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Factors Associated with Antenatal Care Visit Dropout among Mothers attending Immunization Clinic

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ABSTRACT

Introduction

Developing nations continue to have high maternal mortality rates. Prenatal care helps to improve the mother's and the unborn child's health. The purpose of this study was to identify the variables linked to mothers' antenatal care visit droput.

Methods

A cross-sectional study was carried out using the multi-stage sampling technique in the four urban and four rural randomly chosen municipalities of Morang district. In total, 134 postnatal mothers who skipped four focused ANC visits were chosen as study group and 266 postnatal mothers who completed four focused ANC visit from the same vaccination facilities were chosen as control group. Using a semi-structured questionnaire and the consecutive sampling approach, data were gathered through interviews. The final model was chosen by employing the backward elimination technique after doing bivariate and multivariate analysis.

Results

This study found that the majority (56.0%) of cases was from the age group of 21-30 years and 35.1% of cases were janajatis. The number of factors were linked to ANC dropout, including age (OR 2.49, 95% CI 1.07-5.82), ethnicity (OR 2.29, 95% CI 1.05-4.99), education (OR 4.64, 95% CI 1.99- 10.81), income (OR 3.49, 95% CI 1.75- 6.95), and the existence of complications (OR 1.15, 95% CI 0.54-2.44).

Conclusion

The risk factors for ANC dropout were age, ethnicity, education, income, and the presence of complications during previous pregnancy. It suggests that efforts should be made to spread the information about the value of four focused ANC visits.

Keywords

ANC dropout, factors, immunization center, mothers

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INTRODUCTION

A preventive measure to lower maternal mortality is antenatal care (ANC). To achieve high excellence of care all throughout pregnancy and childbirth, the World Health Organization (WHO) has recommended total eight ANC visits as routine prenatal care, though Nepal currently uses model of 4 ANC visits at 4, 6, 8 and 9 months.[1] Globally 87% of pregnant women receive first antenatal visit and among them 60% complete four ANC visit.[2] In Nepal, 84% of pregnant mothers utilize ANC services, however, the recommended four visits as per national protocol are low.[3] In Nepal, 76.3% did first visit at four month and only 58.8%completed fourth visit.This shows significant(18%) dropout in ANC visits.[4]

Various factors affect utilization of ANCservices such as socio-demographic, topographical, financial, religious, health system availability. Likewise, elder age, greaterparity, education status, economic status, unanticipated pregnancy, difficult previous pregnancies, spouse's support and distance to health facility are significant for ANC visits.[5-7]

In the research area, there are little findings about why women did not use the advised subsequent ANC visit. This study wil help indepth understanding of factors of ANC dropout and helps to develop strategies to overcome these factors. Hence the aim of this study was to explore the factors associated with ante-natal care visit dropout among mothers.

METHODS

In this cross-sectional study, the particpants were all postnatal mothers attending immunization clinic. The study was conducted in Morang District. Postnatal mothers who skipped four or more focused ANC visits were chosen as study group (cases) and those mothers who completed at least four focused ANC visit from the same vaccination facilities were chosen as control group (controls).

Multistage sampling technique was used. Stage I: Morang district consists of one metropolitan, eight urban municipalities and eight rural municipalities. Metropolitan city was excluded from the study in order to reduce the variation of sample. Among municipalities, four urban and four rural municipalities were selected randomly. Stage II: From each selected municipality, two immunization centers were selected randomly. StageIII: Twenty-six postnatal mothers attending selected immunization center was taken as sample by consecutive sampling technique.

Based on Singh et al[8], the sample size was estimated by taking the primary reason for ANC dropout into account i.e. educations of the women (OR= 2.22; 95% CI= 1.264-3.917) with the power of study assumed to be 90% at 95% CL, case: control ratio being 1:2, proportion of control exposed being 35.57%.[8] Thus, using the Epi-tools online (https://epitools.ausvet.com.au/casecontrolss, Mon June 21, 2021), the ultimate sample size was 400 mothers, comprising of 134 participants in study group and 266 participants in control group.

Data were gathered through interviews with the aid of a self-developed semi-structured questionnaire. The questionnaire was divided into three distinct parts i.e. Part I: Predisposing and external environment related factors were included in this part, Part II: Enabling and need factors will be included in this part and Part III: ANC service utilization related factors for assessing dropout was included in this part.

The study was ethically approved by IRC IoM ((ref no. 467(6-11) E2 077/078). Information was collected from the eligible women after obtaining the informed consent. Participation was voluntary and they had freedom to discontinue at any point during data collection without any penalty. Interview was done by maintaining the confidentiality and privacy from July to September, 2021. Principal investigators along with co-investigators were involved in data collection process. Data was entered and analyzed using SPSS Version 16.0 (SPSS Inc., Chicago III, USA). The probability of the difference between study and control groups occurring by chance was tested by means of chi-square test. Binary logistic regression was done to analyze the factors associated with ANC dropout by calculating the odds ratio (OR) with 95% confidence interval (CIs). Observed associations were assessed through multivariate logistic regression. All variables with a P-value ≤ 0.10 in bivariate analysis were included in the multivariate logistic regression model. Backward elimination strategy was used to select variables for the final model. The probability of removal was set at P = 0.05.

RESULTS

Majority of cases (85.8%) and controls (91.4%) of were Hindu, while the age bracket of the majority of cases (56.0%) and controls (71.1%) were 21 to 30 years. By ethnicity, Janajati made up the most (35.1% cases and 32% controls), while Newar made up the least (2.2% cases and 4.9% controls). Similar to this, 28.4% of cases and 6.8%of controls were illiterate, whereas 29.1% of cases and 50.4% of controls had completed secondary education. Similarly, over two-thirds of cases (80.6%) and controls (72.2%) were housewives, and roughly the same percentages of rural inhabitants (88.8% cases and 80.5% controls) were also housewives. Only 14.3% of the controls and around half of the patients (43.3%) had income sufficient to fulfil basic needs for six months

Table 1. Obstetric characteristics of the study participants

Variables	Case (n=134) (%)	Control (n=266) (%)	Total (n=400) (%)
Birth order of current pregnancy			
1	66(50.0%)	119(44.7%)	184(46.0%)
2	47(35.1%)	112(42.1%)	159(39.8%)
≥ 3	20(14.9%)	35(13.2%)	57(14.2%)
Gravida			
1	67(50.0%)	117(44.0%)	184(46.0%)
2	47(35.1%)	112(42.1%)	159(39.8%)
≥ 3	20(14.9%)	37(13.9%)	57(14.2%)
Knowledge on danger sign			
Yes	45(33.6%)	155(58.3%)	200(50.0%)
No	89(66.4%)	111(41.8%)	200(50.0%)
Complication during previous pregnancy			
Yes	10(7.5%)	45(16.9%)	55(13.8%)
No	124(92.5%)	221(83.1%)	345(86.2%)
Distance to health facility			
<30 min	92(68.7%)	214(80.5%)	306(76.5%)
>30 min	42(31.3%)	52(19.6%)	94(23.5%)
Health facility for ANC Visit			
Private	22(16.4%)	41(15.4%)	63(15.8%)
Public	112(83.6%)	225(84.6%)	337(84.2%)
Frequency of ANC visit done (current pregnancy)			
One	22(16.4%)		22(5.5%)
Two	70(52.2%)		70(17.5%)
Three	42(31.3%)		42(10.5%)
Four or more	-	266(100%)	266(66.5%)
Opinion on number of ANC visit required			
1	3(2.2%)	-	3(0.8%)
2	1(0.7%)	1(0.4%)	2(0.5%)
3	1(0.7%)	9(3.4%)	10(2.5%)
>4	57(42.5%)	241(90.6%)	298(74.5%)
No idea	72(53.7%)	15(5.6%)	87(21.8%)
Current pregnancy			
Wanted	130(97.0%)	258(97.0%)	388(97.0%)
Not wanted/Unplanned	4(3.0%)	8(3.1%)	12(3.0%)
Decision makerin family			
Self	3(2.2%)	16(6.0%)	19(4.8%)
Husband	39(29.1%)	35(13.2%)	74(18.3%)
Husband and wife	82(61.2%)	197(74.10%)	279(69.8%)
Others	10(7.5%)	18(6.8%)	28(7.0%)

Table 2. Reasons for ANC dropout

Reasons	Frequency (%)
No permission for ANC visit from family	47 (35.1%)
Inadequate financial support	96(71.6%)
Fear of being alone for check up	64 (47.8%)
Distance to health facility	34(25.4%)
Staff unavailability at the time of ANC visit	35(26.1%)
Unsatisfactory ANC counseling	14(10.4%)
Comfortability in seeking care	1(0.7%)

Table 3. Demographic factors associated with ANC dropout (bivariate analysis)

Factors	Case (n=134) %	Control (n=266) %	OR	CI	p value
Age					
≤20	42(10.5%)	41 (10.2%)	2.16	1.05-4.45	0.03*
21-30	75(18.8%)	189(47.2%)	.84	0.44-1.58	0.59
≥31	17(4.2%)	36(9.0%)	(Ref)		
Religion					
Hindu	115(28.8%)	243(60.8%)	0.57	0.30-1.09	0.09
Others #	19(4.8%)	23(5.8%)	(Ref)		
Ethnicity					
Brahmin chetri	13(3.2%)	65(16.2%)	(Ref)		
Tarai Madhesi #	44(11.0%)	63(15.80%)	3.49	1.71-7.09	0.00*
Dalit	27(6.8%)	40(10.0%)	3.37	1.56-7.28	0.00*
Janajati ##	50(12.5%)	98(24.5%)	2.55	1.28-5.06	0.00*
Education					
Illiterate	38(9.5%)	18(4.5%)	7.64	3.64-16.01	0.00*
Primary	36(9.0%)	38(9.3%)	3.42	1.76-6.66	0.00*
Secondary	39(9.8%)	134(33.3%)	1.05	0.57-1.92	0.86
Higher secondary and above	21(5.2%)	76(19.0%)	(Ref)		
Husbands' education					
Illiterate	15(3.8%)	26(6.5%)	6.27	2.82-13.93	0.00*
Primary	39(9.8%)	37(9.3%)	3.43	1.77-6.64	0.00*
Secondary	136(34.0%)	50(12.5%)	1.33	0.74-2.38	0.33
Higher secondary and above	76(19.0%)	21(5.3%)	(Ref)		
Occupation					
Home maker	108(27.0%)	192(48.0%)	1.60	0.96-2.65	0.06
Others #	26(6.5%)	74(18.5%)	(Ref)		
Husband's Occupation					
Farmer	96(24.0%)	149(32.7%)	0.63	0.27-1.48	0.29
Buiseness	15(3.8%)	62(15.5%)	1.68	0.84-3.35	0.13
Service	13(3.2%)	34(8.5%)	1.24	0.46-3.34	0.66
Others #	10(2.5%)	21(5.2%)	(Ref)		
Place of residence					
Rural	119(29.8%)	214(53.5%)	0.51	0.28-0.96	0.03*
Urban	52(13.0%)	52(13.0%)	(Ref)		
Income					
Enough for 6 months	58(43.3%)	38(14.3%)	6.99	3.83-12.77	0.00*
Enough for 1 year	52(38.8%)	118(44.4%)	2.02	1.16-3.49	0.01
Adequate for 1 year for saving	24(17.9%)	110(41.4%)	(Ref)		

Table 1 depicts that nearly half of cases (50%) and less than half of controls were primi- gravida mother. One third of cases (33.6%) were aware about danger sign of pregnancy, compared to controls (58.3%). Similarly, only 7.5% cases had complications during previous pregnancy in comparison to controls (16.9%). About one-third case mothers (31.3%) had nearest health facility at a walking distance of more than 30 minutes in compared to controls (19.6%). Majority of cases (83.6%) and control (84.6%) mothers had done their ANC visit in public health facility and almost all (97%) had wanted pregnancy. Fewer mothers (2.2%, 6%) were involved in decision-making about seeking health care.

Table 2 states that majority of cases (71.6%)lacked adequate financial support, 47.8% expressed fear of visiting the health intuition alone, 35.1% did not receive permission from their families to have an ANC checkup, one fourth 26.1% reported staff unavailability during ANC visit and 25.4% reported difficulty traveling to the hospital. Few (10.4%) of cases mentioned that the ANC counseling was inadequate.

Table 3 states that insignificant associations were

Table 4. Obstetric factors associated with ANC dropout (bivariateanalysis)

Factors	Case (n=134)(%)	Control (n=266)(%)	Unadjusted OR	CI	p value
Birth order of current pregnancy					
1	66(50.0%)	119(44.7) %	0.98	0.52-1.84	0.96
2	47(35.1%)	112(42.1%)	0.73	0.38-1.40	0.34
≥ 3	20(14.9%)	35(13.2%)	(Ref)		
Gravida					
1	67(50.0%)	117(44.0%)	1.05	0.56-1.97	0.86
2	47(35.1%)	112(42.1%)	0.77	0.40-1.4	0.43
≥3	20(14.9%)	37(13.9%)	(Ref)		
Knowledge on Danger sign					
Yes	45(33.6%)	155(58.3%)	2.7	1.79-4.26	0.00*
No	89(66.4%)	111(41.8%)	(Ref)		
Complication during previous pregnancy					
Yes	10(7.5%)	45 (16.9%)	2.52	1.22-5.18	0.01*
No	124(92.5%)	221(83.1%)	(Ref)		
Distance to health facility					
<30 min	92(68.7%)	214(80.5%)	0.53	0.33-0.85	0.00*
>30 min	42(31.3%)	52(19.6%)	(Ref)		
Health facility for ANC Visit					
Private	22(16.4%)	41(15.4%)	1.07	0.61-1.89	0.79
Public	112(83.6) %	225(84.6%)	(Ref)		

identified between independent factors including religion, occupation, and husband's occupation. While it wasdiscovered thatethnicity, education of the respondent and her husband, place of residence, and their income were all significant factors. Regarding age, respondents under the age of 20 had a two-fold higher chance of dropping out of ANC than respondents who were at least thirty-one years old (OR 0.840, CI 0.445-1.587). Similar to Brahmin/Chhetri, Terai/Madhesi was three times as likely to leave the ANC as those two groups. Likewise, illiterate were seven times more likely to ANC dropout in comparison to respondents with higher secondary and above education (OR 7.640, CI 3.644-16.017). In addition, those with illiterate husbands were sixtimes more likely to ANC dropout. Respondents' place of residence, rural areas have 13.0% lower probability of ANC dropout than urban areas (OR 0.519, CI 0.280-0.961). Also, respondents with family incomes sufficient for six months are six times more likelyto discontinue ANC than those with income sufficient for a year of saving (OR 6.996, CI 3.832-12.771).

Table 4 shows the association between obstetric factors and ANC dropout. The association between the independent variables such as birth order, gravida, and ANC visit were found to be insignificant. However, there seemed to be significant association when comparing case and control with knowledge of danger sign, complication, and distance to health facility and decision making.Mother, who did not have knowledgeon danger signs were 66.4% higher for ANC dropout than who have knowledge (1.790-4.260). Similarly, the respondents who did not have complications in their pregnancy were more likely for ANC dropout than other. Regarding, distance to health facility the odds for ANC dropout in more than 30-minute distance was 31.3% less with 30-minute distance (0.331-0.855). The respondents who can make self-decision were less likely for ANC dropout than other.

Table 5 depicts that age of mother and ANC dropout is related (OR 2.499, CI 1.072-5.824). Mothers under the age of 20 had a 2.49 times greater risk of having their ANC services discontinued than mothers over the age of 30. The odds ratio of 2.29 (CI 1.052-4.994, P-0.037) among Tarai/Madhesi and Janajati (OR2.27, CI 1.083-4.757) indicates that mothers of these two ethnic groups were more likely to dropout of the ANC than Brahmins/Chhetri.

Education is associated with ANC dropout (OR 4.642 (illiterate), 2.42 (primary), CI 1.002-10.817, 1.165-5.030). Literacy remained protective factor as the mothers who were literate were 95% less likely to ANC dropout than illiterate. The association with income is significant with ANC dropout (OR3.496, CI 1.758-6.954). The mothers whose family income was enough for only six months were 3.496 times more likely to ANC dropout than family income adequate for one year for saving. Presence of complications is associated with ANC dropout

Table 5. Factors Associated with ANC dropout (multivariate analysis)

Factors	Unadjusted OR	Adjusted OR†	95 % CI‡	p value
Age of Mother				
<20	2.16	2.49	1.07-5.82	0.03
20-30	0.84	1.15	0.54-2.44	0.70
≥31	(Ref)			
Ethnicity				
Brahmin/chetri	(Ref)			
Tarai Madhesi	3.49	2.29	1.05-4.99	0.03
Dalit	3.37	1.55	0.64-3.74	0.32
Janajati	2.55	2.27	1.08-4.75	0.03
Education				
Illiterate	7.64	4.64	1.99-10.81	0.00
Primary	3.42	2.42	1.16-5.03	0.01
Secondary	1.05	0.82	0.43-1.55	0.55
Higher secondary and above	(Ref)			
Income				
Enough for 6 months	6.99	3.49	1.75-6.95	0.00
Enough for 1 year	2.02	1.25	0.68-2.29	0.45
Adequate for 1 year for saving	(Ref)			
Complications during previous pregnancy				
Yes	2.52	1.15	0.54-2.44	0.00
No	(Ref)			

(OR 1.155, CI 0.546- 2.440) which reflects that respondents who developed complications during pregnancy had ANC dropout.

DISCUSSION

The majority the case (56.0%) and control (71.1%) participants in this study were between the ages of 21 and 30.The results were greater than those of the study conducted in the Bahir Dar Zuria Woreda community, with respondents in the cases and controls reporting (31.4%) and (32.3%) respectively.[10] This could be as a result of the high fertility rate in this age range and the fact that nearly half of marriages happen between the ages of 20 and 24.[15]

Regarding ethnicity, Janajati made up 35.1% of patients and 32% of controls, while relatively advantageous Janajati (Newar) made up 2.2% of cases and 4.9% of controls, which is comparable with the findings of earlier studies conducted in Nepal.[13] Similarly, fourteen percentage of total participants were illiterate and 29.1% cases and 50.4% control mothers had achieved secondary education as shown by various studies done in Nepal with higher percentage of literate women[14,16] whereas many studies showed higher percentage of illiterate mothers.[10,13] The reason behind this contrast might be the increasing trend of female literacy rate (29% to 35%) in Nepal in past five years.10 Most of the mothers, both case and control, in different studies from Ethiopia, Nepal and Tanzania[12,17,18,19] were from the rural areas and belonged to low socio-economic class.This study also revealed that most women came from rural areas and that only 14.3% of controls and nearly half of cases (43.3%) had incomes sufficient for six months.[13, 18]

Nearly half of both cases and controls were primi-gravid mothers and only 33.6% of the cases and more than half (58.3%) control were aware about the danger sign of pregnancy. These findings are in line with the study done in the community of Bahir Dar Zuria Woreda where 57.5% of cases and 51.1% of were multi-gravid[14] whereas few were primi-gravida in various studies done in South Sudan [20] and Ethiopia.[21] The use of ANC services among multiparous mothers may be influenced by their previous experiences thus delaying initiation of ANC.[22] Different studies[14,23] have shown higher ANC visit among women who had complications or danger signs during pregnancy whereas this study finding showed only 7.5% cases and 16.9% controls had complications during previous pregnancy.

Majority of case (68.7%) and control (80.5%) mothers had nearest health facility at a walking distance of less than 30 minutes which is supported by a study of Uganda[24] but contradicts the findings from study of Ethiopia where only 10.4% of mothers with ANC dropout had health facility at a distance of <30 minutes.[10] Likewise, this study stated that majority (84.2%) of mothers had done their ANC visit in public health facility which is consistent with other study done in Nepal.[25] Almost all of case and control

mothers had conceived by their desire (wanted pregnancy) which is similar to study conducted in Ethiopia[10] and inconsistent with Northern Ethiopia 79.4%.[26] Regardig to the decision making, two-thirds of both case and control mothers along with their husbands made decision about health seeking which is consistent to the study in Ethiopia[18] and previous study[26] respectively.

The study variables were taken for bivariate analysis where age, ethnicity, respondent's education, husband's education, place of residence, distance to health facility, knowledge on danger signs and income of family were found to be significant. Further, the significant study variables were taken for multivariate analysis where age, ethnicity, education, income and presence of complication were found to be significant with ANC drop out. In this study, age group less than 20 was 2.49 times high risk for ANC drop out than mothers who fall in group more than thirty (OR 0.840 CI 0.445-1.587). However, results from various studies have found mixed evidence of an association between age and ANC drop out. Study conducted in Lucknow[27] and Indonesia[28] shows similar findings with this study where there is association between increasing age and complete ANC visit. Whereas a study conducted in Ghana showed the findings contrary to this study where young age of women has been identified as a predisposing determinant for utilization of ANC services.[29]

In this study, ethnicity was found to be associated with ANC drop out with odds ratio of 2.99 (CI 1.052-4.994). The further analysis of NDHS survey 20113 to identify the effects of Caste, Ethnicity, and Regional Identity in Maternal and Child Health in Nepal show the findings consistent with this study where women from Terai/Madhesi have higher Odds for ANC dropout in comparison to other ethnicity.In this study, literacy remained protective factor as the mothers who were literate were 95% less likely to ANC dropout than illiterate. This study finding is supported by the Study conducted in Ethiopia[31] and Nigeria.[19] Review article has shown that education tends to positively affect health-seeking behaviors, and education may increase a woman's control over her pregnancy.[21]

The association with income is significant with ANC drop out in this study (OR3.496 CI 1.758-6.954). This study finding is similar to the study done in Nepal[13], and other countries like Ethiopia[17] and Nigeria which showed that women with poor economic status were less likely to attend 4 ANC visit. The present study result showed that presence of complications is associated with ANC dropout (OR 1.155 CI 0.546-2.440) which reflects that respondents who developed complications during pregnancy had ANC dropout. This finding is supported by the study conducted in Ethiopia shows reduction in complication with the adherence of ANC visit.[32]

CONCLUSION

The main factors for ANC dropout were age, ethnicity, education, income and the existence of complications during previous pregnancy. Thus, policy makers should plan for health initiatives on improving antenatal care for socio-economically disadvantaged women in rural areas of the nation. Establishing a community-based information center can be a good way to spread knowledge about ANC.

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CONFLICT OF INTEREST

This study has been presented as poster presentation at 8th National Summit of NHRC and only Abstract has been published in Abstract Book of NHRC. The researchers have no conflict of interest for publication of this manuscript in this journal.

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