Factors Related to Regular Use of ANC Services among Mothers of Children under One Year of Age in Rural Communities of Banke District, Nepal

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ABSTRACT

Introduction: The aim of this study was to identify the prevalence and factors associated with regular use of ANC services among mothers of children under one year of age in rural communities in Nepal. WHO has estimated that developing-region maternal mortality still remains as the leading cause of death among reproductive-age women, accounting for approximately 99% of global maternal deaths in 2015. **Method:** A community-based cross-sectional study was conducted in Banke District, Nepal among a sample of 364 pregnant women who delivered within last 12 months using face-to-face interviews with a semi-structured questionnaire. **Results:** Nearly 56% of women used standard ANC services in the last pregnancy (i.e., four or more check-ups). Around 30% of mothers had at least one complication during the pregnancy. ANC visits increase with decreased distance from a health center (AOR=2.197, 95% CI=1.165-4.144), decreased travelling cost (AOR=2.573, 95% CI=1.062 –4.484), decreased waiting time for service (AOR=2.940, 95% CI =1.445-5.981), increased quality of ANC services (AOR =2.099, 95% CI=1.247-3.536) and increased satisfaction of service (AOR =1.942 , 95% CI =1.212-3.110). Increased positive perception about ANC also increased the number of ANC visits. Further information from TV programs also helped to increase ANC visitation. **Conclusion:** Factors affecting regular utilization of ANC services were affordability and accessibility, such as distance to the health center, travel cost, waiting time, quality of ANC services and service satisfaction among lower-income, rural Nepalese women.

Key words: Utilization, ANC services, rural communities, Nepal

Introduction

According to the World Health Organization (WHO) (2013), worldwide, 292,982 women lost their lives due to complications related to pregnancy and childbirth in a single year. WHO has estimated that developing-region maternal mortality remains as the leading cause of death among reproductive-age women, accounting for approximately 99% of global maternal deaths in 2015. Sub-Saharan Africa alone accounts for 66% (201,000) of global maternal mortality, while South Asia accounts for one-third (66,000) [1, 2].

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Antenatal care (ANC) is an important component of maternal health by identifying complications and risk factors during pregnancy, and for planning for a safe delivery. The WHO recommends a minimum of four ANC checkups per pregnancy during the 4th month, 6th or 7th month, 8th month and 9th month of pregnancy. However data from WHO show that, between 2005 and 2010, only 53% of pregnant women worldwide had the four visits [3].Poor women in remote areas were the least likely to receive adequate ANC, especially for regions with low numbers of skilled health workers, such as sub-Saharan Africa and South Asia. Only 51% of the women in low-income countries benefit from skilled care during childbirth. In high-income countries, virtually all women have at least four ANC visits, and are attended by a skilled health worker during pregnancy, childbirth and the postpartum period. Factors affecting use of services are economic status,

distance from an ANC clinic, information about ANC, adequacy of services, and cultural practices[4].

The maternal mortality ratio (MMR) in Nepal decreased substantially between 1990, 2006 and 2011, from 539, 281 to 229 deaths per 100,000 births [5]. The National Safe Motherhood Program is a priority for the government of Nepal's health sector strategy, as set out in the Millennium Development Goals 5 (MDGs). Nepal has implemented the safe motherhood program nationwide since 1991 with the aim of reducing the maternal and neonatal mortality rates. The target of the program is to reduce the MMR by three-fourths between 1990 and 2015. The policy promotes use of skilled birth attendants (SBAs). In 2006, the Ministry of Health and Population (MOHP) has developed a new policy and strategy to reduce the MMR and ensure health for all and quality health care as a fundamental right [6]. Nepal is an economically poor country with a Human Development Index of 0.42, representing a population of 27.5 million [7].Around 88% of the population lives in a rural area, and 44% of households are below the poverty line [8].

Health surveys are used to determine the effects of socio-economic and demographic characteristics on several measures of health service utilization [9]. A key outcome variable is coverage of the recommended four ANC visits: once during the first and second trimester of pregnancy, and twice in the third trimester [10].

In the mid-western region of Nepal, Nearly 80% of pregnant women received one ANC check-up by an SBA, but only 39% had all four check-ups[11].. In Banke District of Nepal, the proportion of pregnant women with one ANC was 94% in 2013 and 90% in 2014. Among women with at least one ANC visit, about half completed all four check-ups. In Banke, some village development committees (VDC) reported very low ANC coverage. For example, the Chisapni VDC reported that only 29% of pregnant woman had a fourth ANC visit compared to 70% who had at least one ANC visit. While ANC coverage is not increasing, quality of ANC services is increasing in Banke District [12]. This study was conducted to identify the prevalence and the factors associated with regular use of ANC services among mothers of children under one year of age in rural communities in Nepal. The specific objective was to determine the proportion of regular utilization of ANC services and to determine the factors associated with regular use of ANC services in rural communities of Banke District.

Materials and Methods

Research Design: This was a community-based cross-sectional study to determine factors related to regular use of ANC services in rural communities of Banke District. The dependent variable was the utilization of ANC services in the last pregnancy by mothers who have a child under one year of age. The independent variables were hypothesized determinants of ANC utilization (i.e., predisposing, enabling and reinforcing factors) based on the Precede-Proceed Model.

Study area: The total area of the district is 2,337 sq k. The district is composed of 46 VDCs and one municipality, and has a total population of 512,222. This district borders with Surket, Salyan, and Dang Districts to the north, Uttar Pradesh of India to the south and Bardiya District to the west. Banke District has over 17,000 pregnant women in a typical year [13-15]. The protocol for the study was submitted for approval to the Ethical Committee of Mahidol University and the Banke District Public Health Office.

Population and sampling technique: The target population of the study is married women of reproductive age (18-49 years) who had at least one child within the prior 12 months in a rural community of Banke District. The sample size required for this study was calculated by using the Krejcie and Morgan Formula. The prescribed sample size was increased by 10% to allow for incomplete data or withdrawal of participants. The final sample size is 364.Multi-stage cluster sampling was used to select participants in this study. Firstly, six VDCs were randomly selected on the basis of low ANC coverage. In 2014, 2,425 pregnancies were reported in these six VDCs .

Analysis: Data were collected using a questionnaire developed by the researchers according to research objectives and based on the Precede-Proceed Model. The questionnaire was tested for content validity and then translated into the Nepali language before conducting a pre-test among 30 cases with similar characteristics as the intended sample. The reliability of the questionnaire was tested by using the Kuder-Richardson (KR) Formulae 21 and Cronbach's Alpha Coefficient for knowledge and perception, respectively. The KR 21 for knowledge was 0.83 and Cronbach's Alpha for perception was 0.90.Data were analyzed using SPSS Software Program (version 16) including descriptive statistics (e.g., about frequencies, percentage, median, mean and standard deviation) and

logistic regression with the level of confidence set at $p<0.05$.

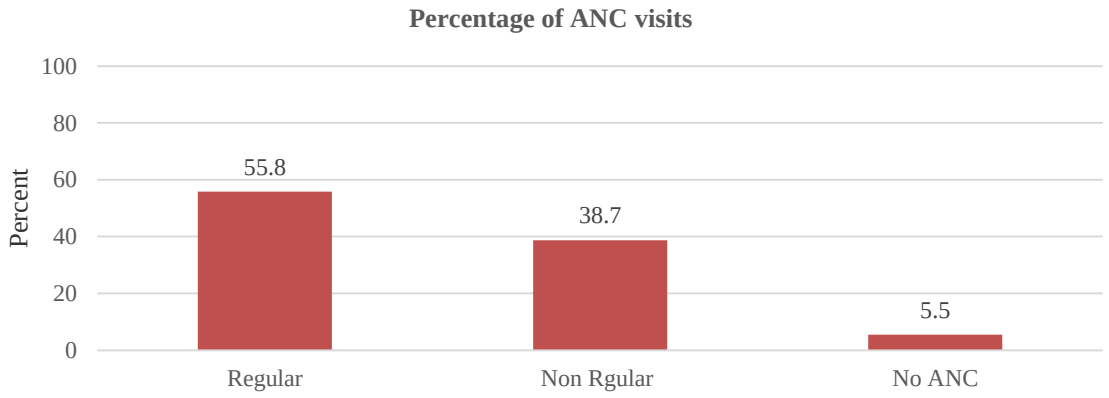
Results

This research aimed to identify factors determining regular use of ANC services in rural communities in Nepal. **Figure 1** shows that around 95% pregnancy women had at least one ANC visit during their last pregnancy. Over half (56%) of mothers reported they had at least four ANC visits while 39% had less than four visits, and 5% had none.

Table 1 shows that 80% of mothers were between 21 and 35 years of age, and the remainder were either older than 35 years (7%) or age 18 to 20 years (13%). Regarding occupation, 60% of respondents reported that their husbands worked in agriculture. Half the sample said they were members of the Chhetri Caste, and 83% were Hindu. Table 1 shows that under one-third (30%) had at least one complication during the last pregnancy. Most (88%) had a good level of ANC knowledge, while two-thirds had a good perception of ANC. About half (52%) the sample lived within two km of a health center, and the travel cost was from 1 to 50 rupees for 70% of the women. Most (87%) said the waiting time for ANC service was less than or equal to 20 minutes, and three-fourths (74%) said the quality of service was fair or good. Fully 64% said they were "satisfied" with the ANC service. Most (77%) of the women said their source of information on ANC was the local female community health volunteer (FCHV), and 60% also cited television as a source of information. Over half (57%) reported good family support for receiving ANC.

In Table 2, data on presented on the relationships between the independent variables and ANC utilization. Socio-demographic factors for ANC coverage include husband occupation (COR=1.682, 95% CI: 1.099-2.575), and predisposing factors for ANC coverage including complication (COR=1.772, 95% CI: 1.135-2.768), Perception for ANC services (COR=1.574, 95% CI: 1.003-2.472). Enabling factors for ANC coverage include distance from home to health center (COR=2.350, 95% CI: 1.256-4.397), travel cost (COR=2.424, 95% CI: 1.425-4.122), waiting time (COR=3.002, 95% CI: 1.469-6.135), quality of ANC services (COR=1.666, 95% CI: 1.034-2.684), and satisfaction of ANC services (COR=1.974, 95% CI: 1.279-3.047). Reinforcing factors include information on ANC seen on TV (COR=1.598, 95% CI: 1.049-2.435) and/or advice from the local FCHV (COR=1.631, 95% CI: .999-2.664). COR was used to determine the association between coverage of ANC services and the independent variables. Data are also presented on the significant predictors of regular use of ANC services. Multiple logistic regression analysis was used to identify the association between the independent factors, such as husband's occupation, complications of pregnancy, perception of ANC (AOR=1.558, 95% CI: 1.119-3.018), distance to the health center (AOR=2.197, 95% CI: 1.165-4.144), travel cost (AOR=2.573, 95% CI: 1.062-4.484), waiting time (AOR=2.099, 95% CI: 1.445-5.981), quality of ANC services (AOR=2.099, 95% CI: 1.247-3.536), satisfaction with ANC services (AOR=1.942, 95%, CI: 1.212-3.110) ANC information by TV (AOR=1.895, 95% CI: 1.181-3.042) and/or FCHV and regular use of ANC services. Some relationships were statistically significant.

Figure 1: Percent of the Sample Utilizing ANC Services (n =364)



Remark: *"Regular" denotes four or more visits; "Non-regular" denotes 1 to 3 visits*

Table 1: ANC Service Utilization by Socio-Demographic Characteristics and Other Factors

Factors	Non-regular		Regular		Total	Total
	n	(%)	n	(%)	n	%
Socio-demographic factors						
Age group (years)						
18 to 20	18	11.2	28	13.8	46	12.6
21 to 35	128	79.5	163	80.3	291	79.9
36 to 43	15	9.3	12	5.9	27	7.4
Mean = 26.9,SD =5.6,Min =18, Max=43						
Husband occupation						
Agriculture						
Works outside the	105	65.2	107	52.7	212	58.2
community	56	34.8	96	47.3	152	41.2
Religion						
Hindu	131	81.4	171	84.2	304	83.0
Buddhist	6	3.7	16	7.9	35	9.6
Muslim	22	13.7	13	6.4	22	6.0
Christian	2	1.2	3	1.5	5	1.4
Caste						
Brahmin	16	9.9	14	6.9	30	8.2
Chhetri	79	49.1	94	46.3	173	47.6
Dalit	23	14.3	29	14.3	52	14.3
Janajati	37	23.0	58	28.6	95	26.1
Kumal	6	3.7	8	3.9	14	3.8
Predisposing factors						
Number of complications						
No complications	99	61.5	150	73.9	249	64.4
1 or more complications	62	38.5	53	26.1	115	31.6
Knowledge						
Good	96	59.6	129	63.5	321	88.2
Not good	65	40.4	74	36.5	43	11.8
Mean =7.5,SD=0.9, Min=4, Max=9						
Perception						
Good	118	73.3	129	63.5	247	67.9
Not good	43	26.7	74	36.5	117	32.1
Mean=20, SD =2.38, Min=13,Max=26						
Enabling factors for ANC						
Distance to health center						
≤2 km	86	53.4	104	51.2	190	52.2
>2 km to ≤5 km	38	23.6	70	34.5	108	29.7
>5 km	37	23.0	29	14.3	66	18.1
Traveling costs						
No cost	29	18.0	11	5.4	40	11.0
Rs.1 to 50	90	55.9	161	79.3	251	69.0
More than Rs.50	42	26.1	31	15.3	73	20.0
Mean = 30,SD =30, Min = 0,Max=100						
Waiting time						
≤2 20 minutes	150	93.2	167	82.3	317	87.1
More than 20 minutes	11	6.8	36	17.7	47	12.9

Factors	Non-regular		Regular		Total	Total
	n	(%)	n	(%)	n	%
Quality of services	110	68.3	158	77.8	268	73.6
Good	51	31.7	45	22.2	96	26.4
Not good						
Satisfied with the ANC service	89	55.3	144	70.9	233	64.0
Yes	72	44.7	59	29.1	131	36.0
No						
Reinforcing factors for ANC						
Information from TV						
Yes	84	52.2	129	63.5	213	58.5
No	77	47.8	74	36.5	151	41.5
Information from the FCHV						
Yes	116	72.0	164	80.8	280	76.9
No	45	28.0	39	19.2	84	23.1
Family Support						
Good	145	90.1	185	91.1	206	56.6
Not good	16	9.9	18	8.9	158	43.4
Mean =11.77,SD =1,77,Min = 8 **Max=16**						

Table 2: The COR value and Multiple Logistic Regression to Predict Determinants of Minimum Recommended ANC Visits (≥ 4 times)

Factors	95% CI			P-	Adj.	95% CI		P-
	COR	Lower	Upper	Value	OR	Lower	Upper	value
Socio-demographic factor								
Husband occupation								
Agriculture	1.682	1.099	2.575	**.017***	1.502	.919	2.457	.105
Work outside	1				1			
Predisposing Factors								
1.Number of Complications								
No complications								
1 or more complication	1.772	1.135	2.768	**.012***	1.558	.932	2.603	.090
2.Perception	1				1			
Good								
Not good	1.574	1.003	2.472	**.049***	1.838	1.119	3.018	**.016***
	1				1			
Enabling factors								
1. Distance to heath center								
≤2 km	2.350	1.256	4.397	**.007***	2.197	1.165	4.144	**.015***
>2 km to ≥5 km	1.543	.878	2.711	.132	1.484	.838	2.627	.175
>5 km	1				1			
2. Traveling cost								
No costs	2.424	1.425	4.122	**.001***	2.573	1.062	4.484	**.001***
Rs.1 to 50	.514	.223	1.184	.118	.413	.243	.702	.118
More than Rs.50	1				1			
3. Waiting time								
≤ 20 minutes	3.002	1.469	6.135	**.003***	2.940	1.445	5.981	**.001***
More than 20 minutes	1				1			
4.Quality of health services								
Good	1.666	1.034	2.684	**.036***	2.099	1.247	3.536	**.005***
Not good	1				1			

Factors	95% CI			P-Value	Adj. OR	95% CI		P-value
	COR	Lower	Upper			Lower	Upper	
5.Satisfied with services								
Yes	1.974	1.279	3.047	**.002***	1.942	1.212	3.110	**.006***
No	1				1			
Reinforcing factors								
Information from TV								
Yes	1.598	1.049	2.435	**.029***	1.895	1.181	3.042	**.008***
No	1				1			
Information from the FCHV								
Yes	1.631	.999	2.664	**.049***	1.406	.830	2.380	.205
No	1				1			

Discussion

This study found that 94% of participants utilized ANC services during their last pregnancy. This result is slightly higher than a study from Nigeria which found that 91% of women utilized ANC services from a skilled ANC provider [16]. This study found that 56% of women had four or more ANC check-ups during the last pregnancy. This result is lower than a study in Indonesia which found that 66% of women had the four recommended ANC check-ups [5,17] Women whose husband worked as a local farmer had a higher level of ANC utilization compared to women whose husband worked outside the community. Women with one or more complications in the last pregnancy reported having ANC check-ups more often. A positive perception about ANC also was associated with increased ANC visits. These data are consistent with another study in the Eastern Terai region about ANC knowledge, complications and ANC visits [18].

This study was conducted to identify the prevalence and factors associated with regular ANC visitation and enabling factors. The findings from this study suggest that ANC utilization increases with decreased distance to the health center, decreased travel cost to the health center, decreased waiting time for service, increased quality of ANC services and increased satisfaction with service. The findings from this study are consistent with a 2013 qualitative study in rural Nepal [19]. Lower income is a major obstacle to greater use of ANC services, as found in similar studies in Lao PDR, Iran and Ghana[20-22]. ANC services should be made easily accessible to rural women to reduce travel distance and waiting time for ANC service. High quality service will increase ANC client satisfaction. Information dissemination about ANC through TV broadcasts helps to increase ANC visits. This study found higher ANC utilization compared to the 2011 national Demographic and Health Survey and a 2012 study in Dhanusa District in the Eastern Development Region of Nepal [5,23]. Advice and information from the local FCHV are also an important part of increasing utilization of ANC services. FCHV are a direct contact in rural community for pregnant women who play a supportive role for utilization of ANC services.

Conclusion

ANC visitation increases with decreased distance from the health center, decreased travel cost, decreased waiting time for service, increased quality of ANC services and increased satisfaction of services. Women whose husband works as a local farmer increases ANC visits compared to women whose husband works outside the community. Women with one or more complications are likely to go for ANC more often. Furthermore, increasing the positive perception about ANC also increases ANC visitation. Advice and information from the local FCHV and TV helps to increase ANC visitation.The main factors affecting regular utilization of ANC services among lower-income, rural Nepalese women are distance from the health center, travel cost, waiting time and satisfaction of service. Perception also plays a key role in service utilization. In planning appropriate maternity services, policy makers have to consider whether these are affordable and accessible to rural, lower-income Nepalese women.

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