

# Predictors of Modern Contraceptive Use Among Married Women in Angola: A Population Based Study

**Betregiorgis Hailu Zegeye** (✉ [betregiorgiszegeye27@gmail.com](mailto:betregiorgiszegeye27@gmail.com))

HaSET Maternal and Child Health Research Program

**Gashaw Woldeamanuel Garedew**

Wolkite University

**Wassie Negash**

Debre Berhan University

**Balkew Tegegn Asegidew**

Debre Berhan Health Science College

---

## Research

**Keywords:** Modern contraceptive, predictors, Angola, DHS, global health

**Posted Date:** August 7th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-53360/v1>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

---

# Abstract

**Background:** Maternal mortality is unacceptably high in Sub-Saharan-African countries including Angola. Despite family planning is one of the vital intervention to reduce maternal death, the coverage of modern contraceptive use in Angola is extremely low and there is a paucity of evidence regarding current factors associated with contraceptive use in Angola. Therefore, this study aimed at investigating predictors of contraceptive use among married women in Angola using nationally representative data.

**Methods:** The data were extracted from 2015/16 Angola Multiple Indicator and Health Survey for this study and approximately 8,033 married women aged 15 - 49 years were participated. Bivariate and multivariate logistic regression were performed using STATA version 14 software to identify the predictors, and p-value less than 0.05 was considered as statistically significant.

**Results:** The coverage of modern contraceptive use among married women was 8.9%. Maternal age, women's educational level, maternal occupation, place of residence, media exposure, number of living children, desire for more children and subnational region were main predictors for modern contraceptive use.

**Conclusion:** Modern contraceptive use among married women in Angola was very low. Married women who were educated, wealthiest, exposed for media, who had living children, interested to have child after 2 years and those who were not interested to have at all were more likely to use contraceptive. Therefore, the government of Angola and other concerned bodies need to emphasize in empowering women through education and economy as well as dissemination of contraceptive related information through media especially for women's living in rural settings.

## Background

Family planning (FP) is one of the vital intervention for reducing maternal and infant mortality, enhancing economic development through increased women's participation in the labor force, and more sustainable use of resources due to reduced population growth (1–4). Contraceptive has multidimensional benefits for individuals and couples such as health, economic and social aspect as a result of planning in the numbers of children they want, when and how many children they want to have (5, 6).

Numerous scholars showed that 30–90% of induced abortion related maternal deaths are reduced (1), ensure physical and emotional health of women, decrease maternal, child and newborn mortality (7–9), and are critical in accelerating progress towards attainment of the Sustainable Development Goals (SDGs) (9). The global community has committed, over the next 15 years, to work towards access to sexual and reproductive health, including family planning, and the realization of reproductive rights for all people (10, 11). The 2030 Agenda for Sustainable Development include relevant targets for family planning under the broader goals of health and well-being of the population (Goal 3) and gender equality and the empowerment of women and girls (Goal 5)(10, 11).

Worldwide, in 2017, 63% of married or partnered women of reproductive age were using some form of contraception, including any modern or traditional methods of contraception (12, 13). On the other hand, contraceptive use was much lower in Africa (36%) compared to other regions in the world, where contraceptive use ranged from 58% in Oceania to around 75% in Northern America, Latin America and the Caribbean in 2017 (12, 13).

The changes in Africa have been slow, where contraceptive prevalence increased from 8% in 1970 to 25% in 2000 and reached 36% in 2017; considerable gaps persist in the use of modern methods among couples who want to prevent pregnancy. Large gaps remain in the proportion of demand for family planning satisfied by use of modern methods in countries where overall contraceptive use is low or where many couples rely on traditional methods of contraception (12, 13). In low- and middle-income countries (LMICs), contraceptive use differs broadly from country to country due to numerous socio-economic factors. For instance, modern contraceptive prevalence varied from below 10% in Chad, Guinea and South Sudan to 67% in Zimbabwe and 71% in the Democratic People's Republic of Korea in the year 2017 (12, 13).

Prior studies in Angola showed maternal age, maternal educational status, prior information and knowledge about contraceptive use, discussion with partner, marital status, and accessibility to supply were the main factors for contraceptive use (14–16). According to 2015/2016 Angola Multiple Indicator and Health Survey, married women in urban areas are more likely to use modern methods of family planning (18%) than married women in rural areas (only 2%) (17). Provincially, Cuando Cubango has the lowest use of modern methods by married women (1%), and Luanda has the highest (30%). Use of modern methods increases dramatically with economic status(17). Only 1% of married women from the poorest households use modern methods, compared with 31% of married women from the wealthiest households (17).

Few studies have been conducted in Angola related to contraceptive use (14–16). However, these studies were focused on a single factor (15) and limited to some areas of the country (14, 15). Moreover, the available studies might not indicate the current situations of modern contraceptive use. Hence, this study aimed at investigating predictors of modern contraceptive use among married women in Angola using the recent 2015/16 nationally representative data.

## **Methods**

### **Data source**

The data used for this study were from 2015/16 Multiple Indicator and Health Survey, which was conducted by Angola National Institute of Statistics (INE) in direct collaboration with Ministry of Health (MINSa) and Ministry of Planning and Territorial Development (MPDT) with technical assistance from United Nations Children's Fund (UNICEF) and ICF (17). It is a nationally representative survey designed to provide current information with regard to the demographic and health situation of women, men, and

children including fertility levels, marriage, sexual activity, fertility preferences, family planning methods, childhood and maternal mortality, maternal and child health, breastfeeding practices, nutrition, malaria, HIV/AIDS, domestic violence, and child wellbeing (17). For sample selection, a two stage cluster sampling technique was employed involving the systematic selection of clusters at national level in the first stage, and then final selection of households from those clusters were conducted in the second stage for the survey (17). The 2015-16 IIMS survey included a sample of 14,379 women aged 15–49 years and 5,684 men aged 15–54 years. The sample design for the 2015-16 IIMS provides estimates at the national and provincial levels, and for urban and rural areas (17). We used the Individual Recode (IR) file and the analysis for this study restricted for married women.

## Variable selection

The main outcome variable of this study was modern contraceptive methods. Married women who have used pills, injectables, implants, intra-uterine devices (IUDs), condoms, sterilization, diaphragms, spermicides, and sponges were categorized and coded as modern contraceptive method users (18), whereas non-users and a very few (less than 1%) traditional users were coded as non-users. Explanatory variables were categorized based on prior evidence (8, 19–26). These include women's age, women's educational level, and women's occupation, place of residence, regions, religion, and husband educational level. Fertility and reproductive health specific variables included number of living children, ideal number of children, desire for more children, and distance to health and exposure to media was assessed in terms of frequency.

Moreover, variables like wealth index, attitude towards wife beating and decision making (as women's empowerment) were included. The DHS wealth index is a composite measure of household's cumulative living standard Wealth index, which is derived from household assets and features was used to approximate economic status. Principal Component Analysis (PCA) is used to compute wealth index in DHS and classifies it as poorest, poorer, middle, richer, and richest (25). The DHS asks respondents about their decision-making power regarding several dimension: making decisions regarding own health care, large household purchases and visits to family or relatives. In this study, if the decision on all three dimensions was made by husband/partner alone or by other (i.e. mother in law), it was coded as no decision making; if respondent had decision-making power alone or with her husband/partner over one or two of the decision-making parameters, it was coded as moderate decision making; if the respondent had decision-making power either alone or with her husband on three of the decision-making parameters, it was coded as higher decision making. Women were asked if they agree that a husband is justified in beating his wife for the following reasons: (i) burning food, (ii) arguing with him, (iii) going out without telling him, (iv) neglecting the children and (v) refusing to have sexual intercourse with him. If the woman disagreed to all of these reasons, they were assumed to be empowered. Therefore, an overall binary variable was created to reflect attitude towards wife beating. Attitude towards wife beating was coded as 'no' if respondent did not agree with wife beating, and 'yes' if she accepted wife beating as normal/healthy behaviour.

## Statistical analysis

Descriptive statistics and multivariate analysis were performed in this study. First, percentages (%) were used to show the distributional characteristics of all the variables. Second, we conducted bivariate logistic regression to select candidate variable for multivariate analysis using p-value less than 0.05 as cut of point. Then, we applied multivariate logistic regressions to examine the relationship between each explanatory variable and modern contraceptive utilization. Crude and adjusted Odd ratios with 95% confidence intervals (CI) were estimated. .

The complex sampling structure of the DHS requires specific weighting to adjust for disproportionate sampling and nonresponse. Thus, the 'svyset' command was used to weight the data, accounting to the sample cluster and strata (27). All statistical analyses were performed In STATA 14 (Stata Corp, College Station, Texas, USA).

## **Ethical consideration**

From publicly available DHS data set, data analysis were performed. Because the ethical clearance was approved by the institution that commissioned, funded and managed the overall DHS program, further ethical clearance was not required. Informed consent from the participants prior to survey was ensured. The ICF international and respective country's ethical review Board (IRB) also ensured that the protocols are in compliance with the U.S. Department of Health and Human Services regulations for the protection of human subjects.

## **Results**

In this study a total of 8,033 married women were involved. Of them, about 686 (8.5%) and 1,650 (20.5%) of the participants were in the age group of 15–19 and 20–24 years, respectively. Nearly two sixth (33.2%) of the respondents had no formal education, while about 3,039 (37.8%) attended primary school, and more than one forth (26.2%) of the respondents attended secondary school. Similarly, one forth (25.7%) of their husband had no formal education. More than two fifth (42.1%) of the participants were rural residents and about 2,753 (34.3%) of the respondents had no exposure for newspapers, radio or television for at least once a week. Nearly half (49.7%) of the participants ideally wanted to have six children and more than half of the participants (51%) reported distance to facility is a big problem. Regarding decision making, while 561 (7%) of the women had no decision making power on all of the decision making parameters, her own health, purchasing household expense and visiting family or relatives, about 2,370 (29.5%) of the women decided either alone or together with their husband on the two of the three above mentioned decision making parameters (Table 1).

Table 1  
 Participants' socio-demographic characteristics:  
 Evidence from 2015/2016 Angola Multiple Indicator and  
 Health Survey

<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
<b>Women's age</b>		
15–19	686	8.54
20–24	1,650	20.54
25–29	1,734	21.59
30–34	1,341	16.69
35–39	1,138	14.17
40–44	891	11.09
45–49	593	7.38
<b>Women's educational level</b>		
No formal education	2,667	33.20
Primary school	3,039	37.83
Secondary school	2,106	26.22
Higher	221	2.75
<b>Husband's educational level</b>		
No formal education	2,068	25.74
Primary school	2,102	26.17
Secondary school	3,362	41.85
Higher	501	6.24
<b>Place of residence</b>		
Urban	4,649	57.87
Rural	3,384	42.13
<b>Religion</b>		
Catholic	3,229	40.20
Methodist	305	3.80
Assembly of god	662	8.24
Universal	86	1.07

<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
Jehovah's witness	155	1.93
Protestant	3,043	37.88
No religion	445	5.54
Other	108	1.34
<b>Media exposure</b>		
No	2,753	34.27
Yes	5,280	65.73
<b>Economic status</b>		
Poorest	1,657	20.63
Poor	2,113	26.30
Middle	1,964	24.45
Richer	1,278	15.91
Richest	1,021	12.71
<b>Number of living children</b>		
No child (ref)	405	5.04
1-2 children	2,545	31.68
3-4 children	2,573	32.03
5 and above children	2,510	31.25
<b>Ideal number of children</b>		
No child	246	3.06
1 child	86	1.07
2 children	402	5.00
3 children	394	4.90
4 children	2,039	25.38
5 children	873	10.87
6 children and above	3,993	49.71
<b>Desire for more children</b>		
Wants within 2 years	1,343	17.69

<b>Variables</b>	<b>Frequency</b>	<b>Percent</b>
Wants after 2 years	2,000	26.34
Wants, unsure timing	755	9.94
Undecided	1,221	16.08
Wants no more	2,275	29.96
<b>Distance to health facility</b>		
Big problem (ref)	4,102	51.06
Not a big problem	3,931	48.94
<b>Women empowerment</b>		
Not empowered	561	6.98
Moderately empowered	2,370	29.50
Highly empowered	5,102	63.51
<b>Wife-beating attitude</b>		
Accepted	2,527	31.46
Refused	5,506	68.54

## Predictors of modern contraceptive use

This study showed that about 91.1% of the married women were not used modern contraceptive methods (Fig. 1).

The results of the adjusted OR and 95% CI for the relationship between demographic, socioeconomic, woman-and husband/partner factors and modern contraceptive use are shown in Table 2.

We found women's age had significant association with utilization of modern contraceptive methods. For instance, the odd of married women within 45–49 years age groups were 92% (AOR = 0.08, 95% CI; 0.03–0.25) less likely to use modern contraceptive as compared to married women within 15–19 years age group.

Educational level of women were another predictor of modern contraceptive use. In fact, the present study showed the utilization of modern contraceptive among married women who attended secondary school were 2.5 times (AOR = 2.53, 95% CI; 1.28–5.01) higher as compared to married women who had no formal education. Similarly, the utilization among married women who attended above secondary school were approximately 3 times (AOR = 2.99, 95% CI; 1.27–7.07) higher as compared to married women who had no formal education.

Maternal occupation had significant association with utilization of modern contraceptive. We found, the odd of modern contraceptive use among married women worked as agricultural self-employed were lower by 51% (AOR = 0.49, 95% CI; 0.30–0.79) as compared to married women who were not working. However, the odd of modern contraceptive use among married women whose occupation were in household and domestic are 3.4 times (AOR = 3.41, 95% CI; 1.04–11.16) higher as compared to married women who were not working.

Husband educational level was another predictor of modern contraceptive use among married women. For instance, the odd of modern contraceptive utilization among married women whose husband attended above secondary school level were 2.8 times (AOR = 2.83, 95% CI; 1.54–5.21) higher as compared to married women whose husband had no formal education.

Place of residence were also significantly associated with use of modern contraceptive. For instance, compared to married women living in urban setting, the odd of modern contraceptive utilization among married women living in rural setting were lower by 52% (AOR = 0.48, 95% CI; 0.32–0.73).

We found media exposure had significant association with utilization of modern contraceptive methods. In fact, in our study the utilization of modern contraceptive methods among married women who had media exposure for at least less than a week, be it for newspapers, radio or television were 76% (AOR = 1.76, 95% CI; 1.01–3.08) higher as compared to married women who had no media exposure.

We observed more utilization of modern contraceptive methods among married women who had many living children. For example, in our study the odd of modern contraceptive utilization among married women who had 1–2 and 3–4 living children were 5.8 times (AOR = 5.85, 95% CI; 1.53–22.31) and 6 times (AOR = 6.04, 95% CI; 1.61–22.63) higher as compared to married women who had no child. Similarly, the odd of contraceptive utilization among married women who had five and above living children were approximately 8 times (AOR = 7.97, 95% CI; 1.97–32.19) higher as compared to married women who had no child.

Desire for more children was another predictor of modern contraceptive use. For instance, in our study, compared to married women who wanted to have children within two years, the odd of modern contraceptive utilization among married women wanted to have children after two years were 84% (AOR = 1.82, 95% CI; 1.24–2.68) higher.

Another predictor identified in the present study for modern contraceptive use were subnational region. The odd of modern contraceptive utilization use among married women living in Cuando Cubango, Lunda Norte and Lunda Sul regions were lower by 80% (AOR = 0.20, 95% CI; 0.08–0.53), 77% (AOR = 0.23, 95% CI; 0.11–0.46) and 59% (AOR = 0.41, 95% CI; 0.19–0.89) as compared to our reference-Cabinda region respectively (Table 2).

Table 2  
Predictors of modern contraceptive use among married women in Angola: Evidence from  
2015-16 Angola Multiple Indicator and Health Survey

Variables	COR (95% CI)	AOR (95% CI)
<b>Women's age</b>		
15–19 (ref)		
20–24	1.84 (1.18–2.87) **	1.09 (0.68–1.76)
25–29	2.49 (1.60–3.87) ***	1.20 (0.67–2.17)
30–34	2.14 (1.30–3.52) ***	0.98 (0.51–1.88)
35–39	1.67 (1.00–2.79) *	0.90 (0.45–1.79)
40–44	1.33 (0.76–2.34)	0.75 (0.32–1.75)
45–49	0.31 (0.14–0.71) **	0.08 (0.03–0.25)***
<b>Women's educational level</b>		
No formal education (ref)		
Primary school	3.29 (2.15–5.04) ***	1.40 (0.84–2.34)
Secondary school	14.10 (8.34–23.82) ***	2.53 (1.28–5.01)**
Higher	24.11 (12.71–45.74) ***	2.99 (1.27–7.07)*
<b>Occupation</b>		
Not Working (ref)		
Professional/Technical/Managerial	2.13 (1.45–3.15) ***	1.22 (0.75–1.96)
Clerical	4.37 (1.24–15.29) *	1.70 (0.42–6.86)
Sales	0.87 (0.65–1.16)	0.98 (0.69–1.41)
Agricultural - Self Employed	0.08 (0.04–0.13) ***	0.49 (0.30–0.79)**
Household and Domestic	3.28 (1.09–9.83) *	3.41 (1.04–11.16)*
Services	1.55 (1.15–2.10) **	1.24 (0.84–1.81)
Skilled Manual	0.66 (0.31–1.41)	0.68 (0.29–1.61)
Unskilled Manual	0.69 (0.32–1.49)	0.76 (0.31–1.83)
Other	2.35 (0.33–16.41)	2.09 (0.50–8.73)
<b>Husband's educational level</b>		

Notes: \*p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, ref: reference

<b>Variables</b>	<b>COR (95% CI)</b>	<b>AOR (95% CI)</b>
No formal education (ref)		
Primary school	0.93 (0.58–1.48)	0.84 (0.50–1.43)
Secondary school	5.41 (3.48–8.42) ***	1.66 (1.00-2.74)*
Higher	15.59 (9.35–25.99) ***	2.83 (1.54–5.21)**
<b>Place of residence</b>		
Urban (ref)		
Rural	0.08 (0.05–0.13) ***	0.48 (0.32–0.73)**
<b>Religion</b>		
Catholic (ref)		
Methodist	1.27 (0.70–2.27)	0.87 (0.42–1.82)
Assembly of god	2.04 (1.36–3.06) **	1.31 (0.78–2.20)
Universal	3.41 (1.95–5.94) ***	1.38 (0.76–2.51)
Jehovah's witness	3.70 (2.32–5.91) ***	1.62 (0.99–2.65)
Protestant	0.99 (0.77–1.26)	1.11 (0.86–1.44)
No religion	0.59 (0.28–1.23)	1.25 (0.57–2.73)
Other	0.26 (0.05–1.20)	0.37 (0.09–1.52)
<b>Media exposure</b>		
No (ref)		
Yes	10.10 (6.36–16.03) ***	1.76 (1.01–3.08)*
<b>Economic status</b>		
Poorest (ref)		
Poor	2.56 (1.39–4.71) **	1.52 (0.76–3.03)
Middle	9.34 (4.58–19.04) ***	1.35 (0.59–3.05)
Richer	21.63 (10.86–43.08) ***	1.76 (0.76–4.04)
Richest	42.23 (21.44–83.16) ***	2.41 (1.00-5.79)*
<b>Number of living children</b>		
No child (ref)		

Notes: \*p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, ref: reference

<b>Variables</b>	<b>COR (95% CI)</b>	<b>AOR (95% CI)</b>
1–2 children	7.71 (2.08–28.56) **	5.85 (1.53–22.31)*
3–4 children	5.86 (1.58–21.68) **	6.04 (1.61–22.63)**
5 and above children	3.75 (0.96–14.65)	7.97 (1.97–32.19)**
<b>Ideal number of children</b>		
No child (ref)		
1 child	1.54 (0.49–4.83)	0.47 (0.12–1.84)
2 children	2.28 (0.95–5.46)	0.70 (0.28–1.76)
3 children	3.40 (1.48–7.76) **	0.99 (0.37–2.63)
4 children	2.80 (1.33–5.89) **	0.84 (0.36–1.93)
5 children	1.20 (0.52–2.77)	0.57 (0.23–1.44)
6 children and above	0.81 (0.38–1.75)	0.63 (0.26–1.52)
<b>Desire for more children</b>		
Wants within 2 years (ref)		
Wants after 2 years	2.31 (1.65–3.24)***	1.82 (1.24–2.68)**
Wants, unsure timing	1.46 (0.95–2.24)	1.28 (0.80–2.06)
Undecided	0.85 (0.51–1.39)	1.06 (0.60–1.88)
Wants no more	1.69 (1.15–2.48)**	2.01 (1.29–3.13)**
<b>Distance to health facility</b>		
Big problem (ref)		
Not a big problem	1.61 (1.26–2.06) ***	0.97 (0.74–1.27)
<b>Women empowerment</b>		
Not empowered (ref)		
Moderately empowered	2.19 (1.22–3.94) **	1.24 (0.62–2.47)
Highly empowered	2.55 (1.45–4.49) **	1.18 (0.61–2.24)
<b>Wife-beating attitude</b>		
Accepted (ref)		
Refused	2.10 (1.61–2.76) ***	1.00 (0.73–1.37)

Notes: \*p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, ref: reference

Variables	COR (95% CI)	AOR (95% CI)
<b>Region</b>		
Cabinda (ref)		
Zaire	0.51 (0.29–0.86) *	0.78 (0.45–1.36)
Uige	0.24 (0.15–0.37) ***	0.92 (0.57–1.49)
Luanda	1.63 (1.11–2.40) *	1.19 (0.76–1.87)
Cuanza Norte	0.28 (0.13–0.59) **	0.54 (0.22–1.34)
Cuanza Sul	0.26 (0.11–0.59) **	1.11 (0.47–2.60)
Malanje	0.57 (0.32–1.02)	1.11 (0.61–2.02)
Lunda Norte	0.11 (0.05–0.22) ***	0.23 (0.11–0.46)***
Benguela	0.71 (0.44–1.15)	1.16 (0.63–2.14)
Huambo	0.31 (0.17–0.54) ***	0.72 (0.44–1.19)
Bie	0.11 (0.04–0.30) ***	0.50 (0.18–1.34)
Moxico	0.21 (0.09–0.47) ***	0.60 (0.24–1.46)
Quando Cubango	0.07 (0.02–0.23) ***	0.20 (0.08–0.53)**
Namibe	1.19 (0.76–1.86)	1.52 (0.94–2.46)
Huila	0.48 (0.28–0.83) **	1.38 (0.81–2.36)
Cunene	0.49 (0.26–0.90) *	1.38 (0.69–2.76)
Lunda Sul	0.23 (0.10–0.51) ***	0.41 (0.19–0.89)*
Bengo	0.19 (0.08–0.48) ***	0.40 (0.15–1.07)
Notes: *p < 0.05, ** p < 0.01, *** p < 0.001, ref: reference		

## Discussion

Contraception is one of the key components for family planning and vital means to reduce mortality and morbidity of both child and mother (1–3, 8, 28). In this study, using the recent 2015/2016 Angola Multiple Indicator and Health Survey, several personal and community level predictors for utilization of modern contraceptive methods among married women were analyzed. We found that women's age, women's and husband educational level, place of residence, women's occupation, economic status, media exposure, number of alive children, desire to have more children, and subnational region were the main determinants for utilization of modern contraceptive methods.

In line with previous literature (19, 21, 24, 25, 28), our findings also revealed that women were less likely to use modern contraceptives with increasing age when controlling for other factors. Modern contraceptive use among women 45–49 years of age was lower than adolescent women (women within 15–19 years of age). Higher uptake of contraceptive use among young women may be due to the influence of communication among young women and their husbands/partners about family planning, as seen in a 2016 study in Angola (29).

We found women's educational level influenced uptake of modern contraceptive use as supported by previous studies (30–32). It highlights, especial attention should be given for married women with less educational level or not have formal education at service provision area such as during counseling and need to taking account during awareness creation such as using audio-visual aid instead of leaflets distribution.

Modern contraceptive also varied based on their occupation types. Compared to married women who were not working, women with agriculturally self-employed were less likely to use. However, those worked in household and domestic were more utilize modern contraceptive methods.

In our study, we found that utilization of modern contraceptives varied based on husband educational level. In fact, married women whose husband attended primary school and higher level were more likely to use contraception as compared to women whose husband did not attend formal education. Similar findings in previous studies (26, 33), suggest husband's educational level increased the uptake of contraceptive use for family planning because of increased communication between the couple, that lead to increased support of contraceptive use by the husband, which also influenced his actions through is adoption of condom use and/or sterilization (34, 35).

Having exposure for media significantly increased the uptake of modern contraceptive methods. In our study, married women who either read the newspaper, listened to radio or watched television for at least once a week were more likely to utilize modern contraceptive methods than women with no media exposure. Previous studies in Senegal and West Bengal (36, 37), showed similar findings. Mass media is a key strategy for increasing demand for use in health services (38). It is a process that helps communities to identify their own needs and to respond to and address these needs (38). Gaining the participation of community members can help providers raise awareness both of health issues at the community level and of social and cultural issues that may promote or inhibit use of information and services, as well as improve clients' understanding of the methods or services being offered (39). Specific barriers to service access and use can be addressed and service utilization increased (39). Community mobilization encourages concern of the needs of specific populations and localities. In particular, underserved populations, such as youth and men, can be reached more effectively through community mobilization (39).

Consistent with previous studies (18, 40, 41), the number of living children had significant association with the use of modern contraceptive methods. Compared to married women with no child, the likelihood of utilization was higher among women with children. A possible explanation might be related to certain

myths that prohibit women from seeking family planning, such as the belief that contraceptive use is associated with women who are “promiscuous” (42). Cultural and traditional beliefs hold strong in many rural areas in Africa, holding on to beliefs that influence lack of change (i.e. use of modern contraception) (43). Another justification for less use of modern contraceptive among women with no child especially if it is due to death of child, it could be due to higher desire to have more children as means of filling the gap brought on by the loss of that particular child (44).

The other main finding of the study was, the influence of women’s desire to have more children on the utilization of contraceptive methods. Women wanted to have children after two years were more utilized than women who desired to have children in a shorter period. Additionally, those women who undecided when to have children and those who had no more desire or sterilized (themselves/their husband) better utilized the modern contraceptive methods as compared to women who wanted to have more children in less than two years. Our finding is in line with previous study (45). Evidence suggested that desire for more children might be related to religion (43). A study with similar results found that in Kenya and Tanzania, Muslim women desire more children than Christians (43, 46). Additionally, It might be related to educational level of the women and overall perception towards family size (43). A study in Ethiopia showed, women with an educational attainment less than grade one were found to have a larger ideal number of children, compared to illiterate women as well as those who have attained grade one or higher (43). Another justification related to perception is, women who attach a “high-benefit” economic value to children have a larger reported ideal number of children (i.e., family size) than women who perceive children to be a high cost. Couples view their children as an investment and that these children are due for pay-up when their parents reach old-age (43). In African traditions, it is almost always predictable that once the child grows older, he/she will be indebted to financially pay back (i.e., support) the parent(s) for his/her (47) a high value to having children will aim for larger families who will later fit the role of being a provider and caregiver to the parents in old age (43).

Women living in urban setting were more likely to utilize modern contraception than their counterparts in rural regions as documented in previous studies (47, 48). This could be related to knowledge about contraceptive methods; which is highly related with its uptake (27, 49, 50) and rural residents had relatively lower level of knowledge than urban residents (47). Furthermore, uptake of contraception is strongly related with education (34), and formal education remains low among women and men in rural areas (47).

We found difference in utilization of modern contraceptive across regions as suggested in previous studies (25, 33, 51). The disparities might be due to existed social norm and culture (45, 52) and difference in accessibility of health facility and quality of the services given in the facilities across regions (33).

This study has its own strength and limitations. Using the recent and nationally representative data can help to understand the current nationwide predictors of modern contraceptive use, believed to be the main strength of the study. However, the study has the following limitations. Since the data is cross-sectional it

does not measure causality between explanatory factors and the outcome variable-modern contraceptive use. The authors are only able to use the variables available in the secondary dataset for analysis and other variables such as cultural and perception factors as well as quality of care were not included.

## **Conclusions**

Numerous personal and community level predictors such as women's educational level, women's occupation, place of residence, media exposure, economic status, number of living children, desire for more children and region were identified in this study.

Strategies to increase family planning should consider changing societal myths and community cultural perceptions while also engaging key community leaders. It is also important to reach the women living in deprived regions (i.e. rural) where access to health facilities and resources are low. Mass media would be an approach to upsurge awareness, education and community mobilization regarding utilization of modern contraceptive methods. Empowering women through education and economy could be the possible policy implication.

## **Abbreviations**

AOR: Adjusted Odd Ratio

FP: Family Planning

CI: Confidence Interval

COR: Crude Odd Ratio

DHS: Demographic and Health Survey

ICF: Inner City Fund

IRB: Institutional Review Board

IR: Individual Recode

SDG: Sustainable Development Goal

WHO: World Health Organization

## **Declarations**

### **Ethics approval and consent to participate**

Ethics approval was not required since the data is available to the public domain.

## Consent for publication

Not applicable

## Availability of data and materials

The datasets generated and/or analyzed during the current study are available in <http://dhsprogram.com/data/available-datasets.cfm>.

## Competing interests

The authors declare no competing interests.

## Funding

No funding was received for this work.

## Authors' contribution

BZ and GGW contributed to the conception and design of the study, interpreted the data, prepared the manuscript, and led the paper, WN and BA helped with data analysis, provided technical support in interpretation of results and critically reviewed the manuscript. All authors read and revised drafts of the paper and approved the final version.

## Acknowledgment

We acknowledge the Demographic and Health Surveys Program for making the DHS data available, and we thank the women who participated in the surveys.

## References

1. Cleland J, Bernstein S, Alex E, Faundes A, Glasier A, Innis J. "Family planning: The unfinished agenda." *The Lancet*. 2006; 368 (9549):1810-1827.
2. Gribbl JN, J.Bremner J. "Achieving a demographic dividend." *Population Bulletin* 67 (2). 2012.
3. Graff M, Bremner J. *A practical guide to population and development* Washington: Population Reference Bureau. 2014.
4. Canning D, Schultz TP. The economic consequences of reproductive health and family planning. *Lancet*. 2012;380 (9837):165-71.

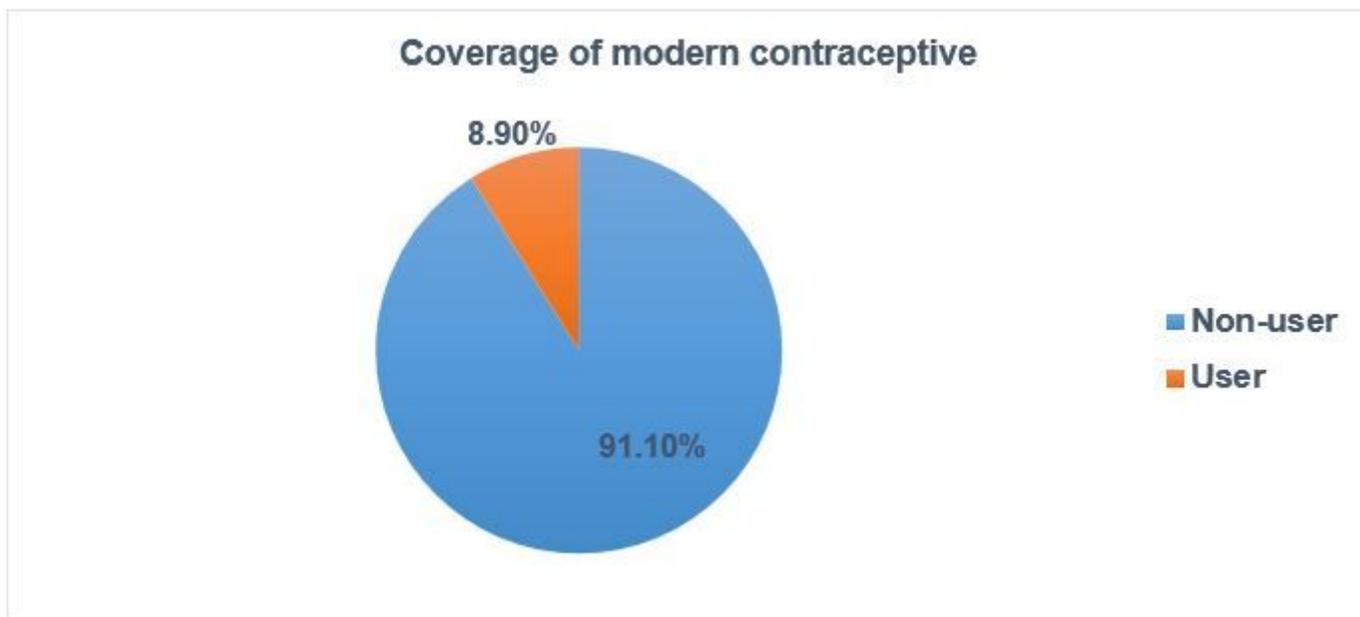
5. United Nations, Department of Economic and Social Affairs, Population Division (2017). World Family Planning. 2017 - Highlights (ST/ESA/SER.A/414). 2017. 7. WHO. Family Planning/Contraception. 2018. [Available from: <http://www.who.int/mediacentre/factsheets/fs351/en/>] 2018. [Cited 27 May 2020].
6. WHO. 2018. Family Planning/Contraception. Available at <http://www.who.int/mediacentre/factsheets/fs351/en/>. Accessed on 8 April 2020.
7. Ahmed SQ, Liu LL, Tsui AO. "Maternal deaths averted by contraceptive use: An analysis of 172 countries." *The Lancet*. 2012; 380 (9837):111-125.
8. Ajmal S, Idris A, Ajmal B. Factors Affecting Contraceptive Use and Unmet Need among Currently Married Women in Afghanistan: Further Analysis of the 2015 Afghanistan Demographic and Health Survey. DHS Working Paper 138. Rockville, Maryland, USA: ICF. 2018.
9. Starbird E, Norton M, Marcus R. Investing in family planning: key to achieving the sustainable development goals. *Glob Health Sci Pract*. 2016;4 (2):191-210.
10. United Nations General Assembly. Transforming our world: the 2030 Agenda for Sustainable Development. General Assembly Resolution 70/1. 2015. [Available from [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/70/1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E)] accessed on July 20, 2020]
11. United Nations (2017a). The Sustainable Development Goals Report 2017. New York: United Nations. Available from <https://unstats.un.org/sdgs/files/report/2017/TheSustainableDevelopmentGoalsReport2017.pdf>. Accessed on JULY 20, 2020].
12. United Nations, Department of Economic and Social Affairs, Population Division (2017b). Model-based Estimates and Projections of Family Planning Indicators 2017. New York: United Nations. 2017.
13. United Nations, Department of Economic and Social Affairs, Population Division (2017). World Family Planning 2017 - Highlights (ST/ESA/SER.A/414). 2017.
14. Prata N, Bell S, Weidert K, Nieto-Andrade B, Carvahlo A, Neves I. Varying family planning strategies across age categories: differences in factors associated with current modern contraceptive use among youth and adult women in Luanda, Angola. *Journal of Contraception*. 2016; 7:1-9.
15. Nieto-Andrade B, Fidel E, Simmons R, Sievers D, Fedorova A, Bell S. Women's Limited Choice and Availability of Modern Contraceptive at Retail outlets and Public-Sector Facilities in Luanda, Angola, 2012-2015. *Global Health: Science and Practice*; 2017 5(1)75-89.
16. Dekker M, Constantine NA. Factor associated with contraceptive use in Angola. *Afr J Reprod Health*. 2011; 15 (4):68-77.
17. Instituto Nacional de Estatística (INE), Ministério da Saúde (MINSÁ), Ministério da Planeamento e do Desenvolvimento Territorial (MPDT) and ICF. Key Findings of the 2015-16 Angola IIMS. Luanda, Angola. Rockville, Maryland, U.S.A.: INE, MINSÁ, MPDT and ICF. 2017.

18. Bradley SEK, Croft TN, Fishel JD, Westoff CF. Revising Unmet Need for Family Planning. DHS Analytical Studies No. 25 [available at <https://dhsprogram.com/pubs/pdf/AS25/AS25%5B12June2012%5D.pdf>]. accessed on July 28, 2020].
19. Goni A, Rahman M. The impact of education and media on contraceptive use in Bangladesh: A multivariate analysis. *Int. J. Nurs. Pract.* 2012; 18 (6), 565-73. <https://doi.org/10.1111/ijn.12013> PMID:23181958.
20. Elfstrom KM, Stephenson R. The role of place in shaping contraceptive use among women in Africa. *PloS ONE.* 2012; 7(7).
21. Endriyas M, Eshete A, Mekonnen E, Misganaw T, Shiferaw M, Ayele S. Contraceptive utilization and associated factors among women of reproductive age group in Southern Nations Nationalities and Peoples' Region, Ethiopia: cross-sectional survey, mixed-methods. *Contraception and Reproductive Medicine* (2017) 2:10.
22. Ajong AB, Njotang PN, Yakum MN, Essi MJ, Essiben F, Eko FE, et al. Determinants of Unmet Need for Family Planning among Women in Urban Cameroon: A Cross Sectional Survey in the Biyem-Assi Health District, Yaounde. *BMC Womens Health.* 2016;16:4.
23. Cleland JG, Ndugwa RP, Zulu EM. "Family planning in Sub-saharan Africa: Progress or stagnation?" *Bulletin of the World Health Organization.* 2011; 89:137-143.
24. Hailu TG. Determinants and Cross-Regional Variations of Contraceptive Prevalence Rate in Ethiopia: A Multilevel Modeling Approach. *Am J Math Stat.* 2015;5(3):95-110.
25. Kibria GMA, Hossen S, Barsha RAA, Sharmeen A, Paul SK & Uddin SMI. Factors affecting contraceptive use among married women of reproductive age in Bangladesh. *Journal of Molecular Studies and Medicine Research.* 2016; 02(01):70-79.
26. Yaya S, Uthman OA, Ekholuenetale M, Ghose Bishwajit G. Women empowerment as an enabling factor of contraceptive use in sub-Saharan Africa: a multilevel analysis of cross-sectional surveys of 32 countries. *Reproductive Health.* 2018; 15:214 <https://doi.org/10.1186/s12978-018-0658-5>.
27. Belayneh F, Abreha S, Meskele M. Knowledge, attitude and factors associated with the use of long acting and permanent contraceptive methods among women of reproductive age in Gesuba Town, Southern Ethiopia. *J Biol Agric Healthcare.* 2015;5(21):14.
28. Abdurahman M, Desalegn W, Amsalu F, Megabiaw B. Determinants of Modern Contraceptive Utilization among Married Women of Reproductive Age Group in North Shoa Zone, Amhara Region, Ethiopia. *Reprod Health.* 2014;11 (13).
29. Britannica. Republic of Senegal. [Available from <https://www.britannica.com/place/senegal>]. Accessed on 02 May 2020].
30. Sileo KM, Wanyenze RK, Lule H, Kiene SM. Determinants of family planning service uptake and use of contraceptives among postpartum women in rural Uganda. *Int J Public Health.* 2015; 60 (8):987-97. .

31. Do M, Hotchkiss D. Relationships between antenatal and postnatal care and post-partum modern contraceptive use: evidence from population surveys in Kenya and Zambia. *BMC Health Serv Res.* 2013; 13:6.
32. Wuni C, Turpin CA, Dassah ET. Determinants of contraceptive use and future contraceptive intentions of women attending child welfare clinics in urban Ghana. *BMC Public Health.* 2018; 18:79 DOI 10.1186/s12889-017-4641-9.
33. Cronin CJ, Guilkey DK, Speizer IS. The effect of health facility access and quality on family planning decisions in urban Senegal. *Health Economic.* 2017; 27(3).
34. Hossain M, Ahmed S & Rogers L. Does a wife's education influence spousal agreement on approval of family planning? Random effects Modeling using data from two West African Countries. *J Health Care Poor Underserved.* 2014; 25:562-576, doi: 10.1353/hpu.2014.0098.
35. Gubhaju B. The influence of wives' and husbands' education levels on contraceptive method choice in Nepal, 1996-2006. *Int Perspect Sex Reprod Health.* 2009; 35(4):176-85.
36. Okigbo CC, Ilene S, Speizer SS, Corroon M, Gueye A. Exposure to family planning messages and modern contraceptive use among men in urban Kenya, Nigeria, and Senegal: a cross-sectional study. *Reproductive Health.* 2015; 12:63.
37. Haque I, Patel PP "Socioeconomic and Cultural Differentials of Contraceptive Usage in West Bengal: Evidence from National Family Health Survey Data." *Journal of Family History.* 2015; 40(2):230-49. [available at <https://doi.org/10.1177/0363199015572753>. accessed on 10 Apr 2020].
38. Richard ML, Paul K, Anne-Marie N. Influence of mass media on family planning methods use among couples in Gashenyi Sector Rwanda *International Journal of Multidisciplinary Research and Development.* 2017; 4(6): 336-343.
39. Howard-Grabman L, Snetro G. How to mobilize communities for health and social change. Baltimore, MD: Health Communication Partnership 2003. [Available at <http://www.jhuccp.org/hcp/pubs/tools/HowtoMobilize/index.html>]. Accessed on 11 April 2020].
40. Oso L. Press and politics in Nigeria: on whose side? LASU Inaugural Lecture Series, 47th edition. Ojo, Lagos: Lagos State University Random House Unabridged Dictionary (2005). Maternity. New York: Random House. 2012.
41. Ogunjuyigbe PO, & Adepoju A. Perspectives on socio-cultural context of adolescent reproductive health behaviour in Nigeria. *African Population Studies,* 2014; 27(2):343-351. <https://doi.org/10.11564/272-479>.
42. Prata N, Bell S, Weidert K, Nieto-Andrade B, Carvalho A, Neves I. Varying family planning strategies across age categories: differences in factors associated with current modern contraceptive use among youth and adult women in Luanda, Angola. *Open Access Journal of Contraception.* 2016; 7.
43. Susuman AS, Bado A, Lailulo YA. Promoting family planning use after childbirth and desire to limit childbearing in Ethiopia. *Reproductive Health* 2014, 11:53.
44. Odesanya A, Hassan S, Olaluwoye D. Mass Media and Maternal Healthcare: A Critical Discourse. *New Media and Mass Communication* 2015; 34.

45. Frost JJ, Darroch JE. Factors associated with contraceptive choice and inconsistent method use, United States, 2004. *Perspect Sex Reprod Health*.2008; 40(2):94-104.
46. Muhoza D, Ndaruhuye, Broekhuis A, Hooimeijer P: Variations in Desired Family Size and Excess Fertility in East Africa. *International Journal Population Research*. 2014:1-11. [Available at: <<http://dx.doi.org/10.1155/2014/486079>>2014/486079 <<http://dx.doi.org/10.1155/2014/486079>>. Accessed on 11 April 2020].
47. Cavallaro FL, Benova L, Macleod D, Faye A, Lynch CA .Examining trends in family planning among harder-to-reach women in Senegal 1992-2014. *Sci Rep*. 2017; 7:41006.
48. Solanke BL. "Socio-demographic Factors Associated with Unmet Need for Family Planning among Women Who Experienced Pregnancy Termination in Nigeria." *African Journal for the Psychological Study of Social Issues*. 2016; 19(3):112-25.
49. Birhan T, Degu G, Birhanu Z. Assessment of modern contraceptive practice and associated factors among currently married women age 15-49 years in Farta District, South Gondar Zone, North West Ethiopia. *Sci J Public Health*. 2014;2(6):507-12.
50. Earsido A, Gebeyehu A, Kisi T. Determinants of long acting and permanent contraceptive methods utilization among married women in Hossana Town, Southern Ethiopia: a case-control study. *J Pregnancy Child Health*. 2015;2(3):1000165.
51. Kamal SM. Socioeconomic factors associated with contraceptive use and method choice in urban slums of Bangladesh. *Asia Pac. J. Public Health*. 2015; 27(2): 2661-76. <https://doi.org/>.
52. Pennachio DL. Caring for your Muslim patients .stereo types and misunderstandings affect the care of patients from the Middle East and other parts of the Islamic world. *Med Econ*. 2005; 82(9):46.

## Figures



## Figure 1

Coverage of modern contraceptive use among married women in Angola: Evidence from 2015/2016  
Angola Multiple Indicator and Health Survey