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Original Research Article

Determinants of antenatal and postnatal care service utilization in Burundi: analysis of the 2016-2017 Burundian demographic and health survey

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ABSTRACT

Background: Access to antenatal care and postnatal care services has a great deal of impacts on major causes of high maternal, neonatal and child mortality rates. This study was aimed to identify factors affecting the use of antenatal care (ANC) and postnatal care (PNC) services.
Methods: The study used data from the nationally representative 2016-2017 Burundi demographic and health survey (DHS). A total of 8,660 mothers who gave birth within five years preceding the 2016-2017 Burundi DHS were included in this study. Logistic regression statistical analyses were used to identify factors associated with the use of the first ANC visit, the use of 4 ANC services and the use of PNC services in Burundi.
Results: Using logistic regression the determined factors such as birth order (AOR 1.64; 95% CI 1.51-1.73), place of delivery (AOR 0.63; 95% CI 0.54-0.76), mothers' education (AOR 0.47; 95% CI 0.38-0.57) and husband's education level (AOR 0.85; 95% CI 0.74-0.94) were associated with the use of early ANC. Factors such as birth order (AOR 1.79; 95% CI 1.67-2.30), the exposure to media(AOR 1.11; 95% CI 0.98-1.30), women's education (AOR 0.58; 95% CI 0.46-0.73), residence(AOR 0.8; 95% CI 0.69-1.01) and the birth interval(AOR 1.45; 95% 1.32-2.00) were associated with the four ANC. Women's education (AOR 0.59; 95% CI 0.40-0.70), and health insurance coverage (AOR 0.72; 95% CI 0.59-0.96) were associated with the receiving of PNC.
Conclusions: Health promotion targeting women's education, husbands' education and behavioural change communication in rural areas are vital for increasing their awareness about the importance of antenatal services.

Keywords: Antenatal care services, Postnatal care services, Utilization, Burundi

INTRODUCTION

The use of antenatal and postnatal care services is an essential element in the care of the mother during pregnancy, childbirth and postpartum period.

Despite proven interventions and commitment of the governments and partners that could prevent death or disability during pregnancy and childbirth, maternal mortality remains a major burden in many developing countries. The maternal mortality ratio in developing regions is 15 times higher than in the developed regions, where Africa has been challenged than other part of the world.[1,2] Specifically, sub Saharan African countries have the highest MMR in the world with an average of 500 maternal deaths per 100,000 live births, accounting for half of the world's total maternal deaths.[3]

Improving maternal and newborn health requires strengthening of existing interventions in ANC and

PNC.[3,4] Studies have shown that antenatal care may play an indirect role in reducing maternal mortality by encouraging women to deliver with assistance of skilled birth attendant.[5] WHO recommends that pregnant women in developing countries to get at least four ANC visits and to initiate early ANC follow up. The 1st ANC timing to be before 16 weeks of gestational age, 2nd visit between 24 and 28 weeks of gestation age. In addition, the 3rd visit is between 30 and 32 weeks gestational age and the 4th visit between 36 and 38 weeks of gestational age.

In Burundi, according to the Burundi DHS reports, the percentage of women with the 1st ANC visit by a health professional was only 47%. Moreover, 49% had 4 ANC visits and only 49% had received PNC care within 24 hours at birth.[6,7]

A study done in central Ethiopia found maternal age, parity, lack of time, education, marital status and women's economic status to be significant predictors of utilization of maternity care.[7] In Burundi, there is no study conducted either based on small sample or single out only one aspect or based on secondary data available in health facilities.

It is thus important to examine the extent to which women are making use of the services and answer why many women do not use the maternal care services in Burundi. Understanding the factors that affect the utilization of these important maternal health services is paramount. In addition, it is the fundamental platform of designing strategies and developing policies toward improvement of maternal service utilization in the health facilities. Hence, the impetus of decreasing maternal mortality in Burundi.

The objective of this research was to identify factors that affect the utilization of ANC and PNC services utilization in Burundi.

METHODS

Study design, period and setting

The population-based cross-sectional study design was conducted in Burundi from October 2016 to January 2017. Burundi is located in the east of Africa and has 18 provinces. Participants were selected based on a stratified two-stage cluster sampling technique. The full details of methods and procedures used in data collection in the EDHS have been published elsewhere.[6]

Data source

This study used secondary data from the third Burundian DHS done in 2016-2017. The survey data was downloaded from measure DHS website after data use permission was guaranteed. The third DHS is part of the worldwide measure DHS project, which was funded by the United States agency for international development (USAID) and was implemented the institute of statistics and economics studies in Burundi. The survey includes all eighteen provinces of Burundi.

Sample size

A national representative sample of 17,269 households was selected for the study. From these households, a total of 16,620 women in the reproductive age group were interviewed using a structured questionnaire.[6] For this study, women who had at least one birth in the last five years preceding the survey were included in the analysis.

Study variables

Responses (outcomes) variables of this study and their definitions are use of the first ANC within 16 weeks (early attendance off ANC) of pregnancy which can be recorded as binary (1=yes and 0=no); use of a minimum of 4 ANC services during pregnancy which can be recorded as binary (1=yes and 0= no); use of PNC services within 24 hours at birth which can be recorded as binary (1=yes and 0=no).

Explanatory variables

We used Andersen's behavioral model of health services to determine the association between individual-level socioeconomic and demographic factors and the utilization of a specific package of maternal health services such as ANC and PNC.[8,9] According to Andersen's behavioral model, healthcare utilization is a function of three major elements, predisposing factors (age, education level attainment, region of residence, type of place of residence, religion, marital status and number of children ever born), enabling factors (e.g. income and health insurance).[10,11]

Data analysis procedures

Analysis was done using SPSS version 20.0. Frequencies were first determined followed by cross tabulations to compare frequencies. Bivariate and multivariate analysis techniques were used during analysis. Variables that show a statistically significant association at bivariate level were further analyzed at multivariate level by logistic regression. We assessed the contribution of each factor to the overall variance while controlling for all other included factors, we conducted a multivariate logistic regression analysis and we remained the final multivariate model.

RESULTS

The characteristics of women included in the present analysis and the factors associated with receiving ANC in the first 12 weeks (Table 1). In terms of socio-demographic factors, the results showed no statistically significant effect of mother's age at childbirth with receiving ANC in the first 12 weeks (p=0.180).

Women with high birth interval (4 years and above) were more likely to receive ANC services in the first 12 weeks compared with women with shorter birth interval (4 and above years 52.1%, 2-3years 43.4%, <2 years 41.5%; p<0.001). Women with the 1st birth order were more likely to attend ANC (1st birth order 59.1 %, 2nd birth order 48.0%, 3rd and above 37.9%; p=0.001).

Mothers from urban areas were more likely to receive ANC services in the first 12 weeks compared with mothers from rural areas (urban 60.1%, rural 44.8%; p=0.001). Women residing in Bujumbura mairie region were more likely to receive ANC services in the 12 weeks pregnancy than west region, north region, east central and south region (67.7%, 53.8%, 49.9%, 47.3%, 37,4% respectively; p=0.001).

The probability of attending ANC services in the first 12 weeks as recommended by WHO, increased significantly for mothers with high educational attainment (secondary education and above 61.5%, primary 47.9%, no education 42.4%; p=0.001) and for households with a higher wealth index (richest household 57.6%, poorest household 46.1%; p=0.001). There were no statistically significant effect of marital status with receiving ANC services in the first 12 weeks of pregnancy (p=0.662).

Women with others religions were more likely to receive ANC services compared with women with catholic, protestant and no religion with respectively 53.4%, 48.1%, 45.2% and 36.6%; p=0.001.

The probability of attending ANC services in the first 12 weeks pregnancy increased significantly for women who have exposure to the media (exposure to media 49.9%, no exposure to media 46.4%; p=0.003). Women without problem for health care accessibility were more likely to receive ANC services in the first 12 weeks of pregnancy than those who with healthcare accessibility problems (not a problem 52.8%, problem 45.2%; p=0.001). Women who were deciding together in the couple for their health were more likely to receive ANC services in the first 12 weeks of pregnancy than those who did not deciding together in the couple (decision takes together 50.8%, decision doesn't take together 44.8%; p=0.001). Mothers whose partners with low educational attainment were more likely not to attend ANC services in the first 12 weeks of pregnancy (no educated 45.5%, primary 45%, secondary and above 62%; p=0.001).

Table 2 provides factors associated with ANC use up to 4 visits. In terms of sociodemographic factors, the results showed statistically significant effect of the birth interval. The probability of receiving ANTC up to 4 visits increased among women with the high birth interval (4 years and above 51.2%, less than 2 years 43.9%; p=0.001). Women with low birth rank infants were more likely to receive ANC up to 4 visits as recommended by WHO (low birth 56.6%) than women having high birth rank infants (43.5% p<0.001). The results showed no statistically significant effect of area of residence on attending up to four ANC visits (p=0.05).

Women with high education level were more likely to attend ANC services up to four visits than women low level of education (secondary and above 55.2%, primary 51.2%, no education 46.1%; p<0.001). The probability of attending ANC up to 4 visits also increased as the wealth index increased (richest 53.3%, poorest 47.6%; p=0.001). The results showed no statistically significant effect of the religion on attending ANC services up to four visits during pregnancy.

Women having exposure to media were more likely to attend ANC up to four visits than women who did not have exposure to media (exposure to media 53.2%, not exposure to media 48.2%, p<0.001).

Women having problem in the accessibility to health care (48.7%) were more likely not to attend ANC up to four visits than women who did not have problem in the health care accessibility (51.4%, p=0.02).

The probability of attending ANC up to four visits increased significantly among women who had partner with high level of education (secondary and above 55.2%, no education 46.1%, p=0.000). The probability of attending ANC up to four visits increased significantly among women with health insurance coverage (yes 52.2%, no 48.6%; p=0.003).

Table 3 presents factors associated with postnatal care received within 24 hours at birth. The probability of receiving PNC within 24 hours at birth increased among women who had partner with qualified work than women who had partner without work (qualified worker 62.7%, none 53.6%, p=0.000). The results showed also the statistically significant effect of health insurance coverage. The probability of receiving PNC within 24 hours at birth increased significantly among women who had health insurance coverage (yes 62.6%, no 51.7%; p=0.000). The probability of receiving PNC services within 24 hours also increased as the wealth index increased (richest 66.8%, poorest 49.7%; p=0.000). Women residing in urban areas were more likely to receive PNC services within 24 hours at birth than women residing in rural areas (urban 68.8%, rural 51.3%; p<0.001).

Women who received ANC done by qualified personnel (nurse, doctor) were more likely to receive PNC services within 24 hours at birth than women who did not received PNC (yes 54.8%, no 38.9%; p=0.030).

The probability of having PNC services within 24hours at birth increased as the education level of the women

increased (secondary and above 67.8%; no education 50.0%; p<0.0001).

Women residing in Bujumbura mairie region were likely to have PNC services within 24 hours at birth than women residing in others region (Bujumbura mairie 80.5%, east central 56.7%, north 52.6%, west 52.9%, south 50.5%; p<0.001).

The attending ANC services in the first 12 weeks of pregnancy were associated with a number of factors (Table 4). For the birth order, women with the first born and second born are 1.64 and 1.74 times more likely to attend ANC consultations in the 12 first weeks of pregnancy compared to the reference group (women with 3rd born and more).

Table 1: Characteristics of women aged 15-49 years who had one birth during the 5 years preceding the survey and factors associated with antenatal care use in the first 12 weeks (n=8660).

Independent variables	Women received the early ANC (in the first 12 weeks)		
	Yes (%)	No (%)	Frequency
Age at childbirth (in years)			
<20	46.5	53.5	3487
20-34	48	52	5078
35 or above	57.1	42.9	35
Chi2 (p<0.05)	3.38 (0.18)		
Birth interval			
<2 years	41.5	58.5	1073
2-3 years	43.4	56.6	43
4 years and above	52.1	47.9	1554
Chi2 (p<0.05)	41.318 (p<0.001)		
Birth order			
1	59.1	40.9	1469
2	48	52	5023
3 and above	37.9	62.1	2108
Chi2 (p<0.05)	157.499 (p<0.001)		
Area of residence			
Urban	60.1	39.9	1481
Rural	44.8	55.2	7119
Chi2 (p<0.05)	115.081 (p<0.001)		
Region			
North	49.9	50.1	2668
Centre east	47.3	52.7	2482
West	53.8	46.2	993
South	37.4	62.6	2058
Bujumbura mairie	67.7	32.6	399
Chi2 (p<0.05)	170.551 (p<0.001)		
Education level			
None	42.4	57.6	3774
Primary	47.9	52.1	3610
Secondary and above	61.5	38.5	1216
Chi2 (p<0.05)	135.041 (p<0.001)		
Wealth index quintiles			
Poorest	46.1	53.9	1 805
Second	46.2	53.8	1 727
Middle	43.8	56.2	1 648
Fourth	42.1	57.9	1 572
Richest	57.6	42.4	1 848
Chi2 (p<0.05)	105.924 (p<0.001)		
Marital status			
No married	45.2	54.8	361
In union	47.6	52.4	7590
Divorced	47.1	52.9	649
Chi2 (p value)	0.825 (0.662)		

Continued.

Independent variables	Women received the early ANC (in the first 12 weeks)		
	Yes (%)	No (%)	Frequency
Religion			
Catholic	48.1	51.9	4855
Protestant	45.2	54.8	2907
Others	53.4	46.6	721
None	36.6	63.2	117
Chi2 (p<0.05)	22.178 (p<0.001)		
Exposure to media			
No	46.4	53.6	6015
Yes	49.9	20.1	2585
Chi2 (p<0.05)	9.066 (p<0.003)		
Accessibility to health care			
Not a problem	52.8	47.2	2539
Problem	45.2	54.8	6061
Chi2 (p<0.05)	41.301 (p<0.001)		
Decision making within the couple			
Decision doesn't take together	44.8	55.2	4152
Decision takes together	50.8	49.2	3410
Chi2 (p<0.05)	27.021 (p<0.001)		
Husbands education			
None	45	55	2774
Primary	45.4	54.6	3754
Secondary and above	62	38	1051
Chi2 (p<0.05)	102.600 (p<0.001)		

Table 2: Characteristics of women aged 15-49 years who had one birth during the 5 years preceding the survey and factors associated with antenatal care use up to 4 visits (n=8660).

Independent variables	Women who had 4 ANC visits		
	Yes (%)	No (%)	Frequency
Birth interval			
<2 years	43.9	56.1	1079
2-3 years	48.1	51.9	4399
4 years and above	51.2	48.8	1564
Chi2 (p<0.05)	13.347 (p<0.001)		
Birth order			
1	56.6	43.4	1485
2	49.9	50.1	5049
3 and above	43.5	56.5	2126
Chi2 (p<0.05)	61.196 (p<0.001)		
Area of residence			
Urban	51.8	48.2	1487
Rural	49.1	50.9	7173
Chi2 (p<0.05)	3.654 (p<0.05)		
Region			
North	48.1	51.9	2691
Centre east	55.9	44.1	2499
West	44.5	55.5	998
South	45.5	54.5	2072
Bujumbura Mairie	53	47	400
Chi2 (p<0.05)	67.996 (p<0.001)		
Education level			
None	46.1	53.9	3807
Primary	51.2	48.8	3632
Secondary and above	55.2	44.8	1221

Continued.

Independent variables	Women who had 4 ANC visits		
	Yes (%)	No (%)	Frequency
Chi2 (p<0.05)	38.15 (p=0.001)		
Wealth index quintiles			
Poorest	47.6	52.4	1 828
Second	49.5	50.5	1 738
Middle	49.8	50.2	1 655
Fourth	47	53	1 580
Richest	53.3	46.7	1 859
Chi2 (p<0.05)	17.142 (p<0.002)		
Religion			
Catholic	50.6	49.4	4886
Protestant	47.8	52.2	2929
others	50.9	49.1	725
None	42.5	57.5	120
Chi2 (p<0.05)	8.613 (p<0.055)		
Exposure to media			
No	48.4	51.6	6065
Yes	52.2	47.8	2595
Chi2 (p<0.05)	10.72 (p<0.001)		
Accessibility to health care			
Not a problem	51.4	48.6	2551
Problem	48.7	51.3	6109
Chi2 (p<0.05)	5.246 (p<0.02)		
Decision making within the couple			
Decision doesn't take together	51.2	48.8	4165
Decision takes together	50.4	49.6	3428
Chi2 (p<0.05)	0.499 (p<0.48)		
Husbands education level			
None	46.1	53.9	3807
Primary	51.2	48.8	3632
Secondary and above	55.2	44.8	1221
Chi2 (p<0.05)	31.35 (p<0.001)		
Health insurance coverage			
Yes	52.2	47.8	2241
No	48.6	51.4	6419
Chi2 (p<0.05)	8.7 (p<0.003)		

Table 3: Characteristics of women aged 15-49 years who had one birth during the 5 years preceding the survey and factors associated with postnatal care received within 24 hours at birth (n=7246).

Independent variables	Women who had received postnatal care within 24 hours at birth		
	Yes (%)	No (%)	Frequency
Type of occupation of partner			
Qualified worker	62.7	37.3	804
Agriculture worker	52.4	47.6	5073
Other	65.7	34.3	274
None	53.6	46.4	234
Chi2 (p<0.05)	44.893 (p<0.001)		
Health insurance coverage			
No	51.7	48.3	5271
Yes	62.6	37.4	1975
Chi2 (p<0.05)	68.849 (p<0.001)		
Wealth index quintiles			
Poorest	49.7	50.3	1406
Second	50.5	49.5	1403

Continued.

Independent variables	Women who had received postnatal care within 24 hours at birth		
	Yes (%)	No (%)	Frequency
Middle	51.0	49.0	1366
Fourth	52.4	47.6	1320
Richest	66.8	33.2	1751
Chi2 (p<0.05)	139.576 (p<0.001)		
Area of residence			
Urban	68.8	31.2	1404
Rural	51.3	48.7	5842
Chi2 (p<0.05)	139.671 (p<0.001)		
Antenatal care done with qualified health worker (nurse, doctor)			
Yes	54.8	45.2	7210
No	38.9	61.1	36
Chi2 (p<0.05)	3.653 (p<0.030)		
Birth assistance by qualified health worker			
Yes	54.8	45.2	7223
No	39.1	60.9	23
Chi2 (p<0.05)	2.259 (p<0.133)		
Age at childbirth (in years)			
<20	54.4	45.6	2899
20-34	54.8	45.2	4315
35 years and above	65.8	34.4	32
Chi2 (p<0.05)	1.646 (p<0.463)		
Level of education			
None	50.0	50.0	3002
Primary	54.4	45.6	3091
Secondary and above	67.8	32.2	1153
Chi2 (p<0.05)	107.379 (p<0.001)		
Region			
North	52.6	47.4	2282
Eastern centre	56.5	43.5	2032
West	52.9	47.1	851
South	50.5	49.5	1701
Bujumbura Mairie	80.5	19.5	380
Chi2 (p<0.05)	122.134 (p<0.001)		
Husband's education			
None	51.0	49.0	2200
Primary	53.1	46.9	3206
Secondary and above	66.0	34.0	991
Chi2 (p<0.05)	66.167 (p<0.001)		
Religion			
Catholic	55.0	45.0	4068
Protestant	53.1	53.1	2449
Others	59.8	59.8	652
None	46.8	46.8	77
Chi2 (p<0.05)	11.443 (p<0.14)		
Birth interval			
<2	55.5	44.5	893
2-3	52.3	47.7	3569
4years and above	56.6	43.4	1306
Chi2 (p<0.05)	10.857 (p<0.001)		

Table 4: Logistic regression analysis for variables associated with receiving antenatal care in the first 12 weeks in Burundi; 2016-2017.

Independent variables	Final model				
	Frequency	Odds ratio	95% CI Lower	Upper	P value
Birth order					
1	1073	1.64	1.51	1.73	<0.001
2	4373	1.74	1.62	1.91	<0.001
3	1554	1			
Level of education					
None	3384	0.47	0.38	0.57	<0.001
Primary	2900	0.54	0.45	0.65	<0.001
Secondary and above	716	1			
Place of delivery					
Home	1204	0.64	0.54	0.76	<0.001
Institutional	5776	1			
Region					
North	2158	0.84	0.75	0.94	<0.001
Estern centre	2005	0.76	0.67	0.85	<0.001
West	833	0.65	0.57	0.76	<0.001
South	1717	0.57	0.47	0.66	<0.001
Bujumbura Mairie	287	1			
Husbands education					
None	2498	0.85	0.74	0.94	<0.001
Primary	3166	0.89	0.78	1.01	<0.001
Secondary and above	758	1			

Table 5: Logistic regression analysis for variables associated with receiving antenatal care up 4 visits in Burundi; 2016-2017.

Independent variables	Final model				
	Frequency	Odds ratio	95% CI for OR Lower	Upper	P value
Birth order					
1	1485	1.79	1.67	2.30	<0.002
2	5049	1.82	1.71	2.08	<0.001
3 and above	2126	1			
Exposure to media					
No	6065	1.11	0.98	1.30	<0.45
Yes	2595	1			
Education level					
None	3807	0.58	0.46	0.73	<0.001
Primary	3632	0.9	0.72	1.12	<0.09
Secondary and above	1221	1			
Area of residence					
Urban	1007	1			
Rural	5444	0.8	0.69	1.01	<0.002
Birth interval (in years)					
<2	1079	1.45	1.32	2.00	<0.001
2 -3	4399	1.2	0.9	1.36	<0.001
4	1564	1			

Table 6: Logistic regression analysis for variables associated with receiving postnatal care within 24 hour at birth in Burundi; 2016-2017 (n=7243).

Independent variables	Final model				
	Frequency	Odds ratio	95% CI Lower	Upper	P value
Decision making within couple					
Do not decide together	3427	0.85	0.75	1.11	<0.004
Decide together	2955	1			
Education level					
None	3002	0.59	0.40	0.70	<0.001
Primary	3091	0.64	0.52	0.81	<0.001
Secondary and above	1153	1			
Region					
North	2282	0.39	0.25	0.51	<0.001
Estern centre	2032	0.43	0.37	0.59	<0.001
West	851	0.41	0.32	0.56	<0.001
South	1701	0.34	0.27	0.48	<0.001
Bujumbura Mairie	380	1			
Area of residence					
Urban	1404	1.32	1.19	1.52	<0.002
Rural	5842	1			
Health insurance coverage					
Yes	1975	1			
No	5271	0.72	0.59	0.96	<0.009

Continued.

Women with no education attainment and primary education level were 53 and 46 percent less likely to attend ANC consultations in the 12 weeks of pregnancy compared to the women with high level of education. Women who gave delivery at home were 36 percent less likely to attend ANC consultations than women who gave delivery at institutional. Level of education of partner was also strongly associated with attending ANC consultations in the first 12 weeks of pregnancy. Therefore, women who had illiterate partners were 15 percent less likely to attend ANC consultations.

In the final model for multivariate analysis testing the association between ANC attending up to 4 visits during pregnancy as recommended by WHO (Table 5). The attendance of ANC up to 4 visits was associated with several factors. Women with the first born and second born were 1.79 and 1.82 times more likely to attend ANC consultations up to 4 visits of pregnancy compared to the reference group (women with 3rd born and more). The education level was associated with ANC attendance up to 4 visits. Women residing in rural area were 20 percent less likely to attend ANC consultations up to 4 visits compared to women residing in urban area (reference category). Birth interval was associated with attending ANC consultations up to 4 visits. Low birth interval was associated with attending ANC consultations up to 4 visits, suggesting that low birth interval mothers are 1.45 times more likely to attend ANC consultations up to 4 visits compared to the reference category.

The receiving postnatal care within 24 hours was associated with some factors in the final multivariate model (Table 6). Women who did not decide together with partner for her health were 25 percent less likely to receive PNC within 24 hours at birth compared to reference category.

Women with low level of education were 41% less likely to receive PNC within 24 hours at birth compared to women with high level of education. In addition, women residing in urban area were 32% or 1.32 times more likely to receive PNC within 24 hours at birth compared to women residing in rural area. Moreover, women without health insurance card were 28% less likely to receive PNC within 24 hours at birth compared to women who had covered with health insurance (reference category).

DISCUSSION

The present study aimed to examine the key factors predicting the utilization behavior among women receiving maternal care such as ANC during the first 12 weeks, ANC up to 4 visits and PNC within 24 hours at birth in Burundi.

Overall findings showed that low education attainment of mothers was associated with decreased ANC. Several pathways have been suggested through which maternal education might affect health-care use. However, highly educated women were more likely to be aware about the importance of health services and more able to select the

most appropriate service for their needs.[12,13] Certain reasons may explain why that literate women were more prone to using both ANC services and PNC. Education is likely to enhance female autonomy and help most women to develop greater confidence and capability to make decisions about their own health. Furthermore, an increased odds of antenatal care services was observed in mothers of high birth rank infants.[14,15]

The association between high parity and low use of maternal health services observed in our study has been reported in previous studies.[16] Additionally, it was found that women with high parity tend to rely on their experience from previous pregnancies and do not feel the need for antenatal checks, believing they already know what to expect during pregnancy and childbirth.

Our study also found that area of residence (urban or rural) and region was associated with ANC use. This may be explained by the inaccessibility of services because in rural areas primary health centers provide ANC are not equipped for delivery services.

Similar studies from other countries reported an advantage for women living in urban areas over women in rural areas to ANC use, attributed to different service and social environments.[17,18] In addition, a qualitative study from Indonesia showed that in rural areas, a long travel time worsened by poor road conditions prevented communities from attending antenatal services.[19]

This study has found that education of women and husbands have had a significant effect on the use of ANC services in the first 12 weeks of pregnancy. This positive relationship may explain by the fact that educated husband are more knowledgeable. They have the willingness to discuss the advantages of antenatal consultation. Hence, the good communication contribute positively to improve the ANC of their wives. Other studies have found a similar result.[18,20]

Finally, a decreased likelihood to postnatal care receiving within 24 hours along with the women who were not covered with health insurance was also found in our study.

Women without health insurance were less likely to be able to afford health services, and their associated costs. Although, Burundi population health insurance scheme was provided to the entire population to promote an increase and a free access to health services in health facilities, but health insurance mechanism covered only 17. 19% of the population according to the Burundi DHS done in 2010. This might be due to the lack of understanding and how health insurance scheme could be used by some community members specifically in rural area. Urgent attention to implement effective communication programs to support appropriate use of the insurance scheme is necessary.

Strengths and limitations

Our study was based on large representative national survey, the third Burundi DHS in 2016-2017. The potential of recall bias has been minimized by restricting the sample only to mother's most recent delivery within the last five years of survey. The large sample used in this study allows the examination of various potential explanatory variables and it increased the validity of the study results.

The major limitation of this study relates to the secondary nature of the data that were used. Therefore, invariably many events captured through a retrospective inquiry are often susceptible to recall bias and memory lapse. Despite that, the selection of potential risk factors was driven by the availability of information in the DHS. However, these limitations are unlikely to impact on the validity of the analyses.

CONCLUSION

Receiving services and care increased consistently as the education level of women and their husbands increase. There is a high inequality of the attendance of antenatal consultations between urban and rural areas.

Therefore, we suggest the strategic promotion of ideal ANC and PNC utilization. There is need to formulate policies and design programs, which target women and husbands with low education. Self-actualization model targeting pregnant women and their husbands in order to develop ability to control their own health status within their own environment is needed. Women and their husbands must be encouraged to engage in critical thinking and critical action at individual level. Health insurance should cover all women regardless their filed of activities either formal or informal. Any future studies must therefore address aspects of health systems and the quality of care in Burundi.

The primordial and pyramidal health promotional strategies for reproductive age women between 15-49 is critically needed and has to be emphasized from the early age of puberty to envision the high quality of their future reproductive health.

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