

Analysis of Factors Associated with Four or More ANC among Pregnant Women in the City of Kita, Mali

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Abstract

The aim of this research is to analyze the factors associated with four or more ANC in pregnant women in the town of Kita, Mali. It involved a sample of 281 women aged 15 - 49 years. The study is of interest because it will identify the most relevant factors associated with 4 or more ANC. A quantitative and analytical study was performed from October to December 2020. Adjusted odds ratios (OR_{aj}) were calculated for variables with a probability value ($p < 0.05$, in bivariate analysis). The study found that 63.7% of women performed 4 or more ANC. Women aged 35 and over had a 61% lower probability of performing the 4 or more ANC than those under 35 (OR_{aj} = 0.39; CI (95%)). Those living alone had a probability 59% lower to perform the 4 or more ANC than those who were in union (OR_{aj} = 0.41; 95% CI). Women who had 3 or more children had a 22% lower probability of performing 4 or more ANC than those with less than 3 children (OR_{aj} = 0.78; CI (95%)). Finally, women who had decision-making power had a 48% lower probability of performing the four ANC and more than those under the tutelage of the head of household (OR_{aj} = 0.52; CI (95%)). Thus, the relevant factors associated with 4 or more ANCs are: age, marital status, number of living children, and who has the power to decide on health care. Taking these relevant factors into account will improve the effectiveness of ongoing ANC programmes in this city.

Keywords

Analysis, ANC, Antenatal Care, Factors, Kita, Mali, Pregnancy, Woman

1. Introduction

Kita, a town in Mali, capital of the Kita circle, in the Kayes region, is located on the Dakar-Niger railway line. Its geographical coordinates are 13°03'00" North, 9°29'00" West. Composed of 13 districts, Kita had, in 2020, a population of 611,404 inhabitants, including 299,974 men and 311,430 women (National Population Department (NPD) 2020). Its growth is exponential, as the city's population has increased from 8516 inhabitants in 1976 to 611,404 in 2020. In terms of health, the town has 2 CSCOMs, 1 referral health center and 8 private clinics. There are 131 health workers, including doctors (11.4%), obstetric nurses (26.4%), nursing assistants (3.0%), midwives (11.4%) and laboratory assistants (8.4%).

Pregnancy is not an illness, but it is a vulnerable period for the mother and her child, warranting appropriate monitoring. Antenatal care is care that a woman receives during pregnancy and childbirth. Most of this care is offered during the antenatal consultation (ANC) (Holland & Stewart, 1990).

In Morocco, women's access to reproductive health care is influenced by several factors that have more to do with their socio-economic condition (standard of living, income, social status) but also with educational and cultural factors (El Hamdani & Cherkaoui, 2013).

In Mali in 2014, eight out of 10 (80%) women aged 15 - 49 who had a live birth in the last five years had at least one antenatal visit with a trained provider (doctor, nurse, midwife, matron). The percentage of women who received prenatal care from a trained provider varies by certain demographic characteristics. It is higher among urban women than among rural women (93% versus 69%). There were differences in birth order: 80% for births of order 1 versus 72% for births of order 6 and above. The proportion of births in which the mother received prenatal care from trained personnel varies according to the level of education: from 71% among women with no education to 95% among those with a secondary level or higher. From a regional perspective, there is a difference between women in the Bamako district (95%) and those in other regions (between 60% and 79%) (Institut National de la Statistique (INSAT), 2014).

Maternal mortality is one of the leading causes of death among women of reproductive age. The risk of a woman dying because of pregnancy or childbirth is one in 140 in some developing countries, while it varies from 1 in 4000 to 1 in 10,000 in industrialized countries. The causes of this maternal mortality are mainly the consequences of difficult deliveries, often due to a lack of antenatal care. Prenatal care helps to maintain the health of the pregnant woman and the fetus, so that at the time of delivery, mother and child are as healthy as possible (Djiguimde, 1997).

In Guinea Conakry, coverage of antenatal care provided by a skilled provider varies from 66% in Labé to 95% in Conakry. It increases from the lowest to the highest welfare quintile, from 66% to 95%. Antenatal consultations by a doctor are more frequent in urban areas (29%) than in rural areas (12%), (Institut Na-

tional de la Statistique (INS), 2019).

The study conducted by S.O. Traore & DOLO, (Traore & DOLO 2020), in the health district of commune V of Bamako, specified that the profile of women without prenatal care was that of homemakers, single women, and uneducated women.

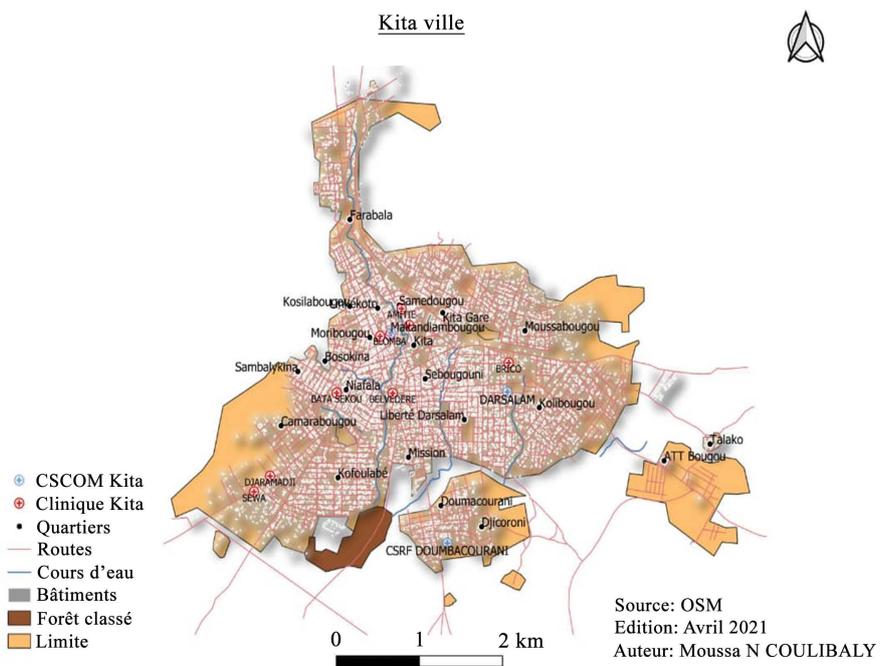
In Mali, most studies on prenatal care are based on a medical approach and not on geography. As geographers, this observation led us to undertake a study entitled: “Factors of access and use of reproductive health care by women in the town of Kita”, as part of a thesis in health geography. Only the prenatal care component is analysed here. The general question is: what are the factors associated with 4 ANC among pregnant women in the city of Kita? To achieve this objective, our argument is based on the general hypothesis that in the city of Kita, “the relevant factors associated with 4 ANC are age, marital status, the number of living children and the role of the person who decides on all care within the household”.

2. Methodology

The data for this research come from a study on access to and use of reproductive health care by women in the town of Kita, as part of a doctoral thesis in health geography at the Institute of University Pedagogy in Bamako.

2.1. Scope of the Study

The town of Kita, capital of the Kita circle, in the Kayes region, is the field of this study (Map 1). Its geographical coordinates are: 13°03'00" North, 9°29'00" West. The city has a surface area of 11.514 km² and a population of 65,908 inhabitants



Map 1. Location of neighbourhoods and health centres in the town of Kita.

in 2020, including 32,295 men and 33,613 women (Direction Nationale de la Population: [DNP, 2020]). It has 13 neighbourhoods, and its city population grew from 8516 inhabitants in 1976. Thus, it has grown at a rate of 10.20% per year from 1976 to 2020. In terms of health, the town has 2 Community Health Centres [CSCOM], 1 Reference Health Centre [CSREF] and 8 private clinics, with 131 health workers distributed as follows: doctors represent 11.4%, obstetric nurses, 26.4%; nursing assistants, 3.0%, midwives, 11.4% and laboratory technicians, 8.4%.

2.2. Sampling Frame for the Questionnaire Survey

2.2.1. Sample Frame for the Questionnaire Survey

We conducted quantitative surveys among households in the target neighbourhoods of the survey:

- Primary units: neighbourhoods
- Secondary units: concessions
- Tertiary units: households in the concessions;

In the first stage, we selected the 13 neighbourhoods of Kita.

In the second stage, 20 concessions were drawn at random from each neighbourhood selected in the first stage.

In the third stage, one household was randomly selected per concession retained in the second stage. The head of the household was subjected to the "Household" module of the questionnaire. The women of the household aged 15 to 49 were subjected to an individual questionnaire in order to collect their characteristics in terms of socio-demographic and economic factors.

2.2.2. Drawing of the Sample

In the tertiary units, the sample was drawn in three stages. In the first stage, all heads of household (260) were interviewed about the members of the unit for which they are responsible. If 1/10th of the heads of household did not take part in the questionnaires for various reasons (refusal, absence), the real size of the sample amounts to at least 234 heads of household who are questioned on the socio-demographic characteristics of the members of their household.

The reference population is calculated on the basis of the fact that the 2009 census revealed an average of 6 persons per household. If this structure has not changed between 2009 and 2019, then the reference population is $260 \times 6 = 1560$ persons.

In the second stage, the study proposed to interview women aged 15 - 49 from this sample of 1560 people. Women in this age group are estimated to be 118,993 out of a total population of 594,584, or 20% of the Kita population. Thus, the female sample size is $1560 \times 0.20 = 312$ women aged 15 - 49. Of these, 281 who had at least one child were subjected to the antenatal care component during the last pregnancy of the questionnaire.

The overall sampling fraction $F = 1560/80,513 = 1/52$.

This quantitative study provided information on the individual characteristics

or factors of the women respondents (age, marital status, level of education, number of living children; socio-economic factors (ease of access to information on the reproductive health care system, economic status of the woman, religious affiliation, identity of the person who decides on care in the household). This description generated: numbers and percentages (**Tables 1-3**).

Table 1. List of explanatory variables.

Variables	Definition and measures	Expected influence
AG	Age: Under 35 (Yes = 0; No = 1)	±
SM	Marital status: woman in union (Yes = 0; No = 1)	±
NI	Education level: female who can read (Yes = 0; No = 1)	±
NEV	Number of living children: Less than 3 children (Yes = 0; No = 1)	±
ACI	Access to information: (Yes = 0; No = 1)	±
STA	Economic status: financially dependent woman (Yes = 0; No = 1)...	±
APR	Religious affiliation: Islam (Yes = 0; No = 1)	±
IDE	Who decides on care: Head of household (Yes = 0; No = 1)	±

Source: Mariam F KONATE, 2020.

Table 2. Individual factors of the women surveyed.

Individual factors			
	Nature	Workforce	Percentage
a) Age: under 35			
	Yes	205	73.0
	No	76	27.0
	Total	281	100.0
b) Marital status: woman in union			
	Yes	247	87.9
	No	34	12.1
	Total	281	100.0
c) Educational level: female who can read			
	Yes	133	47.3
	No	148	52.7
	Total	281	100.0
d) Number of living children: less than 3 living children			
	Yes	202	71.9
	No	79	28.1
	Total	281	100.0

Source: Mariam F KONATE, 2020.

Table 3. Socio-economic factors of the women surveyed.

Socio-economic factors		
Nature	Workforce	Percentage
a) Easy access to the reproductive health system		
Yes	248	88.3
No	33	11.7
Total	281	100.0
b) Economic status: financially dependent woman		
Yes	215	76.5
No	66	23.5
Total	281	100.0
c) Religious affiliation: Islam		
Yes	259	92.2
No	22	7.8
Total	281	100.0
d) Identity of the care manager: Head of household		
Yes	181	64.4
No	100	36.6
Total	281	100.0

Source: Mariam F KONATE, 2020.

2.3. Analytical Part

The dependent variable chosen in this research is the number of ANC's performed: 4 ANC's and more (Yes = 0, No = 1). The analytical part consisted, through bivariate analysis, in the search for associations between this level of the dependent variable and the predictor factors (independent variables). CSPRO software was used to encode the data and SPSS to perform the bivariate analyses. For this purpose, the PEARSON Chi-square test, at the 5% risk threshold, was used according to the usual conditions for each test (Ancelle, 2006). This stage was decisive in choosing the variables to be included in the model, under the condition of independence of each of these variables. At this stage, if two variables were linked, one of them was retained for the logistic regression. For all the variables retained, the adjusted odds ratio or adjusted Odd ratio (ORaj) was calculated, in accordance with its conditions of use.

In addition, all variables were dichotomized (binary variable) according to the requirements of logistic regression. Thus, the number zero (0) corresponded to "Yes" and the number one (1) to "No".

Logistic regression was used to generate the factor model (independent variables), by calculating adjusted ORs. The variables to be included in the model were selected using the bottom-up Wald method: stepwise selection method with entry test based on the significance statistic (with $p < 0.2$) and with deletion

test based on the probability of the Wald statistic. The regression equation is as follows:

$$P(Y = 1/X_1, X_2, \dots, X_k) = 1 / \left(1 + e^{\beta_0 + \sum_{i=1}^k \beta_i X_i} \right)$$

Goodness of fit was checked using the Hosmer-Lemeshow test. Only those variables that have a statistically significant effect on the use of the dependent variable were retained in the model. The independent variables listed above are reported in **Table 1**.

3. Analysis of the Results

3.1. Descriptive Analysis

3.1.1. Characteristics of the Women Surveyed

The individual characteristics or factors of the women surveyed are shown in **Table 2**.

Analysis of this table shows that 73.0% of women are under 35 years of age. This situation can be related to the youth of the Malian population. With regard to their marital status, the study indicates that most women (87.9%) are in union. Union or marriage is an almost universal institution in Mali, as the status of married woman commands the respect of society. It can be seen that 52.7% of women can neither read nor write. This result is a reminder that, despite major efforts made by the Malian government in the field of education, the illiteracy rate is still high even in some towns such as Kita. As for the number of living children, most women (71.9%) have fewer than three children. Measures of the number of living children are often imprecise or under-registered.

The socio-economic factors of the women surveyed are recorded in **Table 3**.

Analysis of this table shows that 88.3% of women have easy access to information on the reproductive health system. This result supports the efforts made by the authorities in charge of reproductive health in the town of Kita. Nevertheless, 11.7% of women felt that they had difficulty accessing information. They mentioned three main reasons, namely lack of interest (69.7%), lack of information (27.3%) and opposition from their spouse (3.0%).

This shows that most women (76.5%) are not financially independent. Under these conditions, they are likely to have difficulty in establishing control over their fertility, since most often, as housewives; they are subject to the will of the person who provides for their needs.

The study noted that 92.2% of the women declared themselves Muslims compared to 7.8% who were Christians. This proportion of Christians is relatively high because Kita is considered the main city of Catholicism in Mali and a place of annual pilgrimage since 1966.

With regard to who decides on all care in the household, we note that the heads of household represent 64.4% against 35.6% for women who decide on their own.

3.1.2. Prenatal Consultations

During antenatal visits, most women (77.6%) were informed about the signs of danger related to pregnancy, as opposed to 22.4% who said the opposite. The main signs cited were high-risk delivery (72.9%), risk of stillbirth (8.7%), risk of miscarriage (8.7%), risk of congenital malformation (5.2%) and risk of long labor during delivery (2.7%). The risk of mother-to-child transmission of HIV was cited by 0.9% of women. The reasons given by women for not being informed about the danger signs of pregnancy are numerous (Annex 1: **Figure 1**).

The main reasons were lack of information (24.6%), interest (20.3%) and time (8.7%).

The data on the number of prenatal consultations (PCN) carried out are shown in Annex 1 (**Figure 2**).

It can be seen that a large proportion of women (63.7%) carried out 4 or more ANC, compared with 36.3% who did less. For this category, the reasons given were the normal course of the pregnancy (35.3%), inexperience (ignorance of the need for prenatal visits to ensure mother-child health: 3.7%), insufficient income to bear the costs of consultations (13.7%), lack of time and opposition from the spouse (9.8%), and shame because of advancing age and the onset of the pregnancy (5.9%).

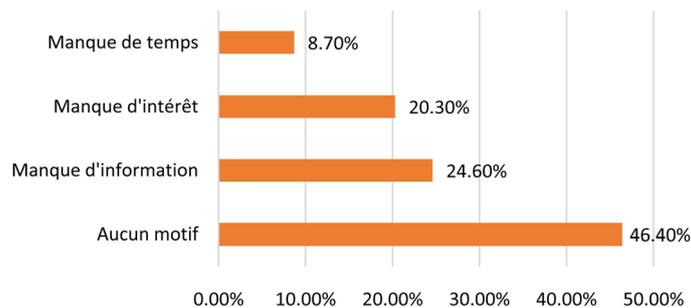


Figure 1. Nature of the danger signs, during pregnancy, mentioned by women. Source: Mariam F KONATE, 2020.

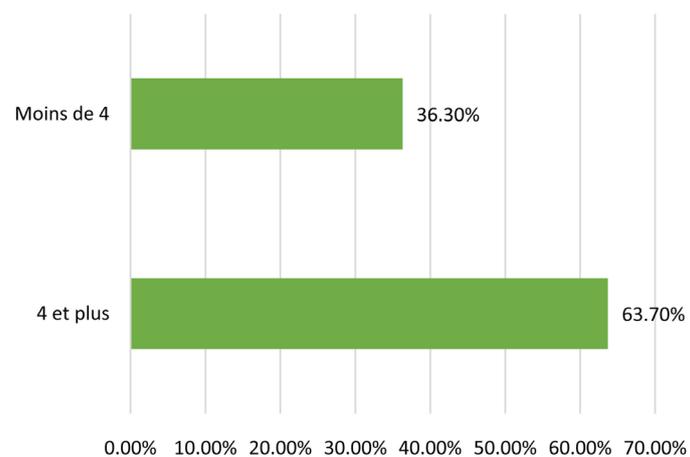


Figure 2. Number of ANC declared during the last pregnancy by women. Source: Mariam F KONATE, 2020.

The following question was asked to the women: During prenatal visits, did you have any medical examinations? The different answers are recorded in Annex 1 (**Figure 3**).

Thus, 95.0% of the women took the blood test, 97.7% of them took anti-malarial drugs and between 88.6% and 95.7% of the women took measurements of blood pressure, weight, height and uterine height. Most of the medical examinations took place at the CSCOMs (72.2%) and 15.3% and 10.7% at the CSREFs and private clinics respectively. This result confirms the thesis that public health centers are women's main recourse in the field of reproductive health. A qualified provider provided this antenatal care: doctor, midwife (55.5%), matron (46.6%) and by unqualified personnel: parents (2.8%).

In relation to the cost of prenatal consultations, we note that 44.8% of women find this cost high or even expensive (Annex 1: **Figure 4**).

For low-income households, prenatal consultations are expensive because of the cost of the ANC booklet and the costs of medical examinations.

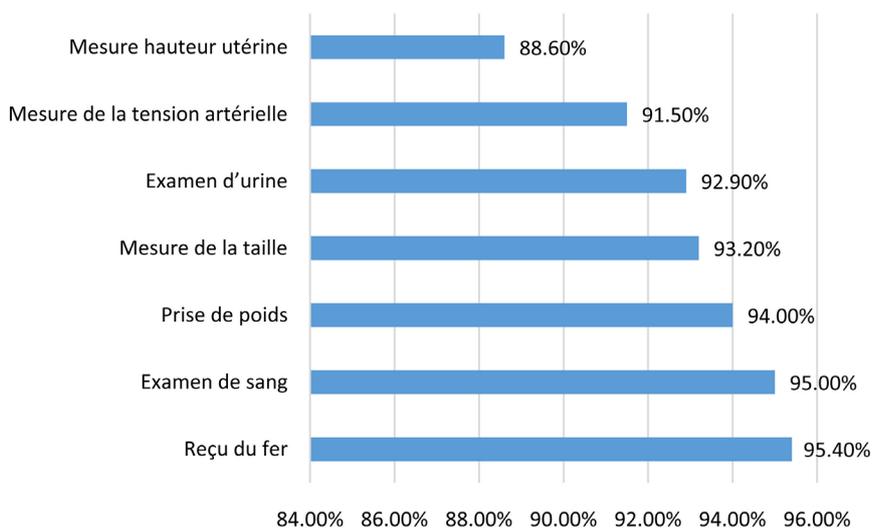


Figure 3. Women according to the type of medical examination performed during antenatal consultations. Source: Mariam F KONATE, 2020.

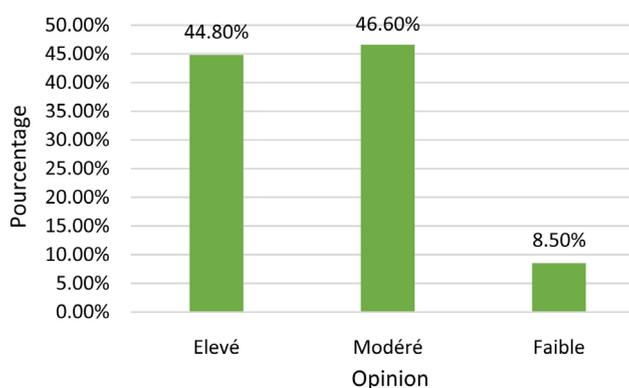


Figure 4. Women's opinions on the cost of ANC during the last pregnancy. Source: Mariam F KONATE, 2020.

For tetanus prevention, the study found that 91.8% of women were vaccinated. Vaccination during pregnancy can have 3 objectives:

- To protect the mother whose immunity has been modified during pregnancy;
- To protect the foetus from possible foetopathy and/or obstetric complications
- To confer passive immunity to the newborn.

3.2. Bivariate Analysis

The results of the bivariate analysis between women's individual factors and the number of ANC performed (4 and more) are shown in **Table 4**.

The results of the bivariate analysis showed no statistically significant relationship between the probability of performing the number of ANCs performed (4 and more) and the level of education. Indeed, at the 5% threshold, for a $ddl = 1$,

Table 4. Women's individual factors according to the number of ANC performed (4 and more).

Individual factors	Number of NPCs performed (4 and more)					
	No		Yes		Total	
	Workforce	%	Workforce	%	Workforce	%
a) Age: under 35						
Yes	90	43.9	115	56.1	205	100.0
No	12	15.8	64	84.2	76	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 18.951, $ddl = 1$, at 5% threshold, $p = 0.000$.						
b) Marital status: woman in union						
Yes	93	37.7	154	62.3	247	100.0
No	9	26.5	25	73.5	34	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 12.616, at the 5% threshold, $ddl = 1$. $p = 0.0204$.						
c) Number of living children: less than 3 living children						
Yes	97	48.0	105	52.0	202	100.0
No	5	6.3	74	93.7	79	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 42.688, $ddl = 1$, at 5% threshold, $p = 0.000$						
d) Educational level: female who can read						
Yes	54	40.6	79	59.4	133	100.0
No	48	32.4	100	67.6	148	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 2.022, $ddl = 1$, at 5% threshold, $p = 0.154$.						

Source: Mariam F KONATE, 2020.

the calculated chi-square value (2.022) is <its theoretical value (3.84). Also, the probability value $p = 0.154$ is >0.05 . The level of education was not retained for the multivariate analysis.

On the other hand, the analysis revealed the existence of statistically significant associations between the probability of performing the number of ANC (4 and more) and the following variables:

- Age, at the 5% threshold, for a $ddl = 1$, the calculated value of Chi-square = 18.951 is significantly higher than its theoretical value (3.84). As well, the value of the probability $p = 0.000$ is <0.05 ;
- Marital status, at the 5% threshold, for a $ddl = 1$, the calculated value of Chi-square = 42.688 is $>$ its theoretical value (3.84). Thus, the value of the probability $p = 0.0205$ is <0.05 ;
- The number of living children, at the 5% threshold, for a $ddl = 1$, the calculated value of Chi-square = 42.688 is $>$ its theoretical value (3.84). As such, the probability value $p = 0.000$ is <0.05 .

The results of the bivariate analysis between women's socioeconomic factors and the number of ANC performed (4 and more) are reported in **Table 5**.

The bivariate analysis shows that the number of ANC performed during pregnancy is not statistically significantly related to the following variables:

- Access to information on the reproductive health system, at the 5% threshold, for a $ddl = 1$, presents a calculated value of Chi-square = 0.58184 $<$ to theoretical value (3.84). Its probability value $p = 0.446$ is >0.05 ;
- Religious affiliation, at the 5% threshold, for a $ddl = 1$, has a calculated chi-square value (0.036) $<$ its theoretical value (3.84). Its probability value $p = 0.850$ is >0.05 . These two independent variables were not retained for the multivariate analysis.

On the other hand, the number of ANC performed during pregnancy has statistically significant associations with the following variables:

The economic status of the woman, at the 5% threshold, for a $ddl = 1$, presents a calculated value of Chi-square (8.491) clearly higher than its theoretical value (3.84). Moreover, its probability value $p = 0.004$ is <0.05 .

The identity of the person who decides on all the care in the household, at the 5% threshold, for a $ddl = 1$, has a calculated Chi-square value (8.491) that is significantly higher than its theoretical value (3.84). Furthermore, its probability value $p = 0.004$ is <0.05 .

3.3. Multivariate Analysis

The results of the multivariate analysis between the selected independent factors and the number of ANC performed (4 and more) by women during pregnancy are shown in **Table 6**.

The multivariate analysis showed no statistically significant relationship between the woman's economic status and the number of ANCs performed, i.e. 4 or more. Indeed, the probability value $p = 0.063$ is >0.05 (at the 5% threshold).

Table 5. Women’s socio-economic factors by number of ANC performed (4 or more).

Factors socio-economic	Number of NPCs performed (4 and more)					
	No		Yes		Total	
	Workforce	%	Workforce	%	Workforce	%
a) Easy access to information on the SR system						
Yes	92	37.1	156	62.9	248	100.0
No	10	30.3	23	69.7	33	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 0.581 84, ddl = 1, at 5% threshold. <i>p</i> = 0.446						
b) Religious affiliation: Islam						
Yes	89	34.4	170	65.6	259	100.0
No	8	36.4	14	63.6%	22	100.0
Total	97	34.5	184	65.5	281	100.0
Calculated Pearson Chi-square = 0.036 for ddl = 1, at the 5% threshold. <i>p</i> = 0.850						
c) Economic status: financially dependent woman						
Yes	88	40.9	127	59.1	215	100.0
No	14	21.2	52	78.8	66	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 8.491, ddl = 1, at the 5% threshold. <i>p</i> = 0.004						
d) Identity of the caretaker: Head of household						
Yes	78	43.1	103	56.9	181	100.0
No	24	24.0	76	76.0	100	100.0
Total	102	36.3	179	63.7	281	100.0
Calculated Pearson Chi-square = 10.1561, ddl = 1, at 5% threshold, <i>p</i> = 0.001						

Source: Mariam F KONATE, 2020.

Table 6. Results of the multivariate analysis, at the 5% threshold, of the influence of women’s factors on the number of ANC performed.

Factors	Adjusted Odds Ratios (ORaj)	<i>p</i> > Z	<i>a</i> = 5%
a) Age: under 35			
Yes	reference	reference	reference
No	0.39	0.015	**
b) Marital status: woman in union			
Yes	reference	reference	reference
No	0.41	0.047	**
c) Number of living children: less than 3 living children			
Yes	reference	reference	reference
No	0.78	0.000	**

Continued

d) Identity of the person who decides on all care: head of household			
Yes	reference	reference	reference
No	0.52	0.03	**
e) Economic status: financially dependent woman			
Yes	reference	reference	reference
No	0.51	0.063	ns

** : significant influence at the 5% level. ns = non-significant influence at the 5% level. Source: Mariam F KONATE, 2020.

On the other hand, the other factors (age, marital status, number of living children and identity of the person who decides on all care in the household) have statistically significant associations with the probability of women performing 4 or more ANC during pregnancy.

Thus, women aged 35 years and older had a 61% lower probability of performing 4 or more ANCs than those under 35 years of age, and this was statistically significant (OR_{aj} = 0.39; 95% CI).

In addition, women living alone (not in union) were 59% less likely to perform 4 or more ANCs than those in union, and this was statistically significant (OR = 0.41; 95% CI).

In addition, women who had 3 or more children were 22% less likely to perform 4 or more ANCs than those with fewer than 3 children, and this was statistically significant (OR_{aj} = 0.78; 95% CI).

Similarly, women who decided on all care on their own were 48% less likely to perform 4 or more ANCs than those who depended on the head of household, and this was statistically significant (OR = 0.52; 95% CI).

4. Discussion of the Results

After bivariate analysis and multivariate regression, the factors found to have no influence on the number of ANCs were classified into individual factors, namely the woman's level of education, and socio-economic factors, namely easy access to information about the reproductive health system, the woman's economic status and religious affiliation.

With regard to the lack of influence of the woman's level of education and economic status on the number of prenatal visits during the last pregnancy, this result has been contradicted by most of the studies conducted in this area. Thus, in the health district of commune V of Bamako, the profile of women without prenatal care was that of housewives (OR = 2.5 [2.0 - 3.4]), single women (OR = 2.3 [1.8 - 2.8]), and uneducated women (OR = 1.1 [0.9 - 1.3]) (Traore et al., 2020: op. cit.).

Also, in the health district of Maroua II, Cameroon, the individual factors associated with non-attendance of ANC services were female illiteracy (p value < 0.001) and low household income (p value = 0.045 and OR = 1.307 (1.257 -

2.597) (Boukar, 2018).

Again, the spouse's education significantly influenced the number of prenatal visits ($p = 0.003$). Thus, the probability of women whose spouse was educated to consult at least three times during pregnancy was 3.14 times greater than those whose spouse was not educated (Djiguimde, 1997).

In addition, women with secondary education or more were 1.83 times more likely to attend antenatal visits than those with less education (ORaj 1.83; CI (95%); 1.06 - 3.15) (Brown & Mukhwana, 2008).

Similarly, factors associated with receiving antenatal care were higher education (OR = 3.428, 95% CI; 2.473 - 4.751; p -value 0.001) and household wealth (OR 1.656, 95% CI; 1.484 - 1.855, p -value 0.001) and low parity (OR = 1.214, 95% CI; 1.035 - 1.423; p -value 0.017) (Mustafa & Mukhtar, 2010).

The lack of influence of the variable ease of access to information on the number of ANC is also surprising. Indeed, exposure to the media is considered a critical factor in performing ANC (Bonono & Ongolo-Zogo, 2012).

As much, the factors negatively associated with the use of ANC services (4 ANC) were belonging to ethnic minority groups with a lower level of education, doing informal work, having a lower income, but above all having less knowledge of the services and not receiving any financial support from the husband. In particular, financial support from the husband was found to be important in improving the use of antenatal care services by women in rural areas (Ha & Thi, 2015).

In this research, individual factors found to influence the number of ANCs in a statistically significant way were age, marital status, number of living children.

Our study showed that women aged 35 and over were 61% less likely to perform all 4 or more ANCs than those under 35, and this was statistically significant (ORaj = 0.39; 95% CI). Similarly, women living alone (not in union) were 59% less likely to perform all four or more ANCs than those in union, and this was statistically significant (ORaj = 0.41; 95% CI).

This result is supported by the fact that late PNC1 was more common in patients under 18 years of age or over 34 years of age (Ndiaye & Dione, 2005).

Also, lack of follow-up was 2.29 times higher in adolescent women than in adult women (OR = 2.29 [1.54 - 3.41]), 4 times higher in women living alone than in those living in unions (OR = 4.00 [2.05 - 7.79]) (Maleya & Kakudjiluhet 2015).

Our research found that women with 3 or more children were 22% less likely to perform all 4 or more ANCs than those with fewer than 3 children, and this was statistically significant (ORaj = 0.78; CI (95%).

Thus, one of the factors associated with receiving antenatal care was low parity (OR = 1.214, 95% CI; 1.035 - 1.423; p -value 0.017) (Mustafa & Mukhtar, 2010: op. cit.).

Similarly, in the health district of Maroua II, Cameroon, one of the individual factors associated with ANC attendance was multiparity (p value = 0.024 and OR = 0.589 with CI = 1.257 - 2.597) (Boukar, 2018: op. cit.).

Moreover, multiparous women living in peri-urban areas were the least followed up in ANC (El Hamdani & Cherkaoui, 2013).

In addition, the number of living children is a significant determinant of health service use. It can, in fact, influence the use of antenatal care. Women who have few or no children yet have difficulty using antenatal care. Those who were in their first pregnancy make the most use of care; they represented 40% of all women who made the prenatal visit, compared with 34.1% for those with two to three children, 22.5% for those with four to five children and 3.3% for women who had given birth six times or more. In fact, multiparous women use obstetric care services less because their previous pregnancy experiences lead them to think that they can do without (Eloundou-Enyegue & Hirsch, 2017).

In our study, the only socio-economic factor found to influence the number of ANC was who decided on all the care in the household.

Our research found that women who decided on all care on their own were 48% less likely to perform 4 or more ANC than those who depended on the head of the household, and this was statistically significant (OR_{adj} = 0.52; 95% CI).

This result seems unexpected because the woman's financial dependence is considered a major obstacle to antenatal care (Gandzien, 2007: pp. 54-168).

Our result could be explained by the dominant position of the head of the household, as in Mali he is the manager of the household assets. Even if women have personal resources, their income is often very modest compared to that of the head of household. Therefore, her involvement in antenatal care can only be a favourable factor.

5. Conclusion

This study focused on the analysis of factors associated with four or more ANC among pregnant women in the city of Kita, Mali. The study has some limitations, as the data collected on ANC attendance was largely self-reported by the women surveyed, which may have led to observational bias despite the efforts of the investigators to minimize this source of error.

The methodological approach was based on a literature search, a questionnaire survey of a sample of 281 women followed during their last pregnancy and a linear logit analysis. The study revealed that a significant proportion of women (63.7%) performed 4 or more ANCs compared to 36.3% who performed less. Factors such as education level, access to information and religious affiliation were not statistically significantly associated with 4 or more ANC. In contrast, age, marital status, number of living children and identity of the caregiver in the household were statistically significantly associated with 4 ANC. These results confirm our working hypothesis, namely: "the relevant factors associated with 4 ANC are age, marital status, number of living children and the role of the person who decides on all care within the household". Determining these relevant socio-demographic and economic factors is an essential step for the implementation of specific programmes to boost ANC in the city of Kita. In the future, this

research on factors associated with 4 or more ANC should be supported by a qualitative study on women's perceptions of ANC.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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