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Research Article

Factors associated with the non-attendance at minimum eight antenatal contacts according to the 2016 WHO recommendations

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Abstract

Objective: To evaluate the factors associated with the non-attendance at a minimum of eight antenatal contacts (ANCs).

Methods: This analytical cross-sectional study was carried out between 1st March and 31st May 2021. All parturients who attended at a minimum of one ANC were recruited. The main variables recorded included maternal age and parity, educational level, marital status, partner's educational level, monthly income, gestational age at booking and at delivery, total number of ANCs and antenatal care provider. Variables of women with <8 ANCs were compared to those of women with ≥8 ANCs. Fisher exact test, t-test and logistic regression were used for comparison. P<0.05 was considered statistically significant.

Results: Of 458 women, 38 (8.3%) attended at ≥8 ANCs. The factors associated with the attendance at <8 ANCs were pregnancy followed up by a nurse (aOR 6.56, 95%CI 1.30-33.04, P=0.023), booking after 16 weeks of gestation (aOR 5.79, 95%CI 2.08-16.09, P <0.001), very low monthly income (aOR 3.54, 95%CI 1.71-7.32, P <0.001) and partner's educational level < university (aOR 2.86, 95%CI 1.01-8.12, P=0.048).

Conclusion: The magnitude of these factors should be reduced if we want to increase the proportion of pregnant women who attended at eight ANCs or more.

Keywords: Attendance at less than eight antenatal contacts: Booking after sixteen weeks of gestation; Pregnancies followed up by a nurse; Very low monthly income.

Introduction

Each pregnancy is associated with increased risk of morbidity and mortality for both the mother and her fetus. Indeed, some deathly diseases that should be early diagnosed and treated such as hypertensive diseases or fatty degeneration of the liver can occur during this event. In 2015, 303 000 maternal deaths

were recorded worldwide,[1] as well as 2.6 million stillbirths.[2] The vast majority of these deaths occurred in developing world.[3] Two thirds of maternal deaths happened in sub-Saharan Africa.[1] In the UK, the maternal mortality ratio (MMR) was 7/100 000 live births in 2017, while in the same year in sub-Saharan Africa it was 525/100000 live births.[4] In Cameroon in 2018, the ratio was estimated to about 474/100 000 live births.[5]

Antenatal contacts (ANCs) are visits offered to pregnant women to prevent or early diagnose and treat any anomaly or condition that may jeopardize the wellbeing of the mother or of the fetus before, during or after the delivery.[1] Development Goal 3 (target 3.1) was intended to reduce the global MMR to less than 70/100 000 live births by the year 2030.[6] The practice of four ANCs as recommended by WHO before 2016 did not reduce the morbi-mortality rates.[7] Since adequate and timely use of ANC services are associated with a reduction of maternal and perinatal morbidities and mortalities, WHO recommended in 2016 at least eight ANCs at respectively <12, 20, 26, 30, 34, 36, 38 and 40 weeks of gestation.[8] It has been proven that the proportion of adequate diagnosis and treatment of hypertensive diseases in pregnancy increases significantly in women with ≥8 ANCs.[9] In developing world, the proportion of women with ≥8 ANCs before delivery varies between 1.4% in Zambia[10] and 26.1% in Nigeria.[11] A rate as high as 41.9% has been noticed in Ghana.[12] Some known factors associated with poor attendance at visits are lower education, financial constraints, larger households and lack of women empowerment.10–13.

Despite the frequent sensitization of women and health care providers, we observed in our daily practice of deliveries that only few women attended at ≥8 ANCs. Some other factors that can explain this low attendance at ANC might exist in our country. Identifying these factors will help us in proposing some solutions to solve the problem. No study has been carried out in our environment to understand this phenomenon, hence this study which aimed at identifying the factors associated with the attendance at <8 ANCs.

Methods

This analytical cross-sectional study was carried out between 1st March and 31st May 2021 in two University Teaching Hospitals. Parturients who attended at ≥1 ANC were recruited. A written informed consent was obtained from each woman or her relatives. This study was approved by the two institutional ethics committees. The main variables recorded included maternal age and parity, educational level, marital status, occupation, place of living (urban or rural), gestational age at first consultation (confirmed with an ultrasound scan realized before 20 weeks of gestation), total number of ANCs, care provider, gestational age at delivery and regimen of intermittent preventive treatment received (using sulfadoxine-pyrimethamine). Women who never attended at any ANC, those with unavailable appointment book and those who refused to participate were excluded. The necessary minimum sample size was calculated as needing at least 90 women using the following formula: $N=P\times(1-P)\times(Z\alpha/D)^2$ [14] where P is the percentage of women with at least eight ANCs in a recent study in Cameroon (6.2%)[15], Zα=1.96 corresponding to a type I error of 5% and D=0.05 is the degree of precision.

Data were analyzed using SPSS 24.0. Data of women of group A (women with <8 ANCs) were compared to those of group B (women with ≥8 ANCs). Fisher's exact test was used to compare categorical variables and t-test to compare continuous variables. We used odds ratios with their 95% confidence intervals (CIs) to present the comparison between the two groups. Logistic regression analysis was used to control for confounders. P<0.05 was considered statistically significant.

Results

Of 549 parturients, the appointment book was unavailable for 91 (16.6%) women, hence, informations about ANCs were available for 458 women (83.4%). A total of 180 (32.8%) women did no ANC, 278 (50.6%) had at least one ANC done, but 27 (4.9%) women refused to participate. The remaining 251 (45.7%) parturients were included in this survey. A total of 38 (8.3%) of 458 parturients attended at ≥8 ANCs while 420 (91.7%) had <8 ANCs done. Nevertheless, 358 of 458 (78.2%) parturients attended at ≥4 ANCs. Some sociodemographic characteristics of the population under study are given in Table 1. The number of ANCs of all women varied between 1 and 10, with a median of 5.0 (4.0-7.0). Although the mean maternal age in group A was similar to that of group B (P=0.115), women aged 30 to 34 were significantly less found in group A (43 or 20.2% vs. 15 or 39.5%, OR 0.39,

95%CI 0.19-0.81, P=0.011). Women followed up by nurses were found more in group A (87 or 40.9% vs. 2 or 5.3%, OR 12.43, 95%CI 2.92-52.98, P<0.001). With regards to monthly income, women with income <90 US dollars were found more in group A (145 or 68.1% vs. 14 or 36.8%, OR 3.66, 95%CI 1.78-7.51, P<0.001). As regards gestational age at booking, women who were booked after 16 weeks gestation were found more in group A (119 or 55.9% vs. 7 or 18.4%, OR 5.60, 95%CI 2.36-13.30, P<0.001) (Table 2).

Although there was no statistical difference as concerns mean gestational age at delivery (P=0.060), women who delivered prematurely (<37 weeks gestation) were more found in group A (28 or 13.2% vs. 1 or 2.6%, OR 5.60, 95 %CI 0.74-42.46, P=0.043). We found no association between twin pregnancies and <8 ANCs (14 or 6.6% vs. 2 or 5.3%, P=0.522). Women who received less than three doses of IPT were found more in group A (85 or 39.9% vs. 4 or 10.5%, OR 5.64, 95%CI 1.93-16.48, P<0.001). Single women were observed more in group A (102 or 47.9% vs. 15 or 39.5%), but the difference was statistically insignificant (P=0.217). Also, women residing in rural areas were found more in group A (14 or 6.6% vs. 1 or 2.6%), but the difference was also statistically insignificant (P=0.304). As regards educational level, women who never attended university level were significantly observed more in group A (116 or 54.5% vs. 11 or 29.0%, OR 2.93, 95%CI 1.38-6.22, P=0.003). Also, women who used to go to hospitals with commercial motorbikes were significantly found more in group A (38 or 17.8% vs. 1 or 2.6%, OR 8.03, 95%CI 1.07-60.39, P=0.008). We observed no association between history of cesarean section and attendance of <8 ANCs (49 or 23.0% vs. 10 or 26.3%, P=0.397). Women with unintended pregnancies were found more in group A (35 or 16.4% vs. 1 or 2.6%, OR 7.27, 95%CI 0.97-54.79, P=0.014). After logistic regression analysis, the factors associated with the non-attendance at a minimum of eight ANCs according to the 2016 WHO recommendations are shown in Table 3.

Table 1: Some sociodemographic characteristics of the population under study

Variables	Group A women (n = 213) Mean ± SD (range)	Group B women (n=38) Mean ± SD (range)	OR	95% CI	P-value
Mother's age (y)	28.8 ± 6.7 (16-43)	30.6 ± 5.0 (21-40)	-	-	0.115
Parity	3.1 ± 2.0 (1-9)	3.0 ± 1.9 (1-8)	-	-	0.775
GA at first visit (w)	16.8 ± 6.0 (6-39)	10.6 ± 4.0 (5-19)	-	-	<0.001
Number of ANC	4.6 ± 1.6 (1-7)	8.4 ± 0.7 (8-10)	-	-	<0.001
GA at delivery (w)	38.5 ± 2.2 (30-44)	39.2 ± 1.4 (35-42)	-	-	0.060
Number of IPT regimen	2.7 ± 1.2 (0-6)	3.6 ± 1.0 (2-5)	-	-	<0.001
BMI	25.6 ± 4.4 (17.0-38.7)	26.3 ± 4.3 (18.7-39.9)	-	-	0.366
Student	61 (28.6%)	5 (13.2%)	2.65	1.01-7.10	0.031
Partner's educational level < university	108 (50.7%)	8 (21.1%)	3.86	1.69-8.80	<0.001
Delivery <37 weeks	28 (13.2%)	1 (2.6%)	5.60	0.74-42.46	0.043

OR: Odds ratio, CI: Confidence interval, GA: gestational age, ANC: Antenatal care, IPT: Intermittent preventive treatment against malaria, BMI: Body mass index.

Table 2: Gestational age at booking in the population under study.

Gestational age (weeks of gestation)	Group A women (n=213) N (%)	Group B women (n=38) N (%)	OR	95%CI	P-value
< 12	38 (17.8)	23 (60.5)	0.14	0.07-0.30	<0.001
12-16	56 (26.3)	8 (21.1)	1.34	0.58-3.09	0.322
>16-<20	54 (25.4)	7 (18.4)	1.50	0.62-3.61	0.242
≥ 20	65 (30.5)	0 (0)	-	-	<0.001

OR: Odds ratio, CI: Confidence interval.

Table 3: Factors associated with the realization of less than eight antenatal visits.

Variables	OR	95%CI	P-value	aOR	95%CI	P-value
Pregnancy followed up by a nurse	12.43	2.92-52.98	<0.001	6.56	1.30-33.04	0.023
Booking after 16 weeks of gestation	5.60	2.36-13.30	<0.001	5.79	2.08-16.09	<0.001
Monthly income <90 US Dollars	3.66	1.78-7.51	<0.001	3.54	1.71-7.32	<0.001
Partner's education < university	3.86	1.69-8.80	<0.001	2.86	1.01-8.12	0.048
Motorbike as transportation means	8.03	1.07-60.39	0.008	6.16	0.72-33.04	0.098
Delivery <37 weeks	5.60	0.74-42.46	0.043	5.07	0.58-44.49	0.143
Student	2.65	1.01-7.10	0.031	3.23	0.92-11.34	0.067
Unintended pregnancy	7.27	0.97-54.79	0.014	2.77	0.30-25.09	0.365
Educational level < university	2.93	1.38-6.22	0.003	0.90	0.34-2.43	0.844

OR: Odds ratio, CI: Confidence interval, aOR: adjusted odds ratio, US: United States.

Discussion

Our proportion of women who attended at ≥8 ANCs was 8.3%. The factors associated with the infrequent attendance at ANCs were pregnancy followed up by a nurse, booking after 16 weeks of gestation, very low monthly income and partner's educational < university level. Our proportion of women with ≥8 ANCs (8.3%) is lower than the 26.1% and 41.9% observed in Nigeria and Ghana respectively,[11,12] but close to the 8% rate observed in Benin.[16] However, it is higher than the 1.4% observed in Zambia.[10] We found no association between <8 ANCs and maternal age, parity, residence, marital status or number of gestations. These findings are in contrast with some studies that noticed that single women and those residing in rural areas attended at less ANCs.[11,13] Pregnant women followed up by nurses had significantly <8 ANCs done. Some nurses might not be aware of the new WHO recommendations of at least eight ANCs. They should be trained on these new recommendations. Moreover, they might not emphasize enough on the importance of frequent ANCs. Women who were booked after 16 weeks gestation had significantly <8 ANCs done, even after multivariate analysis. Booking in the second trimester has been associated with the attendance at <8 ANCs in Nigeria.[11] In our survey, 30.5% women with <8 ANCs started ANC after 20 weeks, hence missing two ANCs scheduled by WHO. In our environment some women realize they are pregnant only with fetal quickening that usually occur between 16 and 20 weeks gestation. At this moment they start to seek financial means to achieve ANCs. Physicians should counsel women to consult when they have a missed period, in order to confirm an eventual pregnancy and plan ANCs.

Late booking in our survey was also associated with poor prevention against malaria, since those women took significantly less regimens of sulfadoxine-pyrimethamine as intermittent preventive treatment (IPT) against malaria (Table 1). A previous survey in our unit revealed that at least three regimens of IPT are necessary to prevent malaria in pregnancy.[17] Women with very low monthly income (<90 US dollars) significantly attended at <8 ANCs, even after logistic regression. Since ANCs are not free of charge

in our country, some of these women, in a country with a minimum wage of about 60 US dollars, might lack financial means to perform laboratory tests and to attend antenatal visits frequently (average four to eight US dollars per contact). The government should render antenatal visits free of charge to encourage these women to use the ANC services. It has been noticed that women with financial constraints had infrequent attendance at ANCs.[11,13,18,19] Less educated women had significantly <8 ANCs performed after univariate analysis, as observed in some low- and middle-income countries[13] These women might not understand the importance of antenatal visits. But there was no association anymore in our survey after logistic regression. Nevertheless, women whose partner's educational level was less than university had significantly <8 ANCs done, even after logistic regression. This might be attributed to the fact that in our environment, the male partner plays an important role in decisions making in the family and in providing money for ANCs. Women should be empowered in decision making, since it has been associated with more ANC attendance.[10] Men should be sensitized through media on the importance of ANCs.

Women who used commercial motorbike as only available transportation means had <8 ANCs done, even after logistic regression (aOR 6.16), though the difference was statistically insignificant (P=0.098). The absence of significance might be due to our small sample size (39 women only used this means). The association, if any, might be attributable to the lack of comfort observed with this transportation means, especially for women in the third term of pregnancy, and therefore infrequent attendance at ANCs. Women who delivered <37 weeks significantly attended at <8 ANCs after univariate analysis. This can be explained by the fact that two ANCs are scheduled after 37 weeks (at 38 and 40 weeks) and these women could have done only the six ANCs scheduled before 37 weeks. But after multivariate analysis, there was no association (adjusted *p* value 0.143). This might be due to the small sample size, since only 29 women delivered <37 weeks gestation.

Student significantly attended at <8 ANCs after univariate analysis. They might have chosen to attend schools and may lack time for antenatal visits. This association disappeared after multivariate analysis. The lack of significance might be due to the small sample size. Finally, women with unintended pregnancies had significantly <8 ANCs done after univariate analysis, but not after multivariate analysis. Some of these pregnant women might be hesitating between pregnancy termination and conservation. The limitations of our study are firstly our small number of women, especially in group B (n=38). Furthermore, our proportion of women with ≥8 ANCs might be different from what found given that we could not have all appointment books. Finally, we cannot be certain of the answers given by women as regards the real amount of their monthly income. Further studies with larger sample size should be conducted in low- and middle-income countries to verify our findings.

Conclusion

The factors associated with the attendance at <8 ANCs were pregnancy followed up by a nurse, booking after 16 weeks of gestation, very low monthly income and partner's educational level <university. We should reduce the magnitude of these factors if we intend to increase the proportion of pregnant women who can attend at eight ANCs or more.

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None.

Conflict of interest

The authors have no conflicts of interest to declare.

Authors' contribution

EN contributed to study conception, study design, and drafting the manuscript; GE contributed to data acquisition and analysis, and to manuscript writing; JF contributed to data acquisition and to critical review of the manuscript. All the authors approved the final manuscript.

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