Prevalence and predictors of contraceptive use among women of reproductive age in 17 sub-Saharan African countries: A large population-based study

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ABSTRACT

Objective: To measure the prevalence of contraceptive use among women of reproductive age in 17 sub-Saharan Africa countries and identify factors associated with contraceptive use in these countries.
Study design: We conducted a population-based cross-sectional study using data on contraceptive use from the Demographic and Health Surveys (DHS) for 17 sub-Saharan Africa countries (Angola, Benin, Burkina Faso, Burundi, Cameroon, Congo, Gambia, Ghana, Guinea, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Togo, and Uganda). We restricted our sample to women aged 15–49 years and used generalized estimating equations to identify factors associated with contraceptive use while controlling for other covariates.
Results: The overall prevalence of current contraceptive use among women of reproductive age was only 17%, with rates ranging from 7% in Gambia to 29% in Uganda. After adjusting for potential confounders, we found that women were more likely to use a method of contraception if they were sexually active (adjusted prevalence ratio (aPR) 2.17 [95% confidence interval (CI) 2.11, 2.24]); had 5–7 living children (aPR 2.19 [95% CI 1.89, 2.55] compared to no children); had secondary or higher education (aPR 1.71 [95% CI 1.63, 1.78] compared to no education); and were wealthy (aPR 1.34 [95% CI 1.29, 1.40] compared to poor).
Conclusion: The use of contraceptives is low in sub-Saharan Africa, but varies substantially across countries. Use of contraception is associated with both personal and socioeconomic factors.

Introduction

Prior to 1980, access to modern contraceptives was very limited in sub-Saharan Africa (SSA), in part because African government officials expressed little support for family planning programs [1]. Before 1980, postpartum abstinence was the only method of family planning utilized in many African countries [2]. In the early 1980s, the occurrence of major political and economic crises led many African governments and policymakers to reconsider their views regarding the impact of population growth on socioeconomic development. Thus, African leaders started endorsing the family planning methods and the necessity to incorporate them into maternal and child health programs at national levels [1,3]. As a result, postpartum abstinence declined in African countries and women began shifting to modern contraceptive methods as a more effective method of achieving desired birth spacing between children [2]. While the prevalence of contraceptive use in SSA has increased considerably since the 1980's, recent studies indicate that it is still substantially lower in SSA countries than in most other regions of the world [4].

It is clear that further efforts are needed to improve access to and uptake of modern contraceptives in SSA [4–6]. However, information about current contraceptive use in SSA countries is limited because previous studies of contraceptive use in this region focused on only a handful of countries [7,8], ever-married women[5], and women aged 15 to 19 years old [9]. Furthermore, studies conducted by Tsui et al. (2017) and Emina et al. (2014) provided an overview and trend in the use of modern contraception in SSA countries [4,10]. In addition, little research has investigated personal and sociodemographic factors associated with contraceptive use. Information concerning which SSA countries may be in most need of improved access to contraceptives, and which women might particularly benefit from such services, would be useful for planning purposes and efforts to improve the health and

well-being of families in SSA. In this paper we report the results of a large-scale study of contraceptive use in 17 SSA countries, using the most recent survey data from these countries. We measured the prevalence of contraceptive use among women aged 15 to 49 within and across these 17 countries and investigated factors associated with current use of contraceptives. The principal goal of this study was to provide information to inform program planning and health policy aimed at improving the long-term health status of women and families in SSA.

Methods

Data source

We used data from the Demographic and Health Surveys program (DHS) for 17 SSA countries that we had access (Angola, Benin, Burkina Faso, Burundi, Cameroon, Congo, Gambia, Ghana, Guinea, Ivory Coast, Liberia, Mali, Niger, Nigeria, Senegal, Togo, and Uganda) to conduct a population-based cross-sectional study of contraceptive use. Survey data included in our study ranged from 2011 to 2017 and each country contributed one year of information.

The DHS program collects, analyzes, and disseminates high-quality data through more than 300 surveys in over 90 developing countries around the world. DHS surveys are conducted using a multistage, stratified design to collect information on population health, contraceptive use, human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS), malaria, anemia and nutritional status in each country. The data are nationally representative and the information collected from each country helps government officials and partners to effectively design and implement future interventions. DHS projects are funded by the U.S. Agency for International Development (USAID) and are implemented by ICF International.

Ethical considerations

To access DHS data, a request for authorization to download survey dataset for each country of interest was made and granted. Procedures and questionnaires for standard DHS surveys were reviewed and approved by the ICF Institutional Review Board (IRB) and the IRBs of the host countries. Written and oral informed consent were obtained from the study participants before beginning each survey and/or conducting biomarker tests. Participants were not coerced into participation [11] and the data are Health Insurance Portability and Accountability Act (HIPAA) protected and de-identified. We accessed the data for this study from the online StatCompiler tool (www.statcompiler.com).

Study population

We pooled the sample of 17 SSA countries and limited our sample to women of reproductive age (15 to 49 years) who had complete data on contraceptive use.

Statistical analysis

The primary aim of this study was to investigate predictors of contraceptive use among women of reproductive age. Univariate analyses were conducted, using frequency distributions for categorical variables to describe the characteristics of the study population. We calculated the prevalence of contraceptive use among women for each studied category as the number of women who reported using contraception methods divided by the total number of women interviewed in that category. This definition was used in a previous study [12]. Analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC, USA) and graphical display of the map of Africa using R-3.4.3. The multivariable analysis included generalized estimating equations with exchangeable correlation structure. To specify the use of the robust

variance estimator for Poisson regression, the REPEATED statement was used [13]. Prevalence ratios and 95% confidence intervals (CIs) were obtained by exponentiation of each regression coefficient. Descriptive results are presented as prevalence rates and the multivariable Poisson regression results are presented as adjusted prevalence ratios (aPR) with 95% CI. Statistical tests were reported as significant if the 95% CIs did not include 1.

Outcome variable

The main outcome variable for this study was contraceptive use, a binary variable with 1 representing women using any method of contraception and 0 for those not using any method of contraception. The contraceptive methods included in this study were: oral pills, injectable, implants/Norplant, intrauterine contraceptive devices (IUDs), male condoms, sterilization), traditional (i.e. periodic abstinence, withdrawal, lactation amenorrhea, and abstinence)[12]), and other methods (diaphragm, female condom, foam or jelly, other modern method).

Predictors variables

The independent variables in this study included age, education, sexually active, number of living children, prior HIV testing, terminated pregnancy, having a prenatal nurse or doctor, television and radio, marital status, wealth index, employment status, place of residence (urban/rural), and literacy. Previous studies revealed that the aforementioned predictors affect women's contraceptive uptake in SSA [12,14–21].

Results

Descriptive analysis of the socio-demographic characteristics of the sample population

Totals vary due to missing data for some variables. A total of 252,962 women (15 to 49 years) were included in this study. More than a third of the study participants were 15–24 years (40%), widowed/divorced/separated (41%), never married (39%) and uneducated (42%). More than half were currently employed (63%), had a prenatal nurse/midwife (58%), resided in rural areas (61%) and had no literacy (53%). While 52% were sexually active, 60% had never been tested for HIV. Wealth index indicator was split mostly between poor (39%) and rich (41%). While a majority of the women had a radio (62%), most did not have a television (65%). Only a fourth of the women (28%) had no living children.

Prevalence of contraceptive use

The overall prevalence rate of contraceptive use in this study was 17% and ranged from a low of 7% in Gambia to a high of 29% in Uganda. Fourteen of the 17 countries we studied had prevalence rates higher than 10% (Table 1 and Fig. 1).

Contraceptive use was more common among women aged 25–34 years (21%), with higher socioeconomic status (23%), with at least a secondary education (24%), and married (18%) (Table 2). The prevalence rate of contraceptive use was higher among women who had a radio or television (18% and 22%, respectively) compared to those without such. Similarly, the prevalence rate of contraceptive use was higher among women living in urban areas (22%) and currently employed (19%). Women who ever had a terminated pregnancy had the highest prevalence rate of contraceptive use (22%). Furthermore, women who had any prenatal care from a nurse/midwife or doctor or who visited a healthcare facility in the last 12 months had high prevalence rates of contraceptive use (22%, 29%, and 22%, respectively). Contraceptive use was more common among women with literacy

Table 1
Sample size and Prevalence of contraceptive use, Multivariable adjusted Prevalence Ratio by country and survey year.

Countries	Survey Year	Sample size	Contraceptive use	Multivariable Adjusted analysis
		N	N (%)	(aPR) (95% CI)
Overall		252,962	42,726 (16.89)	
Mali	2012–2013	10,424 (4.12)	1104 (10.59)	0.63 (0.58–0.69)
Togo	2013–2014	9480 (3.75)	1827 (19.27)	0.92 (0.85–1.01)
Benin	2011–2012	16,599 (6.56)	2292 (13.81)	0.56 (0.51–0.62)
Congo	2013–2014	18,827 (7.44)	3174 (16.86)	0.71 (0.66–0.76)
Ghana	2014	9396 (3.71)	2082 (22.16)	0.89 (0.83–0.96)
Niger	2012	11,160 (4.41)	1523 (13.65)	0.87 (0.80–0.93)
Angola	2015–2016	14,379 (5.68)	1460 (10.15)	0.35 (0.31–0.38)
Gambia	2013	10,233 (4.05)	684 (6.68)	0.40 (0.36–0.45)
Guinea	2012	9142 (3.61)	771 (8.43)	0.44 (0.38–0.52)
Nigeria	2013	38,948 (15.40)	6225 (15.98)	0.52 (0.49–0.56)
Uganda	2015	18,506 (7.32)	5418 (29.28)	ref.
Burkina	2010	17,087 (6.75)	2681 (15.69)	0.92 (0.86–0.99)
Liberia	2013	9239 (3.65)	1872 (20.26)	0.90 (0.83–0.97)
Senegal	2017	16,787 (6.64)	3057 (18.21)	1.09 (1.03–1.16)
Burundi	2016–2017	17,269 (6.83)	3015 (17.46)	0.93 (0.87–0.99)
Cameroon	2011	15,426 (6.10)	3651 (23.67)	0.76 (0.71–0.82)
Ivory Coast	2011–2012	10,060 (3.98)	1890 (18.79)	0.80 (0.74–0.87)

(23%), who were sexually active (24%), and had a sexually transmitted infection (27%). Interestingly, the prevalence of contraceptive use decreased as the number of living children increased. Lastly, contraceptive use was more common among those who had prior HIV testing (26%).

Independent factors associated with contraceptive use among women

After adjusting for potential confounders, our results showed that the country of residence was the factor most strongly associated with contraceptive use (Table 2). With the exception of women living in

Senegal, all other countries in this study were less likely to use contraception methods compared to Uganda. Women who were sexually active were 2.17 times more likely to use contraceptives compared to those who are not. Similarly, having at least 1 living child was positively associated with contraceptive use: 1–4 children, 5–7 children, 8–10 children, and 11–14 children compared to those with no children. Women with primary and secondary or higher education were more likely to use contraceptives (aPR 1.41 [95% CI 1.36, 1.78], aPR 1.46 [95% CI 1.63, 1.78], respectively) compared to those without any education. Women who were never married and those divorced/widowed/separated were 37% and 23% more likely to use contraceptive
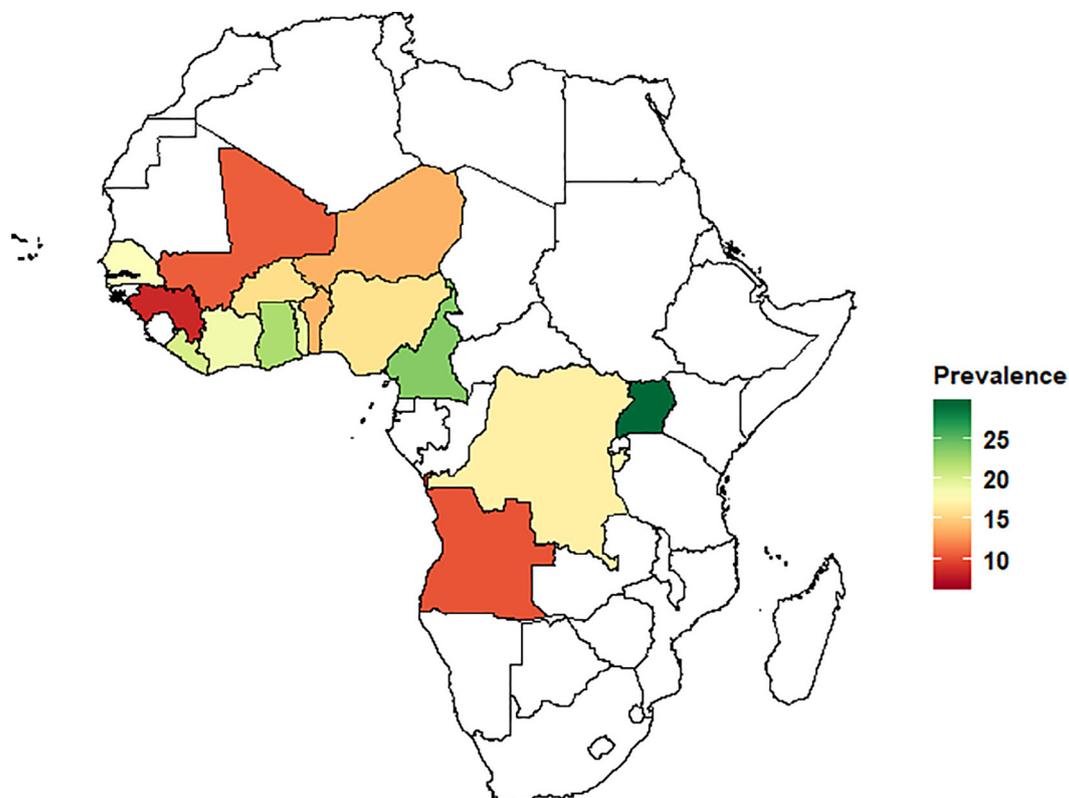

Fig. 1. Prevalence (%) of contraceptive use in women of reproductive age (15–49 years) shaded by sub-Saharan countries in Africa. Countries shaded white were not included in the analysis.

Table 2
Characteristics of the sample, Prevalence, Multivariable adjusted Prevalence Ratio (N = 252,962).

Characteristic	Sample size	Contraceptive use	Multivariable Adjusted analysis
	N (%)	N (%)	(aPR) (95% CI)
Age group			
15–24	100,022 (39.54)	13,247 (13.24)	ref.
25–34	81,052 (32.04)	16,576 (20.45)	1.08 (1.05–1.11)
35–49	71,888 (28.42)	12,903 (17.95)	1.11 (1.07–1.15)
Wealth Index status			
Poor	99,100 (39.18)	10,885 (10.98)	ref.
Middle	50,618 (20.01)	7901 (15.61)	1.19 (1.14–1.23)
Rich	103,244 (40.81)	23,940 (23.19)	1.34 (1.29–1.39)
Place of Residence			
Urban	98,269 (38.85)	21,646 (22.03)	ref.
Rural	154,693 (61.15)	21,080 (13.63)	1.14 (1.09–1.17)
Education			
No education	105,606 (41.75)	10,895 (10.32)	ref.
Primary	66,673 (26.36)	12,396 (18.59)	1.41 (1.36–1.46)
Secondary/Higher	80,651 (31.89)	19,430 (24.09)	1.71 (1.63–1.78)
Marital status			
Never married	64,518 (25.51)	8879 (13.76)	1.37 (1.31–1.44)
Married/Living with partner	171,238 (67.69)	31,099 (18.16)	ref.
Widowed/Divorced/Separated	17,205 (6.80)	2748 (15.97)	1.23 (1.18–2.30)
Employment status			
No	94,102 (32.31)	12,514 (13.30)	ref.
Yes	158,384 (62.73)	30,132 (19.02)	1.19 (1.16–1.22)
Sexually active			
No	119,663 (48.21)	11,701 (9.78)	ref.
Yes	128,534 (51.79)	30,673 (23.86)	2.17 (2.11–2.24)
STI			
No	239,294 (94.92)	39,180 (16.37)	ref.
Yes	12,799 (5.08)	3430 (26.80)	1.11 (1.06–1.15)
Ever been tested for HIV			
No	152,041 (60.39)	16,569 (10.90)	ref.
Yes	99,704 (39.61)	25,949 (26.03)	1.31 (1.28–1.36)
Number of living children			
None	69,900 (27.63)	7405 (10.59)	ref.
1 to 4	126,974 (50.19)	24,500 (19.30)	1.87 (1.61–2.16)
5 to 7	46,853 (18.52)	9252 (19.75)	2.19 (1.89–2.55)
8 to 10	8768 (3.47)	1492 (17.02)	2.07 (1.77–2.42)
11 to 14	467 (0.18)	77 (16.49)	1.86 (1.44–2.40)
Household has radio			
No	96,115 (38.01)	14,504 (15.09)	ref.
Yes	156,739 (61.99)	28,195 (17.99)	0.99 (0.96–1.00)
Household has TV			
No	164,220 (64.97)	22,957 (13.98)	ref.
Yes	88,535 (35.03)	19,751 (22.31)	1.13 (1.10–1.17)
Ever had terminated pregnancy			
No	218,509 (60.39)	35,306 (16.16)	ref.
Yes	34,339 (39.61)	7405 (21.56)	0.98 (0.96–1.00)
Prenatal nurse/midwife			
No	59,262 (42.48)	9628 (16.25)	ref.
Yes	80,238 (57.52)	17,932 (22.35)	1.21 (1.17–1.25)
Prenatal Doctor			
No	123,438 (88.49)	22,916 (18.56)	ref.
Yes	16,062 (11.51)	4644 (28.91)	1.19 (1.15–1.23)
Visited health facility last 12 mths			
No	134,131 (53.08)	16,716 (12.46)	ref.
Yes	118,581 (46.92)	26,005 (21.93)	1.23 (1.20–1.26)
Literacy			
No	133,586 (52.89)	15,550 (11.64)	ref.
Yes	118,964 (47.11)	27,112 (22.79)	1.13 (1.10–1.17)

than those who were married, respectively. Additionally, rich and middle wealth index women were more likely to use contraceptives compared to poor women (aPR 1.34 [95% CI 1.29, 1.40], aPR 1.19 [95% CI 1.14, 1.23], respectively). Women who visited healthcare facilities, had a prenatal nurse/midwife, or doctor were 23%, and 19% more likely to use contraceptives as those without, respectively. Having a television in the household and literacy were positively associated with the use of contraceptives (aPR 1.13 [95% CI 1.10, 1.17], aPR 1.13
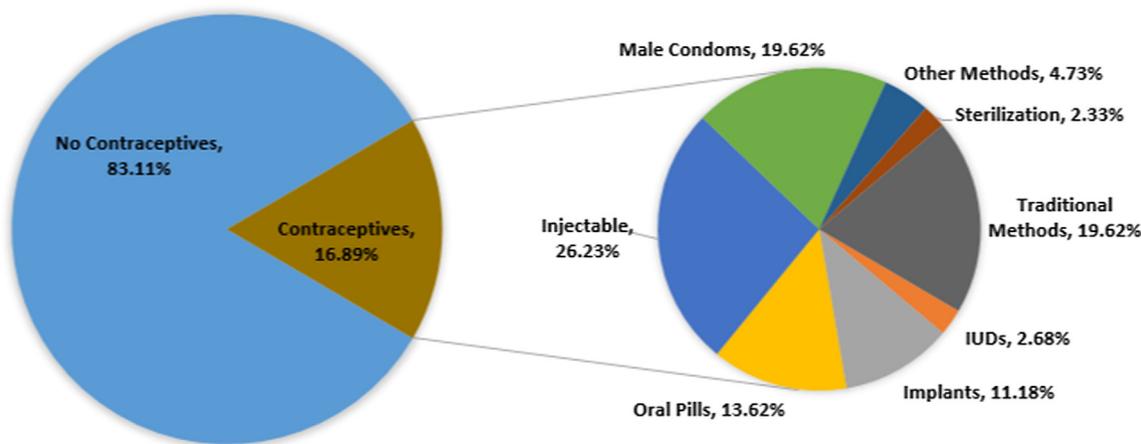
Fig. 2. Distribution of current contraceptive methods used in sub-Saharan Africa.

[95% CI 1.10, 1.17], respectively). Likewise, women 25 years and older were more likely to use contraceptives; 25–34 years (aPR 1.08 [95% CI 1.05, 1.11], aged 35–49 (aPR 1.11 [95% CI 1.07, 1.15]. Women who had prior HIV testing were 31% more likely to use contraceptives as those who did not get tested. Surprisingly, living in urban areas was negatively associated with contraceptive use (aPR 0.88 [95% CI 0.85, 0.92].

Contraceptive preference methods by country stratified

Overall, injectable was the most preferred method of contraception in this study (26%), followed by male condoms and traditional methods (20%), oral pills (14%), implants (11%), other methods (5%), IUDs (3%), and sterilization (2%) (Fig. 2).

Preference of contraceptive methods by country are presented in Table 3. Injectable was the most preferred method of contraception in Burkina Faso (32%), Burundi (38%), Gambia (45%), Ghana (31%), Liberia (58%), Mali (37%), Senegal (37%), and Uganda (46%). Male condoms was the most preferred method of contraception in Angola (45%), Cameroon (45%), Guinea (28%), Nigeria (30%), and Togo (27%). Oral pills were the preferred method in Ivory Coast (32%) and Niger (45%). Lastly, the traditional methods were the most preferred method in Benin (29%) and Congo (54%).

Discussion

Findings from our study reveal the existence of heterogeneity and disparities in the use of contraceptives across SSA countries. Our results showed an overall low contraceptive use prevalence of 17% in our sample. More significantly, we found substantial variations in the prevalence of contraceptive use in these 17 countries, with the highest rate of only 29% (Uganda). The between-country differences remained even after adjusting for other factors associated with contraceptive use. These results suggest the need to increase family planning intervention programs and awareness in SSA at the national and regional levels by various sectors.

Effective family planning through contraception could contribute to slower population growth and increase country economic development. In 2013, SSA regions reported a total fertility rate (TFR) of 5.1, twice the rate recorded in South Asia (2.8) and in Latin America and the Caribbean (2.2) [18]. Previous studies have showed that lack of contraceptive use in low and middle income countries (LMICs) results in unwanted pregnancies and high fertility rates [22,23], with significant repercussions for women's and household economic well-being, population growth, and eventually for regional economic development [24,25]. Contraception or family planning long-term economic benefits have been reported through three main pathways: reduction of maternal mortality, enhancement of child health, and improvement of family economic well-being [26].

Table 3
Contraceptive Preference methods by country stratified.

Countries	IUD	Implants	Oral Pills	Injectable	Male condoms	Other methods	Sterilization	Traditional Methods	Total
Mali	43 (3.89)	262 (23.73)	301 (27.26)	405 (36.68)	17 (1.54)	55 (4.98)	14 (1.27)	7 (0.63)	1104
Togo	54 (2.96)	382 (20.91)	158 (8.65)	486 (26.60)	488 (26.71)	17 (0.93)	14 (0.77)	228 (12.48)	1827
Benin	68 (2.97)	126 (5.50)	212 (9.25)	287 (12.52)	531 (23.17)	390 (17.02)	20 (0.87)	658 (28.71)	2292
Congo	18 (0.57)	70 (2.21)	115 (3.62)	137 (4.32)	751 (23.66)	277 (8.73)	106 (3.34)	1700 (53.56)	3174
Ghana	38 (1.83)	359 (17.24)	351 (16.86)	635 (30.50)	207 (9.94)	57 (2.74)	101 (4.85)	334 (16.04)	2082
Niger	11 (0.72)	42 (2.76)	683 (44.85)	230 (15.10)	14 (0.92)	151 (9.91)	18 (1.18)	374 (24.56)	1523
Angola	11 (0.75)	31 (2.12)	297 (20.34)	285 (19.52)	661 (45.27)	48 (3.29)	6 (0.41)	121 (8.29)	1460
Gambia	27 (3.95)	22 (3.22)	158 (23.10)	308 (45.03)	76 (11.11)	30 (4.39)	37 (5.41)	26 (3.80)	684
Guinea	17 (2.20)	9 (1.17)	146 (18.94)	136 (17.64)	219 (28.40)	40 (5.19)	8 (1.04)	196 (25.42)	771
Nigeria	304 (4.88)	101 (1.62)	762 (12.24)	987 (15.86)	1837 (29.51)	443 (7.12)	98 (1.57)	1693 (27.20)	6225
Uganda	197 (3.64)	888 (16.39)	256 (4.72)	2506 (46.25)	534 (9.86)	108 (1.99)	363 (6.70)	566 (10.45)	5418
Burkina	33 (1.23)	543 (20.25)	505 (18.84)	867 (32.34)	526 (19.62)	20 (0.75)	25 (0.93)	162 (6.04)	2681
Liberia	4 (0.21)	193 (10.31)	441 (23.56)	1084 (57.91)	58 (3.10)	13 (0.69)	16 (0.85)	63 (3.37)	1872
Senegal	181 (5.92)	1030 (33.69)	398 (13.02)	1144 (37.42)	112 (3.66)	87 (2.85)	32 (1.05)	73 (2.39)	3057
Burundi	97 (3.22)	627 (20.80)	182 (6.04)	1147 (38.04)	244 (8.09)	86 (2.85)	72 (2.39)	560 (18.57)	3015
Cameroon	29 (0.79)	81 (2.22)	257 (7.04)	368 (10.08)	1628 (44.59)	87 (2.38)	61 (1.67)	1140 (31.22)	3651
Ivory coast	11 (0.58)	12 (0.63)	597 (31.59)	193 (10.21)	478 (25.29)	114 (6.03)	4 (0.21)	481 (25.45)	1890

The prevalence of contraceptive use was lower in countries with Muslim majorities such as Gambia, Guinea, Mali, and Niger. This could be explained by the fact that Muslim women are more reluctant to use contraceptives compared to women in other religions [27–29]. Furthermore, within-country variation in contraceptive use could also be attributed to the potential influence of cultures where acceptance of contraceptives use is very limited [30,31]. In addition, our findings also revealed an internal heterogeneity regarding the preferred method of contraception within each country. Overall, the women in our study using contraceptives preferred the injectable method. This finding is consistent with previous studies that also found injectable contraception to be a commonly used contraceptive method among women of reproductive age in SSA [4,12,32]. Our results are also in agreement with a previous study that found increased use of contraception among unmarried women in SSA countries compared to married women [4].

Our findings also revealed that higher socioeconomic status (SES), marital status, education, being sexually active, having a prenatal nurse/midwife or doctor, visiting a healthcare facility, having a television set, literacy, having living children, and prior HIV testing were significant predictors of contraceptive use among SSA women. The positive association between higher SES and contraceptive use was not surprising. There have been several previous studies which also found higher levels of contraceptive use among women in higher socio-economic groups [18,33–37]. In many SSA countries, access to contraceptives is not free of charge [35,38]. Women of low SES may not have the financial means to pay for contraceptives, which may result in an increased likelihood of unintended pregnancies and maternal mortality rates due to unsafe abortions. Wealth disparity in access to contraceptives among women highlights the need for financial support from domestic resources and international funding to support reproductive health and to increase contraceptive uptake among women of lower SES in SSA.

In line with previous studies, we found that visits to the healthcare facility was positively associated with contraceptive use. Consistent with our finding, several previous studies also found that women who visit healthcare facilities for prenatal, childbirth, child immunization, and postnatal care were significantly more likely to use modern contraceptive methods than women who do not [15,19–21]. Interaction and discussions between healthcare providers and women may facilitate women's willingness to use contraceptives. During routine visits, healthcare providers may ask whether women use any methods of modern contraception and counsel them about family planning and available support services [39]. According to previous studies, healthcare providers are the primary source of contraceptive information and women are more likely to receive family planning information in the hospital [40,41]. Furthermore, a study conducted by Wulifan and colleague (2017) indicated that women who live at least 5 km away from a health facility were less likely to use contraception [18]. Similarly, our study found that use of modern contraceptives was significantly associated with exposure to media such as television. This was not surprising and well aligned with previous studies that found that women who were exposed to family planning information in the media, such as television, were more likely to be using contraception compared to those who were not [14,17,21,34,36]. In SSA, most of the family planning campaigns run on radio, television, and magazines. Mass media is the most effective route to spread message about contraceptive use. Family planning studies in Kenya and Bangladesh have reported increase in utilization of contraceptive methods as a result of exposure to mass media [42–44]. In addition, we found that educated women had higher odds of using contraception compared to uneducated women. This finding is consistent with previous studies that also found that knowledge of modern contraceptive use increased with increased education [34,45,46].

Study strengths and limitations

This study used nationally representative data from 17 SSA countries to investigate factors associated with contraceptive use in these countries. This study adds to the body of literature on contraceptive use in SSA countries by including predictors of contraceptive use in these countries. This knowledge will assist with family planning education and interventions in these countries and in the region as a whole.

However, the study has some limitations that need to be addressed. First, the cross-sectional nature of the survey does not allow for the determination of a temporal or causal relationship between the predictors and contraceptive use among women. In addition, this study did not include all 48 SSA countries. Despite these limitations, this study provides useful information concerning contraceptive use in SSA and associated factors among women of reproductive age.

Conclusion

We found considerable variation in contraceptive use and type of contraception preferred among the 17 SSA countries studied. The factors most strongly associated with use of contraception among the women in this study were: higher socioeconomic status, literacy, visiting a healthcare facility in the previous 12 months, being sexually active, prior HIV testing, having between 5 and 7 living children and having never married

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References

[1] U. National Research Council Working Group on Factors Affecting Contraceptive, in Factors Affecting Contraceptive Use in Sub-Saharan AfricaWashington (DC): National Academies Press (US) Copyright 1993 by the National Academy of Sciences. All rights reserved., 1993.

[2] Van Balen H, Ntabomvura V. Methods of birth spacing, maternal lactation and post partum abstinence in relation to traditional African culture (in eng). J Trop Pediatr Environ Child Health Apr 1976;22(2):50–2.

[3] Economic Commission for Africa 1984. Kilimanjaro Plan of Action. Second African Population Conference, Arusha, Tanzania, January 9–13.

[4] Tsui AO, Brown W, Li Q. Contraceptive practice in sub-Saharan Africa. Popul Develop Rev 2017;43(1):166–91.

[5] Gakidou E, Vayena E. Use of modern contraception by the poor is falling behind, (in eng). PLoS Med Feb 2007;4(2):e31.

[6] Nyongesa Paul, Odunga Jack. Contraceptive use in sub-Saharan Africa: the socio-cultural context. Int J Public Health Res 2015;3(6):336–9.

[7] Larsson C, Stanfors M. Women's Education, Empowerment, and Contraceptive Use in sub-Saharan Africa. Findings from Recent Demographic and Health Surveys. 2014. p. 1022–34.

[8] Blackstone SR, Nwaozuru U, Iwelunmor J. Factors influencing contraceptive use in sub-Saharan Africa: a systematic review, (in eng). Int Q Community Health Educ Jan 2017;37(2):79–91.

[9] Hounton S, et al. Patterns and trends of contraceptive use among sexually active adolescents in Burkina Faso, Ethiopia, and Nigeria: evidence from cross-sectional studies. Global Health Action 2015;8:29737.

[10] Emina JB, Chirwa T, Kandala NB. Trend in the use of modern contraception in sub-Saharan Africa: does women's education matter? (in eng). Contraception Aug 2014;90(2):154–61.

[11] Mishra V, et al. HIV testing in national population-based surveys: experience from the demographic and health surveys, (in eng). Bull World Health Organ Jul 2006;84(7):537–45.

[12] Lunani LL, Abaasa A, Omosa-Manyonyi G. Prevalence and factors associated with contraceptive use among Kenyan women aged 15–49 years, (in eng). AIDS Behav Jul 2018;22(Suppl 1):125–30.

[13] Spiegelman D, Hertzmark E. Easy SAS calculations for risk or prevalence ratios and differences, (in eng). Am J Epidemiol 2005;162(3):199–200.

[14] Awusabo-Asare K, Abane AM, Kumi-Kyereme A. Adolescent Sexual and Reproductive Health in Research Evidence. New York, NY: Guttmacher Institute; 2004.

[15] Gupta N, Katende C, Bessinger R. Associations of mass media exposure with family

planning attitudes and practices in Uganda, (in eng). Stud Fam Plann Mar 2003;34(1):19–31.

[16] Boamah EA, Asante KP, Mahama E, et al. Use of contraceptives among adolescents in Kintampo, Ghana: a cross-sectional study. Open Access J Contra 2014;2014(5):7–15.

[17] Chima V and Alawode OA. Modern contraceptive use among female adolescents in rural Nigeria: Does exposure to family planning messages matter? A cross-sectional study [version 1; peer review: 1 approved]. Gates Open Res 2019, 3:627 (https://doi.org/10.12688/gatesopenres.12904.1).

[18] Wulifan JK, et al. Factors associated with contraceptive use among women of reproductive age in rural districts of Burkina Faso, (in eng). J Health Care Poor Underserved 2017;28(1):228–47.

[19] Masho SW, et al. Postpartum visit attendance increases the use of modern contraceptives, (in eng). J Pregn 2016;2016:2058127.

[20] Akinlo A, Bisiriyu A, Esimai O. Use of maternal health care as a predictor of postpartum contraception in Nigeria. Etude de la Population Africaine 2014;27(2):288.

[21] Ajayi AI, Adeniyi OV, Akpan W. Maternal health care visits as predictors of contraceptive use among childbearing women in a medically underserved state in Nigeria. J Health Popul Nutr 2018;37(1):19.

[22] Okonofua FE, Odimegwu C, Ajabor H, Daru PH, Johnson A. Assessing the prevalence and determinants of unwanted pregnancy and induced abortion in Nigeria, (in eng). Stud Fam Plann Mar 1999;30(1):67–77.

[23] USAID. Family planning and the MDGs: saving lives, saving resources. Washington, DC: USAID, 2009. Available at: http://pdf.usaid.gov/pdf_docs/Pnadp910.pdf.

[24] Bongaarts and J. Bruce, The Causes of Unmet Need for Contraception and the Social Content of Services. 1995, pp. 57–75.

[25] Sengh G, Hussain R, Bankole A, et al. Women with an unmet need for contraception in developing countries and their reasons for not using a method. New York, NY: Guttmacher Institute, 2007. Available at: https://www.guttmacher.org/sites/default/fi les/pdfs/pubs/2007/07/09/or37.pdf.

[26] Levine R, Langer A, Birdsall N, et al. Contraception. In: Jamison DT, Breman JG, Measham AR, et al., editors. Disease Control Priorities in Developing Countries. 2nd edition. Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2006. Chapter 57. Available from: https://www.ncbi.nlm.nih.gov/books/NBK11771/ Co-published by Oxford University Press, New York.

[27] Najafi-Sharjabad F, Yahya SZ, Hejar Abdul Rahman MH, Manaf RA. Barriers of modern contraceptive practices among Asian women: a mini literature review, (in eng). Glob J Health Sci 2013;5(5):181–92.

[28] Mishra, V. K. (2004). Muslim/non-muslim differentials in fertility and family planning in India.

[29] Morgan SP, Stash S, Smith HL, Mason KO. Muslim and non Muslim differences in female autonomy and fertility: evidence from four Asian countries. Popul Develop Rev 2002;28(3):515–37. https://doi.org/10.1111/j.1728-4457.2002.00515.x.

[30] Srikanthan, A., & Reid, R. L. (2008). Religious and cultural influences on contraception. JOGC-TORONTO-, 30(2), 129.

[31] Shah NA, Nisar N, Qadri MH. Awareness and pattern of utilizing family planning services among women attending urban health care center Azizabad Sukkur. Pak J Med Sci 2008;24(4):550–5.

[32] United Nations. Department of Economic and Social Affairs. Population Division. 2016b World Contraceptive Use 2015 (POP/DB/CP/Rev2015) http://www.un.org/en/development/desa/population/publications/dataset/contraception/wcu2015.shtml. Accessed December 27, 2018.

[33] Woldemicael G, Beaujot R. Currently married women with an unmet need for contraception in Eritrea: profi le and determinants. Can Stud Popul 2011;38(1-2):61–81.

[34] Rutaremwa G, Kabagenyi A, Wandera SO, Jhamba T, Akiror E, Nviiri HL. Predictors of modern contraceptive use during the postpartum period among women in Uganda: a population-based cross sectional study, (in eng). BMC Public Health 2015;15:262.

[35] Nketiah-Amponsah E, Arthur E, Aaron A. Correlates of contraceptive use among Ghanaian women of reproductive age (15–49 years), (in eng). Afr J Reprod Health 2012;16(3):155–70.

[36] Stephenson R, Baschieri A, Clements S, Hennink M, Madise N. Contextual influences on modern contraceptive use in sub-Saharan Africa, (in eng). Am J Public Health 2007;97(7):1233–40.

[37] Haider TL, Sharma M. Barriers to family planning and contraception uptake in sub-Saharan Africa: a systematic review. Int Quart Commun Health Educ 2013;33(4):403–13. 2013/10/01.

[38] Adebowale SA, Adedini SA, Ibisomi LD, Palamuleni ME. Differential effect of wealth quintile on modern contraceptive use and fertility: evidence from Malawian women, (in eng). BMC Womens Health 2014;14(1):40.

[39] Barber SL. Family planning advice and postpartum contraceptive use among low-income women in Mexico, (in eng). Int Fam Plan Perspect Mar 2007;33(1):6–12.

[40] Omo-Aghoja LO, et al. Factors associated with the knowledge, practice and perceptions of contraception in rural southern Nigeria, (in eng). Ghana Med J 2009;43(3):115–21.

[41] Utoo BT, Mutihir TJ, Utoo PM. Knowledge, attitude and practice of family planning methods among women attending antenatal clinic in Jos, North-central Nigeria, (in eng). Niger J Med 2010;19(2):214–8.

[42] Islam MR, Islam MA, Banowary B. Determinants of exposure to mass media family planning messages among indigenous people in Bangladesh: a study on the Garo, (in eng). J Biosoc Sci Mar 2009;41(2):221–9.

[43] Westoff CF, Rodriguez G. The mass media and family planning in Kenya. Int Family Plann Persp 1995;21(1):26–36.

[44] Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda, (in eng). Lancet 2006;368(9549):1810–27.

[45] Aryeetey R, Kotoh AM, Hindin MJ. Knowledge, perceptions and ever use of modern contraception among women in the Ga East District, Ghana, (in eng). Afr J Reprod Health 2010;14(4):26–31.

[46] Crissman HP, Adanu RM, Harlow SD. Women's sexual empowerment and contraceptive use in Ghana, (in eng). Stud Fam Plann Sep 2012;43(3):201–12.