

# BMJ Open Determinants of modern contraceptive use among married women of reproductive age: a cross-sectional study in rural Zambia

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**To cite:** Lasong J, Zhang Y, Gebremedhin SA, *et al.* Determinants of modern contraceptive use among married women of reproductive age: a cross-sectional study in rural Zambia. *BMJ Open* 2020;**10**:e030980. doi:10.1136/bmjopen-2019-030980

► Prepublication history for this paper is available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2019-030980>).

Received 09 April 2019  
Revised 17 December 2019  
Accepted 02 January 2020



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## ABSTRACT

**Objective** Zambia is among the world's top 10 countries with higher fertility rate (5.5 births/woman); unmet family planning need for births spacing (14%) and limiting births (7%). Women in rural Zambia (24%) are reported to have unmet need for family planning than those in urban areas (17%). This study was conducted to ascertain factors associated with modern contraceptive use among rural Zambian women.

**Design** Cross-sectional study.

**Setting** Rural Zambia.

**Participants** Secondary data of 4903 married or cohabiting rural women (15–49 years) after filtering out the pregnant, urban based and unmarried women from 2013 to 2014 Zambian Demographic and Health Survey (ZDHS) were analysed using SPSS V.22. Multiple logistic regression, Pearson's  $\chi^2$  and descriptive statistics were performed to examine factors associated with modern contraceptive use.

**Results** Factors that were positively associated with contraceptive use were respondent's education (secondary adjusted ORs (AOR) = 1.61,  $p \leq 0.002$ ); higher (AOR = 2.39,  $p \leq 0.050$ ), wealth index (middle class, (AOR) = 1.35,  $p \leq 0.005$ ); rich (AOR) = 2.04,  $p \leq 0.001$ ) and richest (AOR) = 1.95,  $p \leq 0.034$ ), high parity (1–2 (AOR) = 5.31,  $p \leq 0.001$ ); 3–4 (AOR) = 7.06,  $p \leq 0.001$ ); 5+ (AOR) = 8.02,  $p \leq 0.001$ ), men older than women by <10 years (AOR) = 1.50,  $p \leq 0.026$ ) and women sensitised about family planning at health facility (AOR) = 1.73,  $p \leq 0.001$ ). However, old age (40–49 years (AOR) = 0.49,  $p \leq 0.001$ ), other religions (Protestants, African traditionalists and Muslims) (AOR) = 0.77,  $p \leq 0.007$ ), ever had pregnancy miscarried, aborted or stillbirth (AOR) = 0.78,  $p \leq 0.026$ ) and women without knowledge of number of children husband desires (AOR) = 0.71,  $p \leq 0.001$ ) were negatively associated with contraceptive use.

**Conclusion** Modern contraceptive use in rural Zambia among currently married women of reproductive age group is relatively low (43%). We recommend that appropriate interventions are instituted to increase contraceptive access and use especially among uneducated older rural Zambian women.

## INTRODUCTION

Contraception describes pregnancy prevention by inhibiting the normal process of

## Strength and limitations of the study

- A major strength of the study is that data used are nationally representative from rural settings among targeted sexually active population in a developing country in sub-Saharan Africa.
- The handling of outliers and requisite fine-tuning of complex survey design is another strength of the study.
- Our study reveals varied correlates of modern contraceptive use among rural Zambians (old women, 40–49 years), married women with different religious faith (beliefs) and the uneducated.
- We used only 2013/2014 DHS data in the study and therefore results may be limited to modern contraceptive usage in rural Zambia for this period.
- The study was limited to only rural Zambian married or cohabiting women without men's perspectives on contraceptive use.

ovulation, fertilisation and implantations.<sup>1</sup> Varied modern contraceptive methods have been developed including male and female condoms, oral hormonal pills, intrauterine device (IUD), implants, male and female sterilisation (vasectomy and tubal ligation), injectables, vaginal barriers and emergency contraception.<sup>2</sup> Use of modern contraceptive methods allows couples and individuals to attain their desired number of children and determine spacing of pregnancies. This helps to reduce maternal deaths and child mortality by preventing unsafe abortions, birth injuries and all other complications that happen due to pregnancy.<sup>3 4</sup> Effective use of contraceptive methods facilitate reduction of maternal mortality by preventing teenage pregnancies and space births at specific durations.<sup>5 6</sup> Evidence has shown that children born within 2 years of spacing interval are two times more likely



to die in the first year of life than those born after an interval of at least 2 years.<sup>7</sup>

In 2015, 12% of married or cohabiting women were projected globally to have an unmet need for family planning; thus, they desired to stop or delay childbearing but were without any method of contraception. This level was much higher (22%) in the least developed countries with sub-Saharan Africa recording the highest (24%) unmet needs, double the world average in 2015 with total fertility rate of 4.7 births/woman.<sup>2,8</sup> In general, unmet need is high where contraceptive prevalence is low. Unmet need in 2015 was highest (above 20%) in the regions of Eastern, Central and Western Africa, Melanesia, Micronesia and Polynesia.<sup>8,9</sup> If all women with unmet need for family planning were to use modern contraceptive methods, unwanted pregnancies and maternal mortality were projected to decline by 70% and 67% annually.<sup>8,10</sup>

Among developing countries in sub-Saharan Africa, Zambia has an estimated population of 15.9 million people with 60% residing in rural and 40% in urban areas, respectively.<sup>11</sup> Despite the slight decrease in fertility rate from 6.75 births per woman in 1955 to 5.5 births per woman in 2015 and increased family planning use from 9% in 1992 to 45% in 2013–2014, Zambia is still among the top 10 countries with high fertility rate.<sup>8,11,12</sup> Women in rural areas have high fertility rate (6.6 children per woman) compared with women in urban areas (3.7 children per woman).<sup>12</sup> Prevalence rate of modern contraceptive use is at 45% which also varies among rural and urban women. In rural areas, every four in 10 women use modern contraceptive methods compared with 53% of married women in urban areas (53% and 39%, respectively).<sup>12</sup> Unmet need for family planning is also high among rural women (24%) as compared with women in urban areas (17%).<sup>12</sup>

Previous studies have identified several factors associated with modern contraceptive use which were either analogous or contrasting depending on the study site, ranging from sociodemographic, socioeconomic and sociocultural factors. Studies have shown that modern contraceptive methods were highly used by women with higher education, families with higher income, women who were exposed to mass media, women who desire for another child after 2 years, women empowerment, high parity and knowledge about family planning.<sup>13–22</sup> Other studies also found that women who were visited by health workers and were informed about family planning methods at health facilities were more likely to use contraceptive methods than their counterparts.<sup>23–25</sup> The desire of a husband to have another child is reported to be negatively correlated with the use of contraceptive methods.<sup>16,22–26</sup> In Zambia, studies have revealed that woman's age, partner's age, area of residence, woman and husband/partner educational levels, working status, desire for more children, ethnicity, number of living children and age at first birth were factors commonly associated with modern contraceptive use.<sup>27,28</sup> However, these results were generalised for both rural and urban resident

women in Zambia and thus; our study focused specifically on women resident in rural Zambia.

Rural-based women have limited access to health services including family planning compared with urban resident women. Using the data from the Zambian Demographic and Health Survey (ZDHS), we assessed factors associated with modern contraceptive use among married and cohabiting women in rural Zambia. It is estimated that Zambia have more than half of its population resident in rural areas (60%) with a corresponding rate of fertility and unmet family planning need.<sup>11,12</sup> Identifying specific factors associated with contraceptive use among rural Zambians (women) will set the stage for prioritising interventions aimed at improving access to reproductive health service(s), inform comprehensive family planning programmes, and policy(ies) implementation on family planning; as this is critical for achieving sustainable development goal five.<sup>5</sup>

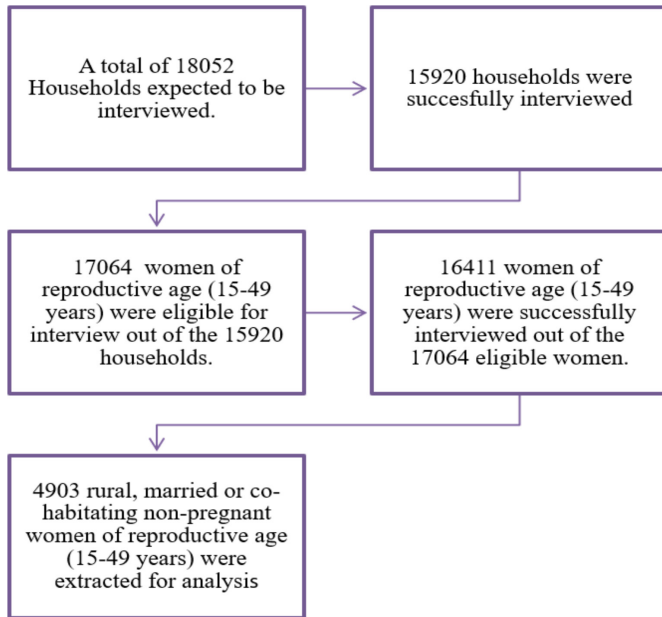
## METHODS

### Data source and methods

This was a cross-sectional study that used secondary data sourced from the 2013–2014 ZDHS. The authors accessed the data by requesting it from the Demographic Health Survey Program Team through online (<http://dhsprogram.com/>). The survey was conducted from August 2013 to April 2014, and a sample size of 18 052 households was drawn from the 2013–2014 ZDHS. The survey used a two-stage stratified cluster sample design, with enumeration areas (EAs) (or clusters) selected during the first stage and households selected during the second stage. In the first stage, 722 EAs (305 in urban areas and 417 in rural areas) were selected with probability proportional to size. Zambia is now administratively divided into 10 provinces (Central, Copperbelt, Eastern, Luapula, Lusaka, Muchinga, Northern, North Western, Southern and Western).<sup>12</sup> Stratification was achieved by separating each province into urban and rural areas; the 10 provinces were stratified into 20 sampling strata. In the second stage, a complete list of households served as the sampling frame in the selection of households for enumeration. An average of 25 households was selected in each EA with a representative sample of 18 052 households was selected.<sup>12</sup> Out of 18 052 selected households, 15 920 were successfully interviewed with 98% response rate. Out of the interviewed households, a total of 17 064 women aged 15–49 were eligible for individual interviews, and 96% of these women were successfully interviewed (16 411).<sup>12</sup> This study was limited to 4903 married or cohabiting rural-based women aged between 15 and 49 years after filtering out the pregnant, urban-based and unmarried women (figure 1).

### Patient and public involvement

Patients and the public were not directly involved in the design or planning of the study.



**Figure 1** A schema of data cluster.

## VARIABLES

### Dependent variable

The outcome variable was ‘use of modern contraceptives’; it was binary in nature with users indicated by 1 and non-users indicated by 0. It was measured as whether rural-based women of reproductive age (15–49 years), non-pregnant, married or cohabiting were current users of modern contraceptive.

### Independent variables

Several independent variables were used to predict modern contraceptive use among rural-based women. These variables included age years (15–19, 20–29, 30–39 and 40–49 years), respondent and husband/partner educational level (no education, primary, secondary and higher education), religion (Catholics and other religions), wealth index (poorest, poorer, middle, richer and richest), respondent currently working (no/yes), have you ever had a pregnancy that miscarried, was aborted, ended in a stillbirth? (no/yes), parity (0, 1–2, 3–4 and 5+), age difference (woman same age or older than man, man older <10 years and man older than ≥10 years), mass media exposure (not exposed, exposed to at least one media, exposed to at least two media and exposed to all media), domestic violence (no/yes), women empowerment (no/yes), husband desire for children (0=both want same, 1=husband wants more and 2=husband want fewer and did not know), access to family planning services variables were as follows: women visited by family planning health worker within 12 months (0=no, 1=yes) and women who were told about family planning at health facility (0=no/yes).

Age difference was calculated by subtracting the husband/partner age with respondent age and grouped. Mass media exposure variable was formed from the following questions. (1) Ever heard of family planning

on radio in the last few months? (2) Ever heard of family planning on television in the last few months? (3) Ever heard of family planning in newspapers or magazines in the last few months? A score of ‘0’ showed not exposed and was coded as ‘0’, a score of 1 indicated exposed to at least one media and was coded as ‘1’, score of ‘2’ measured exposure to at least two media and it was coded as ‘2’ and a score of ‘3’ measured exposure to all media and it was coded as ‘3’. Domestic violence variable was formed by adding physical violence plus sexual violence plus emotional violence.<sup>8</sup> Domestic violence was indicated if a woman scored from 1 to 3 and it was coded as ‘1’ and no domestic violence was indicated if a woman scored ‘0’. Woman empowerment variable was formed from the following questions. (1) Who decides on respondent’s healthcare? (2) Who decides on large house hold purchase? (3) Who decides on house hold purchase for daily needs? (4) Who decides on visiting family or relatives? A score from 1 to 4 indicated woman empowerment and it was coded as ‘1’ and a score of 0 indicated no woman empowerment and it was coded as ‘0’.

## Data quality and management

### Non-sampling error

During data collection, numerous efforts are made to reduce the possible sources of bias in all DHS data. Non-sampling errors that can result from mistakes made in implementing data collection and data processing, such as the failure to locate and interview the selected households, misunderstanding of the questions by interviewers or respondents and data entry errors.

### Sampling error

Survey weights associated with sampling design and non-responses were computed and utilised to reduce the bias that might occur in estimation process of complex sampling designs. The processing of the data began in September 2013, 1 month after data collection commenced and continued concurrently with the field-work. This offered an advantage because data were consistently checked and feedback was given to field teams, thereby improving data quality. Before being sent to the data-processing centre in Lusaka, completed questionnaires were edited in the field by the field editors and checked by the supervisors. At the processing centre, data were edited and coded by office editors. Data were then entered using the CSPro computer package. All data were entered twice for 100% verification. This double entry of data enabled easy comparisons and identification of errors and inconsistencies. Inconsistencies were resolved by tallying the data with the paper questionnaire entries. Further inconsistencies and missing data that were identified were resolved through secondary editing of the data.<sup>12</sup>

## Statistical analyses

The International Business Machine Statistical Package for Social Sciences (V.22) software was used for the data

analyses. Descriptive statistics was performed and results were presented as proportions (%) for categorical variables. Univariate and binary logistic regression analyses were performed to examine the association between modern contraceptive use (dependent variable) and each sociodemographic factors (independent variables). We also performed multiple logistic regression analysis to assess factors associated with contraceptive use after controlling for all potential confounders. The results of multiple logistic regressions were given as OR, 95% CI and p-value was used to assess the statistical significance ( $p \leq 0.05$ ).

## RESULT

### Background characteristics

The sociodemographic characteristics of 4903 Zambian married/cohabiting women of reproductive age (15–49 years) living in rural areas indicate that 43% of the respondents were current users of modern contraceptives, while the mean and SD of the women and their partner's age were (31.9±8.6 years) and (38.9±10.3 years), respectively (table 1). Primary education was accessed by 66.0% of the women and 51.9% by their partners. Other religion (Protestants, Muslims and Africa traditionalists) were the common type of religion among the respondents (82.3%) with majority of the women poorer as indicated by wealth index (32%). Employment among the women respondents was at 61.4% and 43.1% of the respondents had more than five children. Less than a quarter 14.5% of the women were visited by family planning health workers during the last 12 months and 52.1% of the women were told about family planning at a health facility.

### Distribution of current modern contraceptive use among married rural women of reproductive age (15–49 years) by method type, Zambia 2013–2014 DHS

The distribution of contraceptive use among married rural-based Zambian women indicates that majority of the women used injectables (21.9%) followed by pills at 9.9% (figure 2). Implants, condom and sterilisation were 4.8%, 3.6% and 2.0%, respectively. IUD was at less than 1% and female condom was the rarest used method at 0.1%.

### Determinants of modern contraceptive use

Crude and adjusted ORs (AOR) were calculated to determine the strength of association between independent variables and contraceptive use (table 2). Women aged 40–49 years were (AOR=0.49;  $p \leq 0.001$ ) less likely to use modern contraceptive compared with women aged 15–19 years. Women with secondary (AOR=2.16;  $p \leq 0.002$ ) and higher education (AOR=2.39;  $p \leq 0.050$ ) were more likely to use contraceptive methods than uneducated women. Furthermore, women from other religions were (AOR=0.77;  $p \leq 0.007$ ) less likely to use modern contraceptive compared with Catholic women. Women from middle wealth index (AOR=1.35;  $p \leq 0.005$ ), richer

(AOR=2.04;  $p \leq 0.001$ ) and richest (AOR=1.95;  $p \leq 0.034$ ) were more likely to use modern contraceptive than the poorest women (table 2).

Compared with women with no child, women with one or two (AOR=5.31;  $p = 0.001$ ), three or four (AOR=7.06;  $p \leq 0.001$ ) and above five (AOR=8.02;  $p \leq 0.001$ ) children were more likely to use contraceptives. Women who were sensitised on contraceptive use at a health facility were 1.7 times (AOR=1.73;  $p \leq 0.001$ ) more likely to use contraceptive as compared with their counterparts. Women who did not know the number of children their husband want to have were 28% (AOR=0.71;  $p \leq 0.001$ ) less likely to use contraceptive than women who desired same number of children with their husband. Moreover, women with older husband/partner up to <10 years were 1.5 times (AOR=1.50;  $p \leq 0.026$ ) more likely to use contraceptive than women with the same age or older than husband. Furthermore, women who reported ever had pregnancy miscarried, aborted or stillbirth were (AOR=0.78;  $p \leq 0.026$ ) less likely to use contraceptive than women with never had a terminated pregnancy (table 2).

In addition, husband/partner's educational level, employment, visitation by a health worker, women empowerment and media exposure were significantly associated with contraceptive use in the crude analysis but the association disappeared after controlling for potential confounders. However, there was no association between domestic violence and contraceptive use (table 2).

## DISCUSSION

This study examined prevalence and factors associated with contraceptive use among married or cohabiting women of reproductive age (15–49 years) in rural Zambia. Less than half of rural women (43%) uses modern contraceptive methods. The findings revealed that secondary education, wealth index (middle class, rich and richest women), high parity, man older by <10 years, women sensitised about family planning at health facility were positively associated with contraceptive use. Conversely, old age (40–59 years), other religions (Protestants, Muslims and African traditionalists), ever had a terminated pregnancy and lack of knowledge by a woman of the number of children a husband desires were negatively correlated with contraceptive use (table 2).

Other researchers have reported that contraceptive use increases with young age (15–39 years) and decreases with old age (40–49 years). It is believed that most old aged women in their menopausal stage mostly due to decreased sexual activity are less likely to use contraceptive.<sup>9</sup> Our study revealed that old age (40–49 years) was negatively associated with contraceptive use compared with young age (15–19 years); which is consistent with reports from Malawi and Ethiopia.<sup>9–11</sup> However, we found that there was no significant association between women aged (20–29 years), (30–39 years) and contraceptive use. This study also revealed that women who were younger than their husband or partner with an age difference

**Table 1** Sociodemographic characteristics and association with modern contraceptive use among rural women of reproductive age (15–49 years) in Zambia (2013–2014)

Sociodemographic variable	Modern contraceptive use			$\chi^2$	P value
	Total=4903 N (%) <sup>*</sup>	No=2747 (57%) N (%) <sup>†</sup>	Yes=2156 (43%) N (%) <sup>†</sup>		
Age (years) <sup>‡</sup>				61.04	<0.001
15–19	306 (6.2)	186 (60.8)	120 (39.2)		
20–29	1806 (36.8)	968 (53.6)	838 (46.4)		
30–39	1689 (34.5)	871 (51.6)	818 (48.4)		
40–49	1102 (22.5)	722 (65.5)	380 (34.5)		
Religion				5.73	0.017
Catholics	865 (17.7)	453 (52.4)	412 (47.6)		
Other	4023 (82.3)	2286 (56.8)	1737 (43.2)		
Highest education level				70.651	<0.001
No education	719 (14.7)	474 (65.9)	245 (34.1)		
Primary	3230 (66.0)	1828 (56.6)	1402 (43.4)		
Secondary	886 (18.0)	419 (47.3)	467 (52.7)		
Higher	62 (1.3)	20 (32.3)	42 (67.7)		
Age difference <sup>‡</sup>				16.487	<0.001
Women same age or older than man	274 (5.7)	176 (64.2)	98 (35.8)		
Man older by <10 years	3658 (76.1)	1988 (54.3)	1670 (45.7)		
Man older by ≥10 years	874 (18.2)	522 (59.7)	352 (40.3)		
Wealth index				91.684	<0.001
Poorest	1536 (31.3)	979 (63.7)	557 (36.3)		
Poorer	1588 (32.4)	903 (56.9)	685 (43.1)		
Middle	1184 (24.2)	613 (51.8)	571 (48.2)		
Richer	480 (9.8)	206 (42.9)	274 (57.1)		
Richest	115 (2.3)	46 (40.0)	69 (60.0)		
Pregnancy miscarried, aborted or stillbirth				15.655	<0.001
No	4199 (85.7)	2304 (53.7)	1895 (44.2)		
Yes	703 (14.3)	442 (62.9)	261 (37.1)		
Respondent currently working				7.588	0.006
No	1882 (38.6)	1007 (53.5)	875 (46.5)		
Yes	2995 (61.4)	1723 (57.5)	1272 (42.5)		
Domestic violence				1.043	0.307
No	2228 (63.2)	1266 (56.8)	962 (43.2)		
Yes	1908 (36.8)	1054 (55.2)	854 (44.8)		
Husband/partner's educational level				44.089	<0.001
No education	404 (8.3)	248 (61.4)	156 (38.6)		
Primary	2529 (51.9)	1477 (58.4)	1052 (41.6)		
Secondary	1627 (33.4)	845 (51.9)	782 (48.1)		
Higher	178 (3.6)	70 (39.3)	108 (60.7)		
Do not know	139 (2.8)	87 (62.6)	52 (37.4)		
Media exposure <sup>‡</sup>				51.632	<0.001
Not exposed	3494 (71.4)	2060 (59.0)	1434 (41.0)		
Exposed to at least one media	1052 (21.5)	538 (51.1)	514 (48.9)		

Continued

Table 1 Continued

Sociodemographic variable	Modern contraceptive use			$\chi^2$	P value
	Total=4903 N (%)*	No=2747 (57%) N (%)†	Yes=2156 (43%) N (%)†		
Exposed to at least two media	259 (5.3)	109 (42.1)	150 (57.9)		
Exposed to all	87 (1.8)	35 (40.2)	52 (59.8)		
Women empowerment				6.427	0.011
No	466 (9.5)	287 (61.6)	179 (38.4)		
Yes	4432 (90.5)	2458 (55.5)	1974 (44.5)		
At health facility, told of family planning				63.553	<0.001
No	1572 (47.9)	948 (60.3)	624 (39.7)		
Yes	1711 (52.1)	794 (46.4)	917 (53.6)		
Parity‡				102.716	<0.001
0	155 (3.2)	147 (94.8)	8 (5.2)		
1–2	1234 (25.5)	702 (56.9)	532 (43.1)		
3–4	1402 (28.6)	738 (52.6)	664 (47.4)		
5+	2112 (43.1)	1160 (54.9)	952 (45.1)		
Visited by a health worker				21.095	<0.001
No	4188 (85.5)	2402 (57.4)	1786 (42.6)		
Yes	709 (14.5)	341 (48.1)	368 (51.9)		
Husband's desire for children				58.874	<0.001
Both want same	1814 (37.9)	952 (52.5)	862 (47.5)		
Husband wants more	1221 (25.5)	697 (57.1)	524 (42.9)		
Husband wants fewer	230 (4.8)	109 (47.4)	121 (52.6)		
Do not know	1522 (32.8)	982 (64.5)	540 (35.5)		

\*Column percentage.

†Row percentage,  $p \leq 0.05$ .

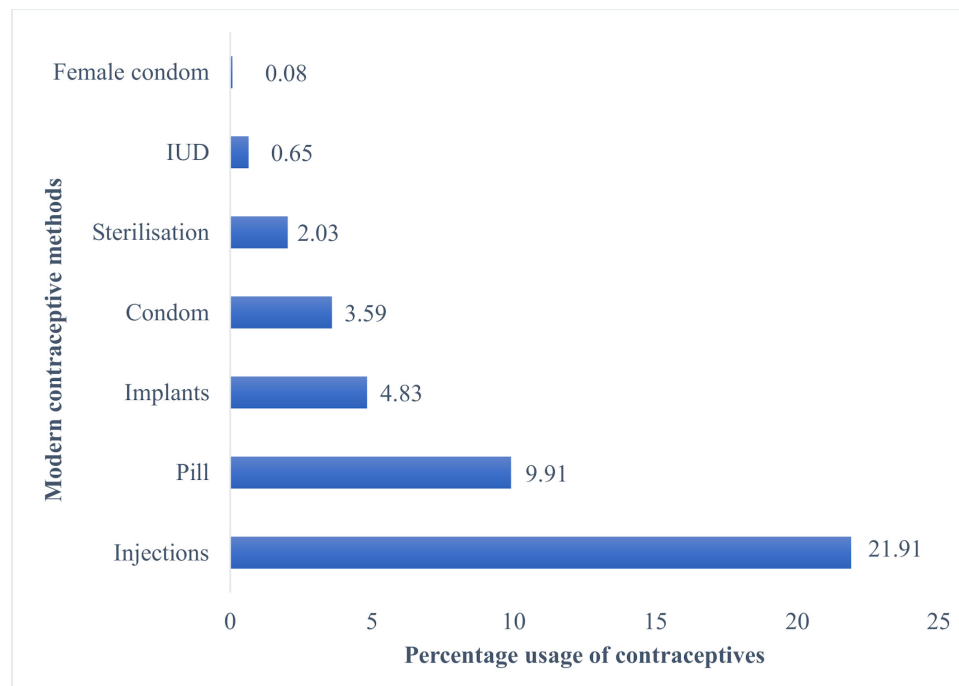
‡Recategorised.

of less than 10 years were more likely to use contraceptive than women who were older than their partners or husbands, confirming reports by Kidayi<sup>12</sup> in Tanzania.

Also, women's education is one of the most influential investment that can be made as this empowers women to delay marriage, childbearing and informed to make decision on modern contraceptive use than less educated women.<sup>13</sup> Many countries now support women's education both to foster economic growth and also to promote reasonable family sizes, improve child health and women's sexual reproductive health (modern contraceptive use).<sup>14</sup> Research has equally evidenced that education usually improves knowledge and attitude of women towards modern contraceptive use.<sup>13</sup> Previous studies have indicated that women with higher education are more likely to use contraceptive methods than women with no education.<sup>10 15–19</sup> This study corroborates previous studies revealing that women with secondary education were more likely to use contraceptive methods than uneducated women.<sup>17 29–31</sup>

Additionally, our study revealed that wealthier women were more likely to use contraceptives than poor women. This might be due the capacity to purchase modern contraceptives not necessarily relying on their partners. Our results corroborate other studies which established that wealthier women were more likely to use contraceptive methods than women of lower income.<sup>15 17 20–22 32</sup> This study indicates that women who do not know the number of children their husband desires were negatively associated with contraceptive use. In Zambian culture, a man is considered as the head of the family and this has an impact on the number of children a husband wants. This contradicts reports by Rutaremwa *et al*<sup>14</sup> and other studies that a husband's desire for fewer children was positively associated with contraceptive use.<sup>12 15 23</sup>

Moreover, increased parity was highly associated with contraceptive use compared with women who had no children; consistent with previous studies.<sup>9 11 16 17 20</sup> Our results showed that women who ever had a pregnancy miscarried, aborted or stillbirth were less likely to use contraceptives. This may be ascribed to the fact that, in



**Figure 2** Types of modern contraceptives and usage among rural Zambian married or cohabiting women of reproductive age, Zambia 2013–2014 DHS. Vertical axis represents modern contraceptive methods (injection, pills, implants, male condom, sterilisation, IUD and female condom). Horizontal axis shows percentage usage of contraceptives (the blue bars). IUD, intrauterine device.

sub-Saharan Africa, women usually have limited access to reproductive health information and services as infrastructure for that is virtually non-existent.<sup>9 19</sup> The Zambian gender norms also usually disfavour women who get pregnant without marriage.<sup>33</sup> Again, most African cultures forbid active sexual activity (fornication) especially among adolescent without marriage<sup>33 34</sup> and thus, abortion is forbidden. However, unsafe abortion is commonly practised using traditional concoctions and other unsafe methods.<sup>34</sup> Further research can be done to ascertain the specific impacts of miscarried pregnancy, abortion and stillbirth on contraceptive utilisation among rural Zambian women.

Additionally, the present study also revealed that religion is a major predictor of contraceptive use among women. Women belonging to other religions (African traditionalists, Muslims and Protestants) were less likely to use contraceptive methods than Catholics. This may be attributed to how young Zambian women interpret religious teachings. Further studies to describe generational and social–contextual differences in how women interpret and use religious doctrine to achieve their fertility desires without jeopardising their Catholic faith may be recommended. Our result is consistent with findings from Ethiopia which reported religion as a major predictor of contraceptive use.<sup>23</sup>

Again, information communicates messages to affect the behaviour, decision-making and outcome of any intervention. Information about family planning if conveyed to women plays a major role in contraceptive use. Studies have revealed that women who visit health

facilities and are sensitised on family planning methods are more likely to use contraceptive methods than women without relevant information.<sup>22 35 36</sup> Women with relevant information on family planning from health facilities positively correlates with contraceptive use. However, a study conducted by Okacho *et al*<sup>37</sup> showed that awareness and knowledge of contraceptives failed to automatically translate to usage. Married women in Kenya who declined to use contraceptives in the future frequently mentioned fear of side effects and health concerns as reason of discontinuation.<sup>37</sup>

Also, we recorded no significant relationship between domestic violence, husband/partner's educational level, respondent current occupation (working), visited by health worker, women empowerment and mass media exposure as against contraceptive use. However, a study in Malawi found that being visited by a family planning health worker was positively associated with contraceptive use which contradicts this study.<sup>38</sup> This might be due to communication approach by health workers in reaching out to the women. Women empowerment equips women to make decisions about their own health and better choices about family planning use.<sup>38</sup> Previous studies have revealed that empowered women are more likely to use contraceptive than women who were not empowered which is contrary to our study. Evidence from previous studies has showed that higher exposure to mass media increases contraceptive use among women. Mass media operates as a form of social learning and individuals benefit by gaining knowledge. Cultural influence may play a major role in women's decision-making regarding

**Table 2** Association between sociodemographic characteristics and current contraceptive use among women (15–49 years) in rural Zambia (logistic regression model)

Variable	Modern contraceptive use					
	Crude			Adjusted		
	OR	CI (95%)	P value	AOR	CI (95%)	P value
<b>Age (years)* (ref=15–19)</b>						
20–29	1.34	1.05 to 1.72	0.020	0.92	0.65 to 1.30	0.637
30–39	1.46	1.14 to 1.87	0.003	0.81	0.54 to 1.20	0.284
40–49	0.82	0.63 to 1.06	0.126	0.49	0.32 to 0.75	<0.001
<b>Highest education level (ref=no education)</b>						
Primary	1.48	1.25 to 1.76	<0.001	1.25	0.98 to 1.60	0.067
Secondary	2.16	1.76 to 2.64	<0.001	1.61	1.20 to 2.17	0.002
Higher	4.06	2.33 to 7.07	<0.001	2.39	1.00 to 5.72	0.050
<b>Religion (ref=Catholic)</b>						
Other	0.83	0.72 to 0.97	0.017	0.77	0.63 to 0.93	0.007
<b>Wealth index (ref=poorest)</b>						
Poorer	1.33	1.15 to 1.54	<0.001	1.10	0.91 to 1.32	0.333
Middle	1.64	1.40 to 1.91	<0.001	1.35	1.10 to 1.66	0.005
Richer	2.34	1.90 to 2.88	<0.001	2.04	1.50 to 2.81	<0.001
Richest	2.64	1.79 to 3.88	<0.001	1.95	1.05 to 3.62	0.034
<b>Husband/partner's educational level (ref=no education)</b>						
Primary	1.13	0.91 to 1.40	0.258	0.95	0.71 to 1.27	0.721
secondary	1.47	1.18 to 1.84	0.001	1.00	0.74 to 1.36	0.987
Higher	2.45	1.71 to 3.52	<0.001	0.80	0.44 to 1.45	0.466
Do not know	0.95	0.64 to 1.41	0.801	1.02	0.61 to 1.72	0.934
<b>Pregnancy miscarried, aborted or stillbirth (ref=no)</b>						
Yes	0.72	0.61 to 0.85	<0.001	0.78	0.63 to 0.97	0.026
<b>Respondent currently working (ref=no)</b>						
Yes	0.85	0.76 to 0.75	0.006	0.88	0.75 to 1.04	0.128
<b>Parity* (ref=0)</b>						
1–2	13.93	6.78 to 28.62	<0.001	5.31	2.22 to 12.68	<0.001
3–4	16.53	8.05 to 33.94	<0.001	7.06	2.95 to 16.92	<0.001
5+	15.08	7.36 to 30.88	<0.001	8.02	3.33 to 19.33	<0.001
<b>Visited by a health worker (ref=no)</b>						
Yes	1.45	1.24 to 1.70	<0.001	1.20	0.97 to 1.45	0.088
<b>At health facility, told family planning (ref=no)</b>						
Yes	1.75	1.53 to 2.02	<0.001	1.73	1.49 to 2.02	<0.001
<b>Women empowerment (ref=no)</b>						
Yes	1.29	1.06 to 1.57	0.011	1.19	0.90 to 1.56	0.227
<b>Husband's desire for children (ref=both want same)</b>						
Husband wants more	0.83	0.72 to 0.96	0.013	0.89	0.73 to 1.07	0.201
Husband wants fewer	1.23	0.93 to 1.61	0.146	1.33	0.94 to 1.87	0.109
Do not know	0.61	0.53 to 0.70	<0.001	0.71	0.59 to 0.86	<0.001
<b>Media exposure* (ref=not exposed)</b>						
Exposed to at least one media	1.37	1.20 to 1.58	<0.001	1.10	0.92 to 1.31	0.301
Exposed to at least two media	1.98	1.53 to 2.55	<0.001	1.21	0.86 to 1.71	0.265
Exposed to all	2.13	1.38 to 3.29	0.001	0.95	0.53 to 1.72	0.871
<b>Age difference* (ref=womensame age or older than man)</b>						
Man older by <10 years	1.51	1.17 to 1.95	0.002	1.50	1.05 to 2.14	0.026
Man older by ≥10 years		0.91 to 1.60	0.183	1.33	0.90 to 1.95	0.153

\*Recategorised.

AOR, adjusted OR; p, p-value at  $p \leq 0.05$ .



contraceptive use. Most rural Zambian women are small-holder farmers, logging and petty trading which might account for the lack of association between women's occupation (work) and contraceptive use.

### Study limitations

The cross-sectional nature of the data limits ability to draw casual inferences. Thus, the study could only look for associations, not causes and effects. Also, all assessments were based on self-reports by the participants with likely gross underestimates or overestimates which could undermine the true prevalence of modern contraceptive use in rural Zambia. We had no control over the selection of variables, quality of data and the measurements of indicators over the data set as it was secondary. We used only 2013/2014 DHS data in the study and therefore results may be limited to modern contraceptive usage in rural Zambia for this period. The study was limited to only rural Zambia among married or cohabiting women without men's perspectives on contraceptive use.

### CONCLUSION

Modern contraceptive use in rural Zambia among currently married or cohabiting women of reproductive age group is low (43%). Our results showed a negative relationship between religion and ever had pregnancy miscarried, aborted or stillbirth with contraceptive usage. Identifying generational and social-contextual differences on how women interpret and use religious doctrine to achieve their fertility desires vis-a-vis sociocultural and geotraditional barriers to using contraceptives should inform appropriate interventions to increase modern contraceptive access and use among uneducated rural Zambian women. Concerned stakeholders may target working with religious leaders in disseminating information about family planning as these leaders have a major influence on their followers. Promotion of women sexual reproductive health education ought to be encouraged to improve contraceptive use.

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**Acknowledgements** We thank the Demographic Health Survey Program (<http://dhsprogram.com/>) for the data. We acknowledge the contribution of Mr Kojo Ahiakpa in proofreading this manuscript.

**Contributors** Conceptualisation and drafting of the research was done by JL, ZH and ZK. ZY, SO, TM, CSA and SAG accomplished the statistical analysis, assisted in the interpretation of the results and drafted the manuscript. All authors contributed to the discussion of the paper, read and approved the final version.

**Funding** This work was supported by the National Natural Science Foundation of China (grant no. 8157060984, no. 81701539) and National Key Research and Development Plan (grant no. 2018YFC1004304).

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Ethics approval** This study used secondary data of freely available data online. The authors accessed the 2013–2014 ZDHS data by receiving permission through DHS measure online (<http://dhsprogram.com/>). The ZDHS received the ethical approval from Tropical Disease and Research Centre (TDRC) in Ndola, Zambia and the US Centre for Disease Control and Prevention (CDC) Atlanta's Research ethics review board.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Data are available in a public, open access repository. Data are available in a public, open access repository. Zambian Demographic Health Survey (ZDHS, 2013/2014), accessible online <http://dhsprogram.com/>.

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