

Factors associated with participation in antenatal care in Granada, Nicaragua

Ryoko KAWASAKI¹, Ayano MARUTA², Ayano HIRASHIMA³,
Misato NISHINO³, Mayumi OHNISHI¹

Abstract

Objectives: Several studies have indicated the effectiveness of appropriate antenatal care (ANC) attendance to reduce general perinatal complications, neonatal tetanus and death, and low birth weight. This study was performed to evaluate factors associated with ANC attendance in the early gestational period and frequency of ANC attendance among pregnant women in underserved settings, such as the Granada Department, Nicaragua.

Methods: Four of 33 health facilities in the Granada Department, Nicaragua, were randomly selected for this study. ANC information, including age, number of years of formal education, number of previous pregnancies, number of children, gestational week at the first ANC attendance, and number of ANC attendances during the pregnancy, was collected from ANC records, which were administered by four selected health facilities from January 1, 2000 to December 31, 2000. Descriptive analysis, Spearman's rank correlation coefficient, and multiple linear regression analysis were conducted.

Results: ANC record data from 245 pregnant women, estimated as 4% of the annual number of pregnancies in the Granada Department, were analyzed in the present study. Having a partner was an independent factor contributing to early gestational week at the first ANC attendance, and higher educational status was an independent factor contributing to high number of ANC attendances in the present study.

Conclusions: Having a stable partner and higher educational status may improve timely and appropriate ANC attendances. Health care providers should encourage better maternal health behavior among women without partners and those with low educational status.

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Introduction

Maternal health care services were emphasized as part of the Millennium Development Goal 5 (MDG-5), but several challenges remain for universal access to improve maternal health. Timely access and appropriate frequency of antenatal care (ANC) as well as skilled birth attendance are key elements to improve maternal health and pregnancy outcomes. However, there have been a number of discussions regarding the appropriate number of ANC attendances during pregnancy¹⁻³, because ANC by itself does not contribute to avoidance of maternal death⁴. On the other hand, the

World Health Organization (WHO) recommends that all pregnant women should receive at least four ANC⁵, and it is recommended that the first ANC attendance should be before 12 gestational weeks⁶. Most developing countries adhere to these recommendations. Adequate conditions and environments for cesarean section and blood transfusion, taking into consideration delays in the decision to seek care, delays in reaching care, and delays in receiving adequate health care, are widely recognized as necessary to avoid unnecessary maternal deaths⁷. On the other hand, several studies have indicated the effectiveness of appropriate ANC

1 Nagasaki University Graduate School of Biomedical Sciences, Nagasaki, Japan

2 Tokyo Women's Medical University Hospital

3 Nagasaki University Hospital

attendance for reducing general perinatal complications⁸⁾, neonatal tetanus and deaths⁹⁾, and low birth weight¹⁰⁾.

In both industrialized and developing countries, low maternal education level, non-marital status, and high parity are associated with inadequate use of ANC¹¹⁻¹²⁾. The principal barriers for utilization of health care services, including ANC, are education, distance to health facilities, and economic status¹³⁾. A study conducted in Brussels, Belgium, indicated that women of non-European origin, low educational status, low income status, multipara, those initiating ANC after 14 weeks of gestation, and those without medical risks visited health facilities fewer times for ANC during their pregnancies¹⁴⁾. Having a previous experience of inadequate care or no benefit of ANC also decreased women's motivation to participate in ANC attendances¹⁵⁾. In addition, cultural barriers have been shown to limit access to ANC in both industrialized countries, especially among migrants, and in middle- and low-income countries¹⁵⁻¹⁷⁾.

Supply-side factors, such as satisfactorily responding to clients' needs with cultural sensitivity, also showed an important influence on ANC attendance¹⁸⁾. A previous study in Paraguay demonstrated an increase in number of ANC attendances during pregnancy at health facilities after implementation of quality care training for health personnel working in rural areas with limited resources¹⁹⁾. Demand-side factors including previous negative birth experiences, such as stillbirth and miscarriage, were associated with a wish for more ANC attendances, while older age and having more than two children were associated with a wish for fewer ANC attendances²⁰⁾. In addition, satisfaction with current ANC, convenience, and low/affordable costs, including transportation costs, were factors encouraging ANC attendance²¹⁾.

Nicaragua is one of the poorest countries in Latin America, with a gross national income per capita of US\$1,080²²⁾. The under-5 mortality rate is 27 per 1,000 live births, and maternal mortality rate is 100 per 100,000 live births²²⁾. Granada is the capital of the Granada Department, and is one of the principal historical cities in Nicaragua. The Granada Department had a population of 179,438 in 2001, with the majority of people living in its capital, Granada City (population: 111,886 in 2001). Although the capital of the Department, there are both semi-urban and rural areas in Granada City. Granada was founded in 1524 as the earliest Spanish city in the Americas, and as such is a historically important city. Therefore, tourism plays an

important role in the economy of Granada. The main commercial products of Granada are cotton, sugar cane, tobacco, and bananas. The number of physicians per 10,000 in the population was 7.7, that of nurses was 5.0, and that of auxiliary nurses was 7.3 in the Granada Department in 2001, and these were concentrated in the capital city providing healthcare services—not only general medical services but also assistance with childbirth—in the only hospital in the Department.

According to the health report of the Granada Department, 66.9% of births were by institutional delivery at the only hospital in the Department and/or one of the health centers with the most comprehensive functional capabilities, including institutional delivery, among the seven health centers in Nandaime the second largest city in the Granada Department in 1998, while 63.6% of childbirth were occurred by institutional delivery in Nicaragua. A preliminary study indicated that roughly 90% – 95% births among women living in the downtown area of Granada City were by institutional delivery, while the figure was only 50% – 80% of births in rural areas. The remaining births were at home with the assistance of a traditional birth attendant or family members, or at a health post with nursing staff but without institutional delivery facilities. There is no local government pregnancy registration system in the Granada Department, and it was therefore not possible to determine the annual total number of pregnancies or to calculate the exact percentage of women who received ANC at least once during their pregnancy. However, it was estimated from the available data of the Granada Department that about 70% of pregnant women received ANC at least once during their pregnancy. Most pregnant women who received ANC visited a health center or health post for ANC before gestational week 32, and were referred either to the hospital or to a health center with institutional delivery facilities. As the hospital is located outside of the downtown area of Granada City, it is necessary for women to take a bus, taxi, or individual transportation to the hospital, even for those living in the city. The health center with institutional delivery facilities in the second largest city in the Granada Department, Nandaime, is located in the downtown area and is therefore more easily accessible by those living close to the city center.

The present study was performed to evaluate factors associated with early gestational week at the first ANC attendance among pregnant women in underserved settings, such as the Granada Department, Nicaragua. The findings of the present study would be expected to

identity factors that should be addressed to facilitate appropriate and timely use of maternity healthcare services.

Methods

Four health facilities, including one health center with institutional delivery facilities, and three health posts with no such facilities, but no hospital, were randomly selected from among 33 health facilities (7 health centers with at least one physician and 26 health posts with only one or two nursing staff) in the Granada Department, Nicaragua. As mentioned in the Introduction, most ANC was performed at local health facilities, and pregnant women who received ANC in the hospital may have been those with risks and/or complications and/or after gestational week 32. Therefore, data were collected from selected local health facilities, but not the hospital, for the present study.

Data pertaining to ANC, including age, number of years of formal education, marital status (with partner: married or receiving economic support as common-law wife from a partner who may either be living together or separately; without partner: single or divorced/separated), number of previous pregnancies, number of children, gestational weeks at the first ANC attendance, and number of ANC attendances during the pregnancy, were collected from the records of four selected health facilities from January 1, 2000 to December 31, 2000. In general, childbirth outside of legal marriage, such as babies born to common-law wives and/or single mothers, is common in Latin America. Therefore, we established categories of with/without a partner to represent having a stable partner at the time of data collection. Four pregnancies that were terminated as abortion or premature stillbirth were excluded from the study. Descriptive analysis was performed to determine women's sociodemographic conditions, Spearman's rank correlation coefficient was used to analyze correlations between sociodemographic information, gestational week at the first ANC, and number of ANC attendances during the pregnancy, and multiple linear regression analysis was performed to evaluate associations among sociodemographic factors, gestational week at the first ANC, and number of ANC attendances during the pregnancy. IBM SPSS version 20.0 was used for statistical analysis. In all analyses, $P < 0.05$ was taken to indicate statistical significance.

Prior to commencement of the survey, this study was approved by the local government health office and representatives of the selected health facilities af-

ter being informed regarding the study procedure and ethical issues. The present study was approved for publication by the Ethics Committee of Nagasaki University Graduate School of Biomedical Sciences.

Results

Table 1 shows sociodemographic information, gestational weeks at the first ANC, and number of ANC attendances during the pregnancy for 245 pregnant women obtained from ANC records, corresponding to an estimated 4% of the total annual number of pregnancies in the Granada Department. The mean age of the women was 22.5 ± 5.9 (mean \pm standard deviation [SD]); the youngest was 12 years old and the oldest was 41 years old in the present study. In Table 1, pregnant women were divided into two groups according to age: those under 20 years old and those 10 years old or older, because high rates of teenage pregnancy and birth are among the health challenges in Nicaragua. A total of 115 (46.9%) women did not complete primary school, and the mean number of years of formal education received was 5.4 ± 3.5 . Twenty-one (8.6%) women currently had no partner, 89 (36.3%) women were primiparas, and 96 (39.2%) women had no children at the first ANC attendance in the pregnancy. The mean number of previous pregnancies was 1.7 ± 2.0 (range: 0–11). The mean number of children was 1.4 ± 1.7 (range: 0–8). One hundred seventy-four (71.0%) women visited a health facility for the first ANC before 20 gestational weeks, and the mean gestational week at the first ANC attendance was 16.02 ± 7.647 (range: 1–40), which was later than the WHO recommendation (before 12 weeks), but corresponding to the local recommendations for the latest timing of the first ANC attendance. One hundred twenty-three (50.2%) women received four or more ANC attendances in the pregnancy in accordance with the WHO recommendations, and the mean number of ANC attendances was 3.60 ± 1.941 (range: 1–9).

One woman first attended ANC in the first gestational week. It was likely that she visited the health facility for advice from health professionals after having sexual intercourse, because she was an unmarried 19-year-old woman, but with a partner as cohabitant, with two previous pregnancies but no children; although it was not possible to determine her situation from the available data, it is likely that her two previous pregnancies had ended in abortion and/or stillbirth. She made a total of eight ANC attendances during her pregnancy.

Table 1. Sociodemographic characteristics, gestational week at the first ANC, and number of ANC attendances during the pregnancy of study participants ($n = 245$)

		<i>n</i>	%
Age group	< 20 years old	95	38.8
	≥ 20 years old	150	61.2
Educational status	Primary school not completed	115	46.9
	Primary school completed	130	53.1
Marital status	Without partner	21	8.6
	With partner	224	91.4
Parity	Primipara	89	36.3
	Multipara	156	63.7
Children	No child	96	39.2
	Having children	149	60.8
Gestational week at the first ANC	< 20 weeks	174	71.0
	≥ 20 weeks	71	29.0
Number of ANC attendances during the pregnancy	< 4 times	122	49.8
	≥ 4 times	123	50.2

ANC: Antenatal care

Table 2 shows the Spearman's rank correlation coefficients (r) between each sociodemographic characteristic and gestational week at the first ANC or number of ANC attendances. Factors positively associated with early gestational week at the first ANC attendance were higher educational status ($r = 0.142$, $P = 0.026$), having a partner ($r = 0.183$, $P = 0.004$), primipara ($r = 0.185$, $P = 0.004$), and having fewer children ($r = 0.174$, $P = 0.006$), although Spearman's rank correlation coefficients were weak. Factors positively associated with frequent ANC attendance in the pregnancy were higher educational status ($r = 0.219$, $P = 0.001$), having fewer children ($r = 0.174$, $P = 0.006$), and early gestational week at the first ANC ($r = 0.541$, $P < 0.001$), although Spearman's rank correlation coefficients were not strong.

Table 3 shows factors associated with gestational

week at the first ANC and number of ANC attendances during the pregnancy as determined by multiple linear regression analysis. Having a partner ($P = 0.009$) was a factor associated with early gestational week at the first ANC regardless of age, number of years of formal education, and number of children. Larger number of children ($P = 0.035$) was a factor associated with early gestational week at the first ANC after adjusting for the number of years of formal education and marital status. Multiparity ($P = 0.005$) was a factor associated with late gestational week at the first ANC regardless of age, number of years of formal education, and marital status. Higher educational status ($P = 0.007$) was a factor associated with frequent ANC attendance during the pregnancy regardless of age, marital status, and number of children.

Table 2. Correlations among sociodemographic characteristics, gestational week at the first ANC, and number of ANC attendances during the pregnancy of study participants ($n = 245$)

	Age		Number of years of formal education		Marital status (without/with partner)		Parity (primipara/multipara)		Number of children		Gestational week at the first ANC	
	<i>r</i>	<i>P</i> -value	<i>r</i>	<i>P</i> -value	<i>r</i>	<i>P</i> -value	<i>r</i>	<i>P</i> -value	<i>r</i>	<i>P</i> -value	<i>r</i>	<i>P</i> -value
Number of years of formal education	0.107	0.095										
Marital status (without/with partner)	0.079	0.219	0.102	0.110								
Parity (primipara/multipara)	0.562	<0.001	-0.099	0.121	0.102	0.111						
Number of children	0.694	<0.001	-0.205	0.001	0.060	0.347	0.831	<0.001				
Gestational week at the first ANC	0.045	0.481	-0.142	0.026	-0.183	0.004	0.185	0.004	0.174	0.006		
Number of ANC attendances during the pregnancy	-0.039	0.543	0.219	0.001	0.088	0.171	-0.113	0.076	-0.174	0.006	-0.541	<0.001

Spearman's rank correlation coefficient was calculated.

Table 3. Factors associated with early ANC attendance and number of ANC attendances during the pregnancy ($n = 245$)

	Gestational week at the first ANC		Number of ANC attendances during the pregnancy	
	β	<i>P</i> -value	β	<i>P</i> -value
Age	0.030	0.752	-0.026	0.785
Number of years of formal education	-0.058	0.400	0.188	0.007
Marital status (without partner/with partner)	-0.167	0.009	0.074	0.242
Number of children	0.112	0.248	-0.074	0.448
Total values				
R^2	0.052		0.056	
<i>F</i>	3.282		3.541	
<i>P</i> -value	0.012		0.008	
Number of years of formal education	-0.050	0.434	0.181	0.005
Marital status (without partner/with partner)	-0.166	0.009	0.073	0.246
Number of children	0.135	0.035	-0.093	0.144
Total values				
R^2	0.051		0.055	
<i>F</i>	4.359		4.715	
<i>P</i> -value	0.005		0.003	
Age	0.007	0.928	-0.034	0.643
Number of years of formal education	-0.062	0.331	0.196	0.002
Marital status (without partner/with partner)	-0.184	0.004	0.082	0.198
Parity (primipara/multipara)	0.208	0.005	-0.090	0.221
Total values				
R^2	0.078		0.059	
<i>F</i>	5.055		3.786	
<i>P</i> -value	0.001		0.005	
Number of years of formal education	-0.061	0.331	0.191	0.003
Marital status (without partner/with partner)	-0.184	0.004	0.082	0.198
Parity (primipara/multipara)	0.211	0.001	-0.108	0.088
Total values				
R^2	0.078		0.059	
<i>F</i>	6.765		4.993	
<i>P</i> -value	<0.001		0.002	

Multiple liner regression analysis was performed. β : Standardized regression coefficient.

Discussion

As mentioned in the Methods section, due to a lack of local government pregnancy registration system it was not possible to determine the exact percentage of the total number of pregnant women in the Granada Department represented by this study population. However, as a rough estimate, the present study included about 4 % of all pregnant women in the Granada Department. Pregnant women under more isolated and underserved conditions who did not visit health facilities for ANC were not included in the present study. The study population data were collected from health centers and/or health posts with and without physicians and functional capabilities for delivery. In addition, the hospital and health centers with facili-

ties for delivery were located in areas that may have been relatively inaccessible for pregnant women. It is estimated that the main reasons pregnant women chose a particular place for ANC may have been physical accessibility and convenience.

In the present study, having a partner was identified as a factor positively correlated with early gestational week at the first ANC attendance. A study performed in Jamaica indicated that married women were more likely to seek ANC earlier than unmarried women²³⁾. In a previous study in Paraguay, having a partner was shown to positively influence improvement of maternal health knowledge in rural settings with limited resources²⁴⁾. Taking the Latin American context into consideration, "having a partner" included mar-

ried women, common-law wives, and women receiving economic support from a partner despite living separately in both the present study and in the previous study in Paraguay²⁴⁾. Having a partner may potentially provide a positive influence on women's health behavior and health literacy. However, in the present study, we did not consider relationships between women and their partners, including negative effects such as domestic violence, and cohabitation. Further studies are required to evaluate the impact of relationships between women and their partners, and cohabitation with a partner on women's health behavior and health literacy.

Consistent with previous studies^{20),25)}, in the present study women with many children tended not to visit health facilities for ANC the recommended number of times, although statistical significance disappeared after adjustment for the other factors. It is possible that multiparous women are confident because of their previous experiences of pregnancy and childbirth, and therefore they may have little motivation to receive ANC. A study performed in Ethiopia demonstrated the limited effectiveness of previous experience of skilled institutional delivery on re-seeking of the same type of childbirth care²⁶⁾. It will be necessary to encourage multiparous women to access ANC early in their pregnancies and to complete a sufficient number of visits, especially in rural areas with limited resources and for socially disadvantaged women.

Data related to socioeconomic conditions, including household income, family members, and cohabitation with a partner, were not available in the present study. Therefore, the depth of discussion regarding accessibility of ANC is necessarily limited. Four cases in which the pregnancies ended in abortion or premature stillbirth were excluded from this study, but these cases were detected before 32 gestational weeks at four selected health facilities without functional capabilities for institutional delivery. It was not possible to detect other cases in which pregnancy ended in abortion or stillbirth at the hospital and/or health facilities with functional capabilities for institutional delivery. Health centers and health posts without function capabilities for institutional delivery usually determine the outcome of birth when mothers bring their babies for immunization and growth monitoring. Therefore, there were probably cases in which the pregnancy ended before term delivery. Despite the limitation of evaluation concerning associations with socioeconomic conditions, the present study suggested that having a

partner may improve timely and appropriate ANC attendance by pregnant women, even among those with low educational status.

Conclusions

Having a stable partner and higher educational status may improve timely and appropriate ANC attendance by pregnant women in Latin America. Therefore, health care providers should encourage better maternal health behavior among women without partners and those with low educational status.

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ニカラグア国グラナダ州における妊婦ケアへの参加に関連する要因

川崎 涼子¹・丸田 綾乃²・平島 綾乃³・西野 美里³・大西真由美¹

要 旨 適切な妊婦ケア (ANC: antenatal care) への参加は、周産期合併症、新生児破傷風、新生児死亡、低出生体重の減少に効果があると報告されている。本研究の目的は、ニカラグアのような十分な保健サービスのない状況において、妊娠初期のANCへの参加と妊婦のANCの参加頻度に関連する要因を明らかにすることである。ニカラグア、グラナダ県の33保健施設から4か所の保健施設を無作為抽出し、年齢、教育年数、出産回数、子どもの数、初回ANC参加時の妊娠週数、妊娠中のANC参加回数についてANCカードの記録からデータ収集を行った。調査期間は2000年1月1日から12月31日である。妊婦245人のANCカード記録を分析対象とし、これはグラナダ県の年間妊娠数の4%を占めた。

年齢、子どもの数、出産経験の有無を考慮した重回帰分析モデルにおいて、パートナーがいることが妊娠初期の初回ANCへの参加に、教育年数の長さがANC参加回数に有意に関連した。安定したパートナーがいることおよび教育年数の長さはANC参加の適切な時期や適度な参加を向上させる可能性がある。ヘルスケア提供者は、パートナーのいない女性や教育歴の少ない女性の良好な母子保健行動を促進する必要がある。

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