more cohesive phenomenon. In the context of this study, socially marginalized populations, such as disabled and disadvantaged caste groups (Dalit women), are less likely to utilize maternal healthcare services [5,9–11].

1.1. Disability and Maternal Healthcare Service Utilization

The UN Convention on the Rights of Persons with Disabilities (2006) defines disability as ' . . . those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others' [12]. About 15% of the world's population is estimated to have some form of disability, with a higher prevalence among women [13]. Reported rates of disability in Nepal vary widely. The Nepal census 2011 found less than 2% of the population with disabilities [6], whereas other surveys have reported prevalence rates ranging from 1 to 13% [14] and up to 29% for women with children [9,15].

Around the world, women with disabilities face numerous barriers in accessing maternal healthcare services [16–18]. Findings in Nepal are similar to those found in other low and middle-income countries [19,20]. Poor quality of care and negative health worker attitudes, physical barriers, cost and lack of family support, and poverty all are barriers faced by women with disabilities when accessing maternal healthcare services [9,21,22].

1.2. Caste and Maternal Healthcare Service Utilization

The literature demonstrates that caste has a strong influence on maternal healthcare service utilization, including the quality of care [23–25]. Dalit women endure worse health than their upper caste counterparts across almost all indicators in Nepal [26]. However, one study showed no effect of caste in the use of healthcare services [27]. The contradictory findings suggest a more complex picture and suggest that whilst caste is a factor, caste alone may not be the sole determinant in women's health indicators and in accessing healthcare services. Few papers make a direct reference to the combined issues of disability and caste. Based on the literature it can be hypothesized that the co-existence of gender discrimination together with caste and disability could have a compounding negative impact on disabled and Dalit women's maternal healthcare experiences.

1.3. Intersectionality between Disability and Caste

Intersectionality is broadly understood here as the intersection between disability and caste identity, influencing individual lives, social practices, institutional arrangements, and cultural ideologies with power outcomes [28] that ultimately impact service use by these population groups. The interactions that take place between and within multiple dimensions and power structures, and social systems, lead to various forms of oppressive experiences.

Little is known about the combined effect of disability and caste in the context of maternal health. In this study, we set out to understand whether the combined effect of

disability and caste would further compound marginalization and impact access to care by disabled women and their newborns.

This study hypothesized that healthcare services may be least accessible to disabled, disadvantaged 'Dalit women'. It also theorized that higher-caste non-disabled and disabled women have greater access to healthcare services because of their higher status in society, higher level of education, better economic status, and greater participation in and access to community resources. Further, while higher-caste disabled women's access to healthcare might be lower than that of their non-disabled peers, it was anticipated that this would still be better than that of either Dalit women or disabled Dalit women. This has implications for women in Nepal, where different forms of social oppression such as gender inequality, disability, and caste persist, despite measures to address them [29,30]. No studies to date have explored the intersection of caste and disability in the context of maternal healthcare service access and utilization in Nepal. To better understand the complex relationship between disability and caste in the utilization of maternal healthcare services, the study aims to identify the key predictors of maternal healthcare services by women with disabilities and examine whether the disability and caste identity of women affects and compounds the utilization of maternal healthcare services.

Nepal has adopted the United Nations Sustainable Development Goals (SDGs), and aspires to ensure health and wellbeing for all (SDG 3), requiring a commitment to the reduction of disparities in healthcare access, in particular for poor and marginalized communities. In speaking to that agenda, it is hoped that this study makes a contribution to the design of more equitable health policies by better informing decision-makers.

2. Method

2.1. Setting

The study was conducted in Rupandehi, a southern district of Nepal with a population of 880,196 of which 50.89% are women [6]. Just over 25% of the population are Janajati (indigenous), followed by 21% from high or advantaged Brahmin and Chhetrie caste groups, and 12% from the more disadvantaged Dalit caste groups. Only 1.12% of the district population are reported to have a disability [6].

Primary healthcare services including maternal care in the district are delivered through five primary healthcare centers (PHCC), six urban health clinics (UHC), six health posts (HP) and 58 sub-health posts (SHP). One district hospital and one zonal hospital (covering six districts) provide secondary care services. In addition to the government health services, there is a wide network of NGOs and private sector services providing private hospitals, nursing homes, clinics, and pharmacies/drug shops [31].

2.2. Study Design

A cross-sectional survey was conducted among married and unmarried women aged between 15–49 years, who had been pregnant within the last five years. Women with two or more pregnancies or deliveries were instructed to refer to their most recent pregnancy or childbirth. The sample was drawn from four different categories: Dalit and non-Dalit women with a disability, Dalit women without a disability, and non-Dalit women without a disability. While disabled and Dalit women were of particular interest in the study, non-Dalit non-disabled women were included for comparison. Women with a severe intellectual disability; those unable to provide responses; and those with a hearing impairment with whom it was not possible to communicate by verbal and or non-verbal means, such as Nepali Sign Language, were excluded from the study.

2.3. Sample

The study used a non-probability, multi-stage sampling method for selection and recruitment of participants. In the first stage, disabled women within the criteria were identified using the most recent census and with the help of local organizations of disabled people (ODPs). Out of 119 disabled women identified through census, 79 (66.4%) women

were interviewed but 30 could not be located, four did not meet the disability criteria of the UN Washington Group questionnaire (www.washingtongroup-disability.com, accessed on 13 October 2014), and six could not be interviewed due to communication difficulties. Based on the number of disabled women, the number of non-disabled Dalit and non-disabled non-Dalit women for interview was determined using a 1:2:2 ratios resulting in a total sample size of 354 for study.

2.4. The Tool and Data Collection

A semi-structured questionnaire with 95 questions covering demographics, maternal healthcare, and service utilization was adapted from previously developed standard questions used in Nepal (such as the NDHS questionnaire), with additional new questions relating to disability and empowerment. The questionnaire was field-tested, refined, and validated before use in the interviews [32]. Twelve trained woman field researchers with public health background having experience and skills in research data collection collected the data. The data was checked to ensure completeness of information; for any found incomplete, participants were revisited to complete and confirm the missing information.

3. Measures

3.1. Outcome Measures

Three measures of maternal healthcare service utilization were used: antenatal care (ANC), delivery, and postnatal care (PNC). The study considered four or more ANC visits during the last pregnancy as adequate minimum utilization [33]. Utilization for delivery was assessed as delivery in any type of officially recognized health facility-private or public birthing centers, health posts, primary healthcare centers, or hospitals. Adequate postnatal care utilization was determined as '*at least one distinct visit to a health facility for post-natal care*' made within one week of delivery. Table 1 shows the outcome measure variables, exposures, and covariates used in the study.

Table 1. Variables and their description measuring maternal healthcare service utilization.

Measure	Definition/Coding	Level of Measurement
Outcome Variables		
ANC Visit	Attendance at a health facility (HF) by a pregnant woman for antenatal care during last pregnancy (0 = < 4 visit, 1 = 4 + visit)	Binary
HF Delivery	Most recent childbirth at a health facility (HF) designated for safe delivery (0 = Home delivery, 1 = HF delivery)	Binary
PNC Visit	Attendance at a HF for postnatal care by a woman within 7 days of last childbirth (0 = No, 1 = Yes)	Binary
Exposure Variables		
Disability	Disability status of respondent women meeting Washington Group Questionnaire criteria (1 = Non-disabled, 2 = disabled)	Binary
Caste	Self-reported caste of respondent woman (1 = Dalit, 2 = Non-Dalit)	Binary
Covariates		
Place of residence	At the time of survey, respondent living in VDC are considered rural and those living in municipality are urban (1 = rural, 2 = urban)	Binary
Age	Completed age of women at the time of survey in years (1 = 15−24, 2 = 25–34, 3 = 35–49)	Categorical
Parity	Number of pregnancy or childbirths in lifetime (1 = primipara, 2 = multipara)	Binary
Respondent's education	Number of years of school education completed by the women (1 = illiterate, 2 = literate/primary education up to class 5, 3 = secondary education or above)	Categorical
Knowledge and awareness Index	Knowledge of danger signs spontaneously cited relating to pregnancy, childbirth and postpartum (An additive index) (0 = no knowledge at all, 1 = little knowledge or low level of awareness, 2 = Enough knowledge—high level of awareness)	Ordinal

Table 1. *Cont.*

Measure	Definition/Coding	Level of Measurement
Empowerment Index	An index developed using 24 questionnaire items at individual, family, and community level indicators (1 = low, 2 = medium, and 3 = high)	Ordinal
Household Wealth Index	Wealth index developed based on socio-economic indicators and household assets reported at the time of survey (1 = low, 2 = middle, and 3 = high)	Ordinal

3.2. Household Wealth Index

The household wealth index variable was constructed using 22 indicators of household possessions, resulting in a total score of 26. Household possession or dwelling characteristics were chosen from the Nepal Demographic Health Survey 2011. Except for roofing materials and source of water, all variables were dichotomized assigning the code 0 or 1. Roofing materials was assigned the weight 1 with natural/non-durable roofing materials; 2 with durable roofing materials; and 3 for long, durable roofing such as cement and concrete. Households using surface water/shallow wells were given the score 1, those using tube wells were assigned 2, and those using piped water were given 3. Women were ranked according to the score of their households. For the purpose of analysis, the lowest two and the highest two groups were collapsed to make three categories (low, medium and high) of wealth ranking.

3.3. Women's Empowerment Index

Four dimensions: economic, socio-cultural, familial/interpersonal, and political, were used to construct the women's empowerment index [34,35]. These dimensions were adapted to reflect the local context at individual/family (micro) and community (meso) level indicators, with 24 questionnaire items required to derive a score. All questionnaire items were equally weighted, and dichotomized, and a composite measure was created using the sum (maximum score of 24).

3.4. Knowledge and Awareness Index

The knowledge and awareness index was created by asking two questions. Firstly, respondents were asked: 'Are you aware of any problems that are potentially dangerous to the mother during pregnancy and childbirth?' Those who answered affirmatively were asked the second question: 'What are the danger signs to mothers during pregnancy, childbirth and after delivery?' Women who answered 'No' for the first question were given a score of 0, and women stating one to three correct danger signs to the second question were given a score of 1. Those stating four or more signs scored 2.

3.5. Statistical Analysis

Data was entered using EPI-Info version 3.4.1 and then transferred into SPSS (version 16.0 for Windows) for analysis. The associations between the measures of utilization—ante-natal care (any check-up and frequency of check-up), delivery (HF vs. home delivery), post-natal check-up (yes/no), and disability/Dalit status—were examined using cross tabulations and chi-square tests. Logistic regression analysis was carried out to test whether disability or Dalit status was related to utilization measures once socio-demographic, empowerment, and awareness characteristics of individuals had been taken into account. Confounding was investigated by multivariate analysis. Further, disability and caste were fitted separately in models and intersectionality of disability and caste was tested by inclusion of a disability*caste interaction term.

4. Results

4.1. Socio-Demographic Characteristics of Survey Participants

Table 2 shows the characteristics of survey participants. Of 354 women surveyed, 40% were non-disabled non-Dalits, about 38% were non-disabled Dalits, 17% disabled

non-Dalits, and 5% were disabled-Dalits. Over 80% participants lived in rural areas. Approximately half of the respondents were 25–34 years, 38% were 15–24 years, and the remaining were between 35–49 years of age. Nearly one-third of women reported having no education or were illiterate, and one fifth had no knowledge at all about danger signs in pregnancy. The majority of participants (56%) were primiparous. Over 19% participants were assessed as having higher levels of empowerment and autonomy—58.8% with medium levels and 21.8% with low levels. Similarly, one fifth of women were ranked as having higher levels of household wealth, 56.5% with middle levels, and 22.9% with lower levels.

Table 2. Characteristics of study participants.

Background Characteristics	*n* = 354 (%)
Participant Type	
Non-disabled non-Dalit	142 (40.1%)
Non-disabled Dalit	133 (37.6%)
Disabled non-Dalit	61 (17.2%)
Disabled Dalit	18 (5.1%)
Place of Residence	
Rural	284 (80.2%)
Urban	70 (19.8%)
Respondent's Age	
15–24 Years	134 (37.9%)
25–34 Years	172 (48.6%)
35–49 Years	48 (13.6%)
Education	
Illiterate	116 (32.8%)
Literate/primary (up to 5 Class)	117 (33.1%)
Secondary (6 class and above)	121 (34.2%)
Knowledge and Awareness	
No knowledge at all	71 (20.1%)
Little knowledge (low level of awareness)	138 (39.0%)
Enough knowledge (high level of awareness)	145 (41.0%)
Parity	
Primipara	198 (55.9%)
Multipara	156 (44.1%)
Women Empowerment Index	
Low	77 (21.8%)
Medium	208 (58.8%)
High	69 (19.5%)
Household Wealth Index	
Low (<40% in ranking)	81 (22.9%)
Middle (40–60% in ranking)	200 (56.5%)
High (>60% in ranking)	73 (20.6%)

4.2. Maternal Health Care Service Utilization

Over 73% of women had attended the recommended four or more ANC visits in their last pregnancy. Less than two-thirds of participants reported that they had a health facility (HF) delivery, and only 29% received postnatal care. Among the four groups, non-disabled non-Dalit women reported the highest percentage of utilization of all services followed by non-disabled Dalits. Disabled Dalits used ANC and HF delivery the least. However, the percentage of disabled Dalits using postnatal care services was higher than disabled non-Dalit women (28% vs. 18%). (Table 3).

Table 3. Maternal health care service utilization by different groups of study participants.

Outcome Variables	Disabled Dalit	Disabled Non-Dalit	Non-Disabled Dalit	Non-Disabled Non-Dalit	Total	*p*-Value
	n = 18	*n* = 51	*n* = 133	*n* = 142	*n* = 354	
Utilization of 4+ ANC	10 (56%)	37 (73%)	101 (76%)	111 (78%)	259 (73%)	0.136
Health Facility Delivery	9 (50%)	31 (61%)	84 (63%)	105 (74%)	229 (65%)	0.008
Utilization of PNC services	5 (28%)	9 (18%)	40 (30%)	49 (35%)	103 (29%)	0.017

Pearson Chi-square test of significance.

4.3. Bivariate Analysis Result

Table 4 illustrates that there was no significant relationship between an individual's disability and caste status and attendance for the full-recommended number of antenatal care visits ($p > 0.5$). However, education, empowerment, and household wealth factors showed some relationship with four or more ANC visits ($p < 0.05$). Compared to illiterate women, there was higher odds of four or more ANC visits with increasing levels of women's education (OR 2.27, 95% CI 1.22–4.23 for literate or primary level education; OR 3.61, 95% CI 1.84–7.08 for secondary or above education). It was also evident that women with greater levels of empowerment/autonomy had higher odds of using ANC services (OR 1.91, 95% CI 1.05–3.49 for medium, and OR 4.40, 95% CI 1.74–11.10 for high level empowerment). Additionally, women with higher household wealth index (OR 1.98, 95% CI 1.05–3.72) were more likely to receive the full 4 ANC services than those from households with a low index.

Table 4. Bivariate analysis.

Variables	ANC (4+)			HF Delivery			PNC (At Least 1)		
	OR	95% CI	*p*-Value	OR	95% CI	*p*-Value	OR	95% CI	*p*-Value
Disability									
Non-disabled	1			1			1		
Disabled	0.63	(0.34−1.16)	0.138	0.50	(0.30−0.84)	0.009	0.47	(0.25−0.88)	0.019
Caste									
Non-Dalit	1			1			1		
Dalit	0.81	(0.48−1.37)	0.440	0.77	(0.49−1.20)	0.243	0.93	(0.60−1.52)	0.839
Place of Residence									
Rural	1			1			1		
Urban	1.92	(0.90−4.09)	0.093	2.02	(1.10−3.72)	0.023	0.54	(0.28−1.01)	0.056
Age									
15–24 years	1			1			1		
25–34 years	0.64	(0.36−1.14)	0.127	0.42	(0.25−0.71)	0.001	1.03	(0.63−1.69)	0.896
35–49 years	0.48	(0.21−1.12)	0.088	0.21	(0.10−0.42)	0.000	0.44	(0.19−1.03)	0.059
Education									
Illiterate	1			1			1		
Primary Education	2.27	(1.22−4.23)	0.010	2.27	(1.34−3.84)	0.002	1.54	(0.86−2.77)	0.150
Secondary or higher	3.61	(1.84−7.08)	0.000	14.63	(6.94−30.83)	0.000	1.87	(1.05−3.33)	0.034
Parity									
Primi	1			1			1		
Multi	0.60	(0.35−1.01)	0.054	0.23	(0.14−0.36)	0.000	0.54	(0.33−0.86)	0.011
Knowledge & awareness									
No knowledge	1			1			1		
Little	1.07	(0.53−2.14)	0.859	1.04	(0.58−1.87)	0.891	0.87	(0.45−1.65)	0.663
Enough	1.51	(0.74−3.06)	0.258	2.05	(1.12−3.75)	0.020	1.25	(0.67−2.33)	0.483
Empowerment									
Low	1			1			1		
Medium	1.91	(1.05−3.49)	0.034	1.04	(0.60−1.80)	0.887	1.01	(0.56−1.82)	0.980
High	4.40	(1.74−11.10)	0.002	1.69	(0.83−3.44)	0.150	1.37	(0.68−2.78)	0.381
Household Wealth									
Low	1			1			1		
Middle	1.98	(1.05−3.72)	0.034	2.76	(1.62−4.70)	0.000	1.50	(0.82−2.75)	0.191
High	1.63	(0.76−3.47)	0.208	5.84	(2.77−12.30)	0.000	1.83	(0.90−3.74)	0.097

The respondents' disability status showed significant associations with health facility delivery ($p < 0.05$), whereas the respondent's caste did not show any association ($p > 0.05$). The odds of health facility delivery for disabled non-Dalit and disabled Dalits women was 60% (OR 0.40, 95% CI 0.21–0.77) and 65% (OR 0.35, 95% CI 0.13–0.96) lower, respectively, than non-disabled non-Dalits. Urban women were also twice as likely to have a HF delivery compared to rural women (OR 2.02, 95% CI 1.10–3.72).

Women's education, age, and parity were strong factors influencing whether to deliver at home or HF. Women with secondary level or higher education had greater odds than those who were illiterate or had no education (OR 14.63, 95% CI 6.94–30.83). The odds ratio of HF delivery for the women age between 25–34 years was 0.42, 95% CI 0.25–0.71; and 35–49 years had OR 0.21, 95% CI 0.10–0.42. Multiparous women had lower odds (OR 0.23, 95% CI 0.14–0.36) than primiparous. Women's knowledge and awareness of pregnancy danger signs and household wealth were also found to be strong predictors for giving birth at a health facility (OR 2.05, 95% CI 1.12–3.75 for adequate knowledge and awareness and OR 5.84, 95% CI 2.77–12.30 for highest wealth ranking groups). (Table 4).

Women's disability and some socio-demographic factors such as respondent's education, age at marriage, and parity were associated with PNC service utilization ($p < 0.05$). Women with secondary or higher education had greater odds (OR 1.87, 95% CI1.05–3.33) of utilizing PNC services than those with no education. Women with two or more pregnancies were 50% less likely to use PNC than those with their first pregnancy (OR 0.54, 95% CI 0.33–0.86). No relationship was found between the respondent's caste and PNC service utilization ($p > 0.05$) (Table 4).

4.4. Multi-Variate Analysis

Table 5 shows odds ratios for disability status with all three service utilization outcomes, adjusted for socio-demographic and household factors theorized to be a potential confounders of associations. Overall, disabled respondents reported less odds of utilization in all three outcomes, compared to non-disabled. In the unadjusted model, there was no association between disability and the four recommended ANC visits. After adjusting for potential confounding variables, the data did not show a significant relationship between disability and ANC visits.

Disabled women had lower odds of HF delivery (OR 0.48, 95% CI 0.26–0.86) and PNC (OR 0.47, 95% CI 0.25–0.88) compared to non-disabled women. However, after adjustment for women's age, there was no association between disability and HF delivery. Adjustment for place of residence (location) and parity reduced the association. In the full model, there was not a significant association between disability and HF delivery. The same group of confounders affected the relationship between disability and PNC in the same way as in HF delivery.

Tables 6 and 7 show the models with interaction terms that look at the effect of interactions between exposures and key predictors of service utilization, including age, education, parity, and wealth factors, and their association in utilization for disabled and non-disabled, and Dalit and non-Dalit, women. Given the data, in most cases there was insufficient evidence of interaction effect between disability and women's age, education, parity, and household wealth at 5% significant level (Table 6). However, a weak interaction effect in the utilization of recommended ANC services found in the caste group by their education (OR 0.19, 95% CI 0.05–0.74). (Table 7).

Table 5. Unadjusted and adjusted odds ratio of disability with maternal health care utilization.

Factors	ANC 4+ Visit		HF Delivery		PNC Visit	
	OR	95% CI	OR	95% CI	OR	95% CI
Disability Only	0.63	0.34–1.16	* 0.48	0.26–0.86	* 0.47	0.25–0.88
Disability + Caste	0.58	0.31–1.09	** 0.45	0.26–0.77	* 0.46	0.24–0.88
Non-Dalit	1		1		1	
Dalit	0.74	0.43–1.27	0.66	0.41–1.05	0.93	0.58–1.50
Disability + Education	0.68	0.36–1.28	* 0.54	0.32–0.91	* 0.46	0.26–0.92
Illiterate/no education	1		1		1	
Primary education	* 2.18	1.17–4.08	** 2.12	1.25–3.61	1.44	0.79–2.60
Secondary or higher	*** 3.55	1.81–6.98	*** 14.73	6.94–31.26	* 1.81	1.01–3.24
Disability + Location			* 0.54	0.32–0.91		
Rural			1			
Urban			* 1.85	1.01–3.43		
Disability + Women's Age			0.72	0.41–1.26		
15–24 yrs			1			
25–34 yrs			** 0.44	0.26–0.74		
35–49 yrs			*** 0.25	0.12–0.52		
Disability + Parity			* 0.61	0.35–1.06	* 0.52	0.27–0.98
Primi			1		1	
Multi			*** 0.24	0.15–0.39	* 0.58	0.35–0.93
Disability + Knowledge/Awareness			* 0.54	0.32–0.91		
No knowledge			1			
Little			1.00	0.55–1.81		
Enough			* 1.89	1.02–3.48		
Disability + Empowerment	0.64	0.34–1.19				
Low	1					
Medium	* 1.91	1.05–3.49				
High	** 4.37	1.23–11.05				
Disability + Wealth Index	0.70	0.37–1.31	0.68	0.39–1.19		
Low	1		1			
Middle	1.85	0.98–3.52	** 2.54	1.47–4.39		
High	1.48	0.68–3.23	*** 5.21	2.43–11.17		
Full Model	0.71	0.37–1.38	0.76	0.38–1.50	* 0.52	0.27–0.99

* $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

Table 6. Models with interaction terms analyzing the effects of interactions between key predictors and service utilization by disability.

Predictors	ANC4+			HF Delivery			PNC		
	OR	95% CI	*p* Value	OR	95% CI	*p* Value	OR	95% CI	*p* Value
Disability + Age									
Disabled	0.83	0.20–3.43	0.800	0.65	0.20–2.06	0.462	1.23	0.26–5.88	0.794
Non-disabled									
Age									
15–24 years	2.02	0.65–6.34	0.226	4.41	1.64–11.88	0.003	2.98	0.83–10.76	0.096
25–34 years	1.27	0.42–3.85	0.674	1.55	0.60–3.97	0.364	2.83	0.79–10.18	0.110
35–49 years									
Disabled									
15–24 years	0.61	0.08–4.50	0.626	0.41	0.08–2.15	0.290	0	0	0.999
25–34 years	0.95	0.18–4.89	0.947	1.69	0.42–6.79	0.459	0.56	0.10–3.31	0.524
35–49 years									
Disability + Education									
Disabled	0.71	0.29–1.76	0.462	0.63	0.27–1.48	0.292	0.27	0.08–0.99	0.048
Non-disabled									
Education									
Illiterate									
Primary education	1.94	0.97–3.85	0.060	2.28	1.25–4.14	0.007	1.29	0.68–2.44	0.440
Secondary and above	4.58	1.99–10.53	0.000	21.06	7.76–57.17	0.000	1.56	0.82–2.95	0.176

Table 6. *Cont.*

Predictors	ANC4+			HF Delivery			PNC		
	OR	95% CI	*p* Value	OR	95% CI	*p* Value	OR	95% CI	*p* Value
Disabled									
Illiterate									
Primary education	2.49	0.41–15.11	0.323	0.75	0.21–2.78	0.671	2.01	0.35–11.45	0.434
Secondary and above	0.45	0.10–1.84	0.253	0.36	0.08–1.76	0.208	2.42	0.48–12.07	0.282
Disability + Parity									
Disabled	0.67	0.29–1.52	0.334	0.58	0.28–1.17	0.126	0.44	0.17–1.13	0.089
Non-disabled									
Parity									
Primipara	1.60	0.87–2.91	0.129	4.03	2.35–6.92	0.000	1.65	0.97–2.80	0.065
Multipara									
Disabled									
Primipara	1.03	0.30–3.60	0.963	1.17	0.38–3.67	0.783	1.37	0.38–4.99	0.631
Multipara									
Disability + Wealth									
Disabled	0.82	0.15–4.54	0.823	1.36	0.15–12.36	0.786	0.73	0.13–4.07	0.720
Non-disabled									
Wealth Index									
Low-wealth group	0.80	0.32–1.97	0.626	0.26	0.11–0.60	0.002	0.70	0.31–1.58	0.389
Middle-wealth group	1.22	0.60–2.50	0.584	0.49	0.24–1.01	0.050	0.89	0.49–1.63	0.700
High-wealth group									
Disabled									
Low-wealth group	0.58	0.08–4.36	0.600	0.28	0.03–3.10	0.301	0.64	0.08–5.04	0.671
Middle-wealth group	1.05	0.15–7.33	0.958	0.68	0.07–7.01	0.743	0.68	0.10–4.70	0.695
High-wealth group									

Table 7. Models with interaction terms analyzing the effects of interactions between key predictors and service utilization by caste.

Predictors	ANC4+			HF Delivery			PNC		
	OR	95% CI	*p* Value	OR	95% CI	*p* Value	OR	95% CI	*p* Value
Caste + Age									
Dalit	3.11	0.67–14.44	0.147	1.28	0.40–4.09	0.683	0.32	0.07–1.56	0.159
Non-Dalit									
Age									
15–24 years	5.00	1.57–15.94	0.007	6.10	2.35–15.84	0.000	1.30	0.41–4.12	0.653
25–34 years	2.30	0.84–6.34	0.106	2.83	1.22–6.60	0.016	1.17	0.37–3.67	0.792
35–49 years									
Dalit									
15–24 years	0.15	0.02–0.89	0.037	0.58	0.14–2.45	0.460	2.91	0.51–16.53	0.228
25–34 years	0.25	0.05–1.38	0.112	0.44	0.12–1.66	0.226	3.71	0.67–20.47	0.132
35–49 years									
Caste + Education									
Dalit	1.79	0.79–4.05	0.161	1.01	0.48–2.11	0.990	1.14	0.47–2.76	0.769
Non-Dalit									
Education									
Illiterate									
Primary education	3.66	1.45–9.23	0.006	2.06	0.99–4.28	0.054	1.91	0.82–4.46	0.135
Secondary and above	7.27	2.84–18.62	0.000	20.83	7.42–58.46	0.000	2.11	0.81–5.46	0.125
Dalit									
Illiterate									
Primary Education	0.38	0.11–1.37	0.140	1.21	0.42–3.46	0.727	0.64	0.20–2.10	0.463
Secondary and above	0.19	0.05–0.74	0.017	0.41	0.09–1.83	0.240	0.82	0.25–2.73	0.745
Caste + Parity									
Dalit	1.32	0.63–2.78	0.469	1.11	0.59–2.09	0.736	1.01	0.48–2.14	0.984
Non-Dalit									
Parity									
Primipara	2.36	1.14–4.89	0.020	5.14	2.72–9.75	0.000	1.71	0.89–3.31	0.108
Multipara									

Table 7. *Cont.*

Predictors	ANC4+			HF Delivery			PNC		
	OR	95% CI	*p* Value	OR	95% CI	*p* Value	OR	95% CI	*p* Value
Dalit									
Primipara	0.46	0.16–1.32	0.147	0.69	0.27–1.79	0.446	1.26	0.48–3.32	0.638
Multipara									
Caste + Wealth									
Dalit	0.77	0.24–2.44	0.656	0.76	0.22–2.64	0.665	1.20	0.43–3.33	0.726
Non-Dalit									
Wealth Index									
Low-wealth group	0.73	0.24–2.21	0.581	0.13	0.05–0.35	0.000	0.77	0.30–1.98	0.586
Middle-wealth group	1.09	0.47–2.52	0.847	0.48	0.21–1.14	0.096	0.76	0.37–1.57	0.462
High-wealth group									
Dalit									
Low-wealth group	0.85	0.17–4.11	0.835	1.89	0.41–8.73	0.416	0.48	0.11–2.10	0.330
Middle-wealth group	1.37	0.35–5.39	0.652	1.00	0.25–3.97	0.997	1.13	0.35–3.73	0.836
High-wealth group									

5. Discussion

This study found that disabled women used all maternal healthcare services less than non-disabled women of all castes. The results suggest that it is the disability status of pregnant Nepali women and not their caste that contributes to the utilization of health facility delivery and postnatal care. Associations between disability and all three maternal healthcare utilization outcomes were entirely explained by the inclusion of education and household wealth, suggesting that the main reasons why disabled women were less likely to utilize maternal healthcare services was due to social and household circumstances.

There are few statistics available to compare the findings of this study within Nepal as the government has limited mechanisms for recording disability data, and most previous studies on maternal healthcare have not included disability. The few qualitative studies conducted in this field in Nepal indicate poor utilization of services by women with disabilities during their pregnancy and childbirth [9,15]. This contrasts with findings from high-income countries, where a more structured and intensive approach to pregnancy care for women with disabilities may be offered within well-developed health systems [18].

There was no evidence of effect modification by the women's caste status. There have been long-standing and highly politicized concerns that major caste-dependent differences remain, with lower maternal healthcare utilization among Dalits consistently reported in the literature [36–41]. Increases in public awareness and policy developments resulting from these concerns may have contributed to changes in social equity and improvements in utilization across caste groups, so it is possible that differences in service utilization resulting from caste-based factors [27] could have improved in response to activism and policy attention to this disparity.

Another finding that should generate additional research in the future is the fact that disabled women from non-Dalit households were less likely to get care than either disabled women from Dalit households or non-disabled, non-Dalit women. Our sample size is admittedly small, but this finding raises the question of what is going on with these disabled women. They are members of households that presumably have more access to resources, including funds for education, healthcare, and transportation that should allow them equal access to maternal healthcare as their non-disabled non-Dalit peers. However, that presumes that household resources are shared equally, and we know that people with disabilities sometimes are not allowed equal access within households. Rising expectations in more prosperous non-Dalit households may also make the presence of disabled women and their call on household resources more rather than less problematic.

The study identified a number of individual, socio-demographic, and family-related factors associated with maternal healthcare service utilization by women with disabilities. Parity was associated with increased likelihood of health facility delivery if it was a first

birth, corresponding with previous studies in Nepal [42,43]. First-time mothers may perceive more risks due to a lack of prior childbirth experience or may have other anxieties stemming from a lack of reliable information.

Women's level of education and their knowledge and awareness were also strong predictors for utilization of services, with better educated women more likely to give birth at a HF and to receive PNC services, consistent with other's findings [44–47]. Educated women may have a greater understanding of the benefits of using services, as well as the autonomy and confidence to use them. Education may also increase women's status in their family, enabling greater self-determination to choose and access services more easily [48]. Disabled women, both Dalit and non-Dalit, consistently had less education than their non-disabled peers, and this may be an important explanatory factor for why disabled women utilized services less.

The samples available for analysis in this study were small for the complexity of the phenomena. This means that whilst directional, the findings should be treated with caution. However, they indicate that further studies with larger samples and more in-depth qualitative analysis would be justified.

Limitations of the Study

We acknowledge several constraints and limitations. This research was a part of a Safe Motherhood Project in southern Nepal; therefore, the study population was limited to the project district. Secondly, having a very specific 'hard to reach' population for the study, with narrow inclusion criteria (i.e., Dalit and women with disability having had at least one pregnancy between 2009 and 2014), limited the sample size. Furthermore, the small and disproportionate sample size had implications for data analysis, forcing the researchers to employ a logical collapse of the variables where possible to measure associations with other variables or outcomes. In several circumstances, the tests for association were calculated with a small figure, which may have implications for accuracy. Given the large number of comparisons made in the quantitative section, significant associations close to the 0.05 level should be interpreted with caution, as 1 in 20 tests may have a p-value below 0.05 purely due to chance [49]. However, consistent relationships were seen between disability status and some maternal healthcare outcomes, suggesting that at least for disability status, findings are robust.

Language and communication barriers were another prominent constraint in the study. They was mostly overcome by recruiting local research assistants and using a questionnaire translated into the local languages (Nepali and Bhojpuri). However, the need to exclude women with the most severe communication disabilities limits the capturing of the experiences of these women.

An additional limitation is that for the purposes of this study, we used the broad definition of 'disability' from the United Nations Convention on the Rights of Persons with Disabilities [12]. However, there are a range of factors related to the type and severity of disability that may lead to varying access to and experiences with the health services. More detailed studies in future are needed to better understand these variables between groups of disabled women.

6. Conclusions

The results of this study suggest that the disability status of pregnant Nepali women is a more powerful factor in limiting the utilization of health facility delivery and postnatal care than is caste. Associations between disability and maternal healthcare utilization outcomes appear to be explained by socio-demographic factors. Except for a weak effect modification by education in the utilization of four recommended ANC services by Dalits, there was no evidence of effect modification in the utilization of services by women's caste. The findings of this study suggest that more substantive quantitative and qualitative studies are warranted, and that policy and political discourse should be widened, to acknowledge and address the disparities and challenges faced by women with disabilities of all castes.

Abbreviations

ANC	Antenatal Care
BLF	Big Lottery Fund
CI	Confidence Interval
DPO	Disabled Person's Organization
HF	Health Facility
NDHS	Nepal Demographic Health Survey
NGO	Non-Governmental Organization
OR	Odds Ratio
PNC	Post-Natal Care
UN	United Nations.

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