



## Factor Analysis of Antenatal Care in Women of Fertilizing Age in Nepal

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Track Record Article	Abstract
<p>Accepted: 21 March 2024 Revised: 22 January 2024 Published: 23 March 2024</p> <p><b>How to cite :</b> Gautam, R. K., Pallikadavath, M., Rahman, K., &amp; Khan, M. A. S. (2024). Factor Analysis of Antenatal Care in Women of Fertilizing Age in Nepal. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 6(1), 440–452.</p>	<p><i>The high maternal and infant mortality rate in Nepal is a global problem. Antenatal Care (ANC) services are an effort to reduce maternal and infant mortality rates. This study aims to analyze factors in the utilization of antenatal care among women of childbearing age in Nepal. This research method The Nepal Demographic and Health Survey (NDHS) was carried out in the new era with official approval from the Ministry of Health and Population (MoHP), and the data collection period lasted from January 5 to June 22, 2022. The study population was women aged 15 to 49 years. who have given birth or experienced a stillbirth in the previous two years and have attended at least one antenatal care (ANC) visit. Data collection using questionnaires interviewed after they were discharged from the facility that provides delivery services. Data analysis using the JASP version 18 application to see the influence of the independent variable on the dependent variable. Bivariate data will be analyzed using chi-square analysis, and multivariate data will be analyzed using the logistic regression test. The research results showed that there was a relationship between age (<math>p &lt; 0.001</math>), place of residence (<math>p &lt; 0.001</math>), zone of residence (<math>p &lt; 0.001</math>), economy (<math>p &lt; 0.001</math>), education (<math>p &lt; 0.001</math>), number of children (<math>p &lt; 0.001</math>) women of childbearing age in Nepal with ANC visits. These factors greatly influence women of childbearing age in utilizing ANC services. Therefore, it is necessary to strengthen ANC service policies and remind women of childbearing age to make at least 4 ANC visits during pregnancy so that examinations and visits for pregnant women can be carried out completely.</i></p> <p><b>Keywords :</b> Antenatal Care, Women of childbearing age, Nepal</p>

### INTRODUCTION

Antenatal care (ANC) is a type of health service provided to pregnant women during pregnancy based on existing standards. The quality of health facilities can be assessed by the examination of maternal and newborn mortality rates. Accessible health services are an integral component of the quality of health facilities (Tadesse, 2020). The objective of Antenatal care is to safeguard pregnant women by timely identification of risk factors, as well as the prevention and management of complications by healthcare professionals. According to the Sustainable Development Goals (SDGs) in the health sector, the introduction of prenatal care is anticipated to lead to a decrease in both the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) (Girotra et al., 2023; Damayanti et al., 2023).

The global maternal mortality rate is significantly elevated, with approximately 287,000 deaths occurring during pregnancy, postpartum, and childbirth in the year 2020. Notably, nearly 95% of all maternal fatalities were concentrated in countries classified as low

and lower middle income (WHO, 2020). The maternal mortality rate in Nepal in 2018 was 6.361 per 1000 population. Meanwhile, the infant mortality rate in Nepal in 2019 was 25.243 per 1000 births (Atlas Big, 2019).

The government's effort to reduce maternal and infant mortality is by implementing safe motherhood. One of the pillars of safe motherhood is antenatal care. Antenatal care is important in monitoring fetal development and maternal health during pregnancy. With regular antenatal care checks, it is hoped that you can detect the risk of pregnancy or childbirth earlier (Angraini et al., 2022). Antenatal care is a strategy to improve the health of mothers and babies. In addition, low utilization of antenatal care services is a risk factor for maternal morbidity and mortality (Ali et al., 2020).

The impact if pregnant women do not make at least 4 antenatal care visits is that high risks during labor are not detected early and abnormalities that occur during pregnancy are not detected and can increase mortality and morbidity rates (Lassi et al., 2014; Denny et al., 2022). Based on research Anaba et al., (2022) stated that there is an influence between maternal age and antenatal care visits, in this case mothers aged 20-24 years are 1.5 times more likely to receive 4 or more antenatal care visits compared to mothers aged 15-19 years. Research Wulandari et al., (2021) stated that there is an influence between urban and rural areas on antenatal care visits. Pregnant women residing in rural regions exhibit a higher likelihood of attending a minimum of four prenatal care visits. Conversely, pregnant women residing in metropolitan regions have a higher likelihood of attending  $\geq 4$  antenatal care appointments.

Research Apanga et al., (2021), stated that there was an influence between the family's economic level and antenatal care visits ( $p$ -value=0.005). Pregnant women who have a high level of economic status tend to have  $\geq 4$  antenatal care visits compared to pregnant women who have a low level of economic status (Wulandari et al., 2021).

Research Apanga et al., (2022) stated that there is a relationship between education level and antenatal care visits, this is because secondary education or higher has a 26% higher prevalence of early antenatal care than less than secondary education. The higher the mother's education level, the more complete the antenatal care status will be, where pregnant women with higher education will have their pregnancy checked regularly.

Based on the background explained above, researchers want to know more about the low number of Antenatal Care visits among women of childbearing age in Nepal. The aim of this research is to determine the factors of antenatal care in women of childbearing age in Nepal.

## METHOD

The Nepal Demographic and Health Survey (NDHS) was conducted in a new era with the official approval of the Ministry of Health and Population (MoHP), and the data-gathering period spanned from January 5th to June 22nd, 2022. ICF contributed to the project by providing technical support through the United States Agency for International Development's (USAID)-funded DHS Program and financial and technical support for international demographic and health surveys.

Recent statistics indicate that 10% of women have a health state that is classified as either poor or very bad. Out of all the participants, a substantial percentage, 83%, identify as Hindu women. Upon analyzing the demographic makeup of the sample, it is worth mentioning that 37% of the female participants are identified as Janajati, 28% as Brahmin/Chhetri, 16% as Madhesi, and 15% as Dalit. Around 69% of women live in metropolitan areas, with a significant majority more than half residing in the terai zone. By comparison, the hill zone is home to 40% of women, while a mere 5% live in the mountain zone.

The various ANC services offered by the healthcare provider have a significant impact on the quality of care indicator for women aged 15 to 49 who have given birth or experienced a stillbirth in the previous two years and have attended at least one antenatal care (ANC) visit. This indication includes all females between the ages of 15 and 49 who have given birth to a live baby or experienced a stillbirth within the past two years. The effectiveness of antenatal care (ANC) in identifying pregnancy-related problems that could negatively affect pregnancy outcomes depends on the healthcare provider's specific components of ANC services.

In order to collect data, questionnaires were distributed to clients who received antenatal care (ANC) and family planning services or were responsible for sick children who underwent observation. Furthermore, postpartum clients were interviewed upon their release from facilities that provided delivery services. It is important to note that unlike ANC, family planning, and treatment for unwell children, the survey did not involve observing delivery services. This study conducted data analysis using the JASP version 18 application to see the effect of independent variables on the dependent variable. Bivariate data will be analysed using chi-square analysis, and multivariate data will be analysed using a logistic regression test.

## RESULTS

Antenatal care factors for women of childbearing age in Nepal can be seen in the table below:

**Table 1. Antenatal Care Factors in Women of Childbearing Age in Nepal**

Variable	Antenatal Care				Total		p-value
	Antenatal Care		No Antenatal Care		n	%	
	n	%	n	%	n	%	
<b>Age</b>							
<20 years	687	19.2	28	0.8	715	20.0	<0.001
20-34 years	2.537	70.9	174	4.9	2.711	75.7	
35-49 years	119	3.3	35	1.0	154	4.3	
<b>Total</b>	<b>3.343</b>	<b>93.4</b>	<b>237</b>	<b>6.6</b>	<b>3.580</b>	<b>100</b>	
<b>Residence</b>							
Urban	1.934	54.0	101	2.8	2.035	56.8	<0.001
Rural	1.409	39.4	136	3.8	1.545	43.2	
<b>Total</b>	<b>3.343</b>	<b>93.4</b>	<b>237</b>	<b>6.6</b>	<b>3.580</b>	<b>100</b>	
<b>Residential zone</b>							
Zone mountain	210	5.9	27	0.8	237	6.6	<0.001
Zone Hill	1.367	38.2	117	3.3	1.484	41.5	
Zone Terai	1.766	49.3	93	2.6	1.859	51.0	
<b>Total</b>	<b>3.343</b>	<b>93.4</b>	<b>237</b>	<b>6.6</b>	<b>3.580</b>	<b>100</b>	
<b>Economy</b>							
Hight	613	17.1	13	0.4	626	17.5	<0.001
Middel	1.452	40.6	56	1.6	1.508	42.1	
Lowest	1.278	35.7	168	4.7	1.446	40.4	
<b>Total</b>	<b>3.343</b>	<b>93.4</b>	<b>237</b>	<b>6.6</b>	<b>3.580</b>	<b>100</b>	
<b>Education</b>							
SLC and above	900	25.1	10	0.3	910	25.4	<0.001
Some secondary	881	24.6	25	0.7	906	25.3	
Primary	641	17.9	54	1.5	695	19.4	
No Education	921	25.7	148	4.1	1.069	29.9	
<b>Total</b>	<b>3.343</b>	<b>93.4</b>	<b>237</b>	<b>6.6</b>	<b>3.580</b>	<b>100</b>	
<b>Number of children</b>							
Children 1	2	0.6	29	8.3	31	8.9	<0.001
Children 2-3	0	0.0	30	11.2	39	11.2	
Children 4-5	0	0.0	134	38.4	134	38.4	
Children 6	110	31.5	35	10.0	145	41.5	
<b>Total</b>	<b>112</b>	<b>32.1</b>	<b>237</b>	<b>67.9</b>	<b>349</b>	<b>100</b>	

Based on Table 2, the research results show that the majority of women of childbearing age in Nepal aged 20-34 years tend not to have  $\geq 4$  Antenatal Care (ANC) visits, 174 (4.9%). Based on the results of the chi-square test, the p-value =  $<0.001$  ( $<\alpha$  0.05), meaning there is a relationship between the age of fertile women in Nepal and ANC visits.

The majority of women of childbearing age in Nepal who live in rural areas tend not to have ANC visits  $\geq 4$  times as many as 136 (3.8%). Based on the results of the chi-square test, the p-value =  $<0.001$  ( $<\alpha$  0.05), meaning that there is a relationship between where women of childbearing age live in Nepal and ANC visits.

The majority of women of childbearing age in Nepal who live in the hill zone tend not to have ANC visits  $\geq 4$  times as many as 114 (3.3%). Based on the results of the chi-square test,

the p-value =  $<0.001$  ( $<\alpha 0.05$ ), meaning there is a relationship between the zone where women of childbearing age live in Nepal and ANC visits.

The majority of women of childbearing age in Nepal who have the lowest economic level tend not to make ANC visits  $\geq 4$  times as many as 168 (4.7%). Based on the results of the chi-square test, the p-value =  $<0.001$  ( $<\alpha 0.05$ ), meaning that there is a relationship between the economic level of women of childbearing age in Nepal and ANC visits.

The majority of women of childbearing age in Nepal who have no education level tend not to have ANC visits  $\geq 4$  times as many as 148 (4.1%). Based on the results of the chi-square test, the p-value =  $<0.001$  ( $<\alpha 0.05$ ), meaning that there is a relationship between the education level of women of childbearing age in Nepal and ANC visits

The majority of women of childbearing age in Nepal with 4 to 5 children tend not to have ANC visits  $\geq 4$  times as many as 134 (38.4%). Based on the results of the chi-square test, the p-value =  $<0.001$  ( $<\alpha 0.05$ ), meaning there is a relationship between the number of children of women of childbearing age in Nepal and ANC visits.

**Table 2. Factors Influencing Antenatal Care in Women of Childbearing Age in Nepal**

Variabel	B	Sig.	OR
Age	175.849	0.998	0.000
Residence	-19.128	0.996	1.892
Residential zone	42.084	0.995	1.000
Economy	-40.995	0.999	1.200
Education	175.849	0.997	2.346
Number of children	-18.482	0.998	1.030

Based on Table 3, logistic regression analysis shows that there is no influence of age, place of residence, zone of residence, economy, level of education and number of children with Antenatal Care in Women of Childbearing Age in Nepal.

## DISCUSSION

### Relationship between Age and Antenatal Care Visits in Women of Childbearing Age in Nepal

A person's age is influenced by biological and psychological factors, and with maturity and life experience, they usually become more adept at understanding and processing information (Gopnik et al., 2017). However, a pregnant woman's advancing age may affect her ability to understand information related to pregnancy check-ups and visits during pregnancy. Younger pregnant women may have a lower understanding of the importance of these check-ups than older women (Coccia et al., 2018).

The chi-square test showed that there is an association between the age of childbearing women in Nepal and ANC visits. Factors age had a significant positive relationship with the

number of children delivered at home ( $r=0.574$ ) (Ngotiek et al., 2021). In line with Nisingizwe et al., (2020) research, it shows that there is a relationship between age and antenatal care visits among women of childbearing age in Rwanda ( $p\text{-value } 0.001 < 0.05$ ).

In line with Yaya et al., (2017) study, which showed that there was an association ( $p\text{-value } 0.0001 < 0.005$ ) of age with women reporting the first ANC visit during the first trimester and attending at least 4 ANC visits. In line with Laksono et al., (2022) research, it shows that there is a relationship between age and ANC visits among female workers in Indonesia, with a  $p\text{-value}$  of 0.001.

The connection between a woman's age and her utilization of antenatal care suggests that older women are more likely to access prenatal care adequately than younger women. This may be attributed to the fact that younger women may have limited experience in pregnancy care. Furthermore, women with higher levels of education are more likely to utilize antenatal care adequately than those with less education, indicating that education level is a contributing factor in the utilization of prenatal care (Wondimu et al., 2017).

### **Relationship between Residence and Antenatal Care Visits in Women of Childbearing Age in Nepal**

Urban-rural disparity has a tremendous influence on utilization status of ANC and other maternal health care services (WHO, 2018). There are some distinctions between urban and rural locations that could potentially influence variations in the utilization and content of antenatal care (ANC). Numerous studies conducted in low-income nations have consistently demonstrated superior utilization of antenatal care (ANC) in urban regions in comparison to rural areas (Langa & Bhatta, 2020). The chi-square test showed that there is an association between residence of childbearing women in Nepal and ANC visits.

Wulandari (2021) research states that there is a relationship between place of residence and ANC visits ( $p=0,000$ ). There is a higher likelihood for women residing in urban regions to undergo antenatal care (ANC) at least four times compared to women residing in rural areas. (Wulandari et al., 2021). Furthermore, women residing in urban regions who undergo antenatal care (ANC) at least four times are more inclined to deliver their babies in healthcare facilities compared to women residing in rural areas (Laksono, 2020).

The research results are in line with Tadesse (2020) Existing research has demonstrated a correlation between individuals' place of residence and their utilization of antenatal care (ANC) services. moms residing in urban regions were 9 times more inclined to avail themselves of ANC services compared to moms residing in rural areas ( $AOR=9.13$ ,  $95\% \text{ CI}=1.28\text{--}65.31$ )

(Tadesse, 2020). Those living in rural areas, compared to urban areas, were less likely to make at least four ANC visits but more likely to avoid attending ANC visits (El-Khatib et al., 2020).

Many of the health facilities in Nepal are situated in urban areas and they are accessible. Effective policies to address rural–urban differentials in this regard is a requirement for better ANC health care services (Babalola, 2014). In the same vein, regional disparities were noted in the underutilization of ANC services (El-Khatib et al., 2020).

### **Relationship Between Zone of Residence and Antenatal Care Visits Among Women of Childbearing Age in Nepal**

Community factors include characteristics of the community where an individual lives, such as geographic location (called an ecological belt and symbolized by mountains, hills and tarai) (Bhatt et al., 2018). The zone of residence is very important in the use of health services (Jebena et al., 2022). The chi-square test showed that there is an association between Ecological zone of childbearing women in Nepal and ANC visits.

Belay (2022) research state there is a relationship between zone of residence and visiting ANC services (value= $<0.001$ ). In line with Tanou (2021) show that there is a relationship between ecological zone with utilization of ANC services in Nepal ( $p<0.001$ ). Research by Gupta (2014) found that there was a relationship between residential zone and ANC utilization ( $p<0.001$ ).

Women from Terai region of Nepal were more likely to attend ANC. Factors such as easy access to transportation; easier access to health facilities could be facilitating factors for women to attend ANC early in Terai region of Nepal. Less distance to nearest health post from home could be a facilitating factor for early ANC visit since a study conducted in western Nepal showed positive association of ANC visit with less distance. Nepal's mountain and hill region have difficult topography and women have to walk for hours if not days to reach to a health facility. Although ANC is provided through PHC-ORC clinics community-based outreach clinics conducted once a month these clinics are mostly nonfunctional and have very poor infrastructures often running in open space (Tanou et al., 2021).

### **Economic Relationship with Antenatal Care Visits in Women of Childbearing Age in Nepal**

An individual's socioeconomic status significantly shapes adherence to ANC visits (Islam & Masud, 2018). It has been observed that individuals belonging to higher socioeconomic strata are more likely to attend ANC check-ups, which is attributed to their financial ability to allocate funds for the purpose and their propensity to achieve positive

outcomes (Sarkar et al., 2021). Based on the results of the chi-square test, there is an association between the economic level of women of childbearing age in Nepal and ANC visits.

The results of the study are in line with the findings of Rurangirwa et al., (2017), who showed that parental income is associated with the number and timing of antenatal care visits in Rwanda with a p-value of 0.06. The results of the study are in line with the findings of Paudel et al., (2017) who showed that there is an association of all economic categories (poor, middle, rich, richer) with inequality in early initiation of first antenatal care with a p-value of 0.001.

According to Moyer et al., (2014), hidden costs such as transportation costs, diagnostic costs and opportunity costs due to lost wages can also be barriers to timely ANC for women from poor households. In addition, poorer women are less likely to get permission from husbands and family members to visit health facilities for ANC check-ups due to workload. Similarly, experiences of poor treatment at previous visits by poor women to health providers may be associated with hesitancy to start ANC at an early stage.

### **Relationship between Education and Antenatal Care Visits in Women of Childbearing Age in Nepal**

Education can confer a greater comprehension of diverse issues, particularly health issues, imparting an edge to women possessing secondary or higher education over those deprived of educational prospects (Adewuyi et al., 2018). Based on the results of the chi-square test, there is an association between the education level of women of childbearing age in Nepal and ANC visits.

Factors education had a significant positive relationship with the number of children delivered at home ( $r=0.677$ ) (Ngotiek et al., 2021). In line with Nisingizwe et al., (2020) research, it shows that there is a relationship between education and antenatal care visits among women of childbearing age in Rwanda (p-value  $0.001 < 0.05$ ).

In line with Tsegaye et al., (2021) research's, it showed that respondents' education was significantly associated (p-value 0.001) with the utilization of antenatal care services among women who gave birth five years. In line with Ali et al., (2020) research study, the results showed that there was a relationship between educational status and the use of antenatal care services in Thatta District (p-value  $0.002 < 0.005$ ).

Among the 7.167 women in this study, 2.598 (36.6%) had received a minimum of four antenatal care (ANC) services in Ethiopia. The findings of this study suggest that several variables, such as geographical location, geographical region, maternal degree of education, household wealth index, intention to conceive, frequency of newspaper reading, frequency of radio listening, and frequency of television viewing, illustrated a statistically significant



association with the utilization of at least four antenatal care (ANC) services in Ethiopia, with a significance level of 5% (Basha, 2019).

Mothers who received a greater number of ANC components had a greater likelihood of choosing to attend PNC. The provision of additional antenatal care (ANC) components suggests that the mother is more inclined to be educated about potential difficulties that may arise following childbirth, hence acknowledging the significance of prompt postnatal care (Fekadu et al., 2019).

### **Relationship between Number of Children and Antenatal Care Visits in Women of Childbearing Age in Nepal**

Undertakings involving multiple offspring may present an arduous task for families to manage their temporal and material resources, especially in light of the financial implications of nurturing a larger brood (Puri et al., 2020). Based on the results of the chi-square test, there is an association between the number of children of women of childbearing age in Nepal and ANC visits.

In line with Tsegaye et al., (2021) study, it showed that the number of children of respondents was significantly associated (p-value 0.003) with the utilization of antenatal care services among women who gave birth five years. In line with the results of Adewuyi et al., (2018) research, which shows that there is a relationship between the number of child births with the prevalence of ANC (<4 times ANC attendance) with a p-value of 0.001.

The results of the study are in line with Acharya et al., (2018) research which shows that there is a relationship between income and the utilization of selected antenatal care services (p-value 0.001). From the results of Ousman et al., (2019) study, it was found that there was a significant relationship (p-value <0.01) between the number of antenatal care visits.

A maternal figure who has brought forth multiple offspring may possess a more profound understanding of the importance of attending ANC appointments and their positive impact on maternal and infant health. This understanding could be an additional motivation for her to attend these appointments consistently (WHO, 2018).

### **CONCLUSION**

Based on the research results, it was concluded that there was a relationship between age (p<0.001), place of residence (p<0.001), zone of residence (p<0.001), economy (p<0.001), education (p<0.001), number of children (p< 0,000) women of childbearing age in Nepal with ANC visits. The majority of women of childbearing age have utilized ANC services in Nepal, but it has not worked optimally. Therefore, researchers suggest strengthening ANC policies as

well as reminding women of childbearing age to make at least 4 ANC visits during pregnancy so that examinations and visits for pregnant women can be carried out completely.

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