Factors associated with decision-making power of married women to use family planning in sub-Saharan Africa: a multilevel analysis of demographic health surveys

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Abstract

Background: In sub-Saharan Africa, there are several socio-economic and cultural factors which affect women’s ability to make decision regarding their own health including the use of contraceptives. Therefore, the main aim of this study was to determine factors associated with decision-making power of married women to use family planning service (contraceptives) in sub-Saharan Africa.

Methods: The appended, most recent demographic and health survey datasets of 35 sub-Saharan countries were used. A total weighted sample of 83,882 women were included in the study. Both bivariable and multivariable multi-level logistic regression were done to determine the associated factors of decision-making power of married women to use family planning service in sub-Saharan countries. The Odds Ratio (OR) with a 95% Confidence Interval (CI) was calculated for those potential variables included in the final model.

Results: Married women with primary education (AOR = 1.24; CI:1.16,1.32), secondary education (AOR = 1.31; CI:1.22,1.41), higher education (AOR = 1.36; CI:1.20,1.53), media exposure (AOR = 1.08; CI: 1.03, 1.13), currently working (AOR = 1.27; CI: 1.20, 1.33), 1–3 antenatal care visits (AOR = 1.12; CI:1.05,1.20), ≥ 4 ANC visits (AOR = 1.14;CI:1.07,1.21), informed about family planning (AOR = 1.09; CI: 1.04, 1.15), having less than 3 children (AOR = 1.12; CI: 1.02, 1.23) and 3–5 children (AOR = 1.08; CI: 1.01, 1.16) had higher odds of decision-making power to use family planning. Mothers who are 15–19 (AOR = 0.61; CI: 0.52, 0.72), 20–24 (AOR = 0.69; CI: 0.60, 0.79), 25–29 (AOR = 0.74; CI: 0.66, 0.84), and 30–34 years of age (AOR = 0.82; CI: 0.73, 0.92) had reduced odds of decision-making power to use family planning as compared to their counterparts.

Conclusion: Age, women’s level of education, occupation of women and their husbands, wealth index, media exposure, ANC visit, fertility preference, husband’s desire in terms of number of children, region and information about family planning were factors associated with decision-making power to use family planning among married women.

Keywords: Decision-making power, Women, Family planning, Sub-Saharan Africa

Background

Sub-Saharan Africa (SSA) accounted for 66% of the maternal deaths globally and had the highest Maternal Mortality Ratio (MMR) at 546 maternal deaths per 100,000 live births [1]. Unplanned pregnancy and short inter-pregnancy spacing are the leading causes of...
maternal and child death in this region. In developing countries, more than 222 million women's pregnancies are unplanned [2]. The use of modern family planning methods after delivery is considered an important part of interventional efforts [3, 4].

The 2030 Agenda for Sustainable Development Goal (SDGs) includes relevant targets for using contraceptives under the broader goals of health and well-being of the population and gender equality [5, 6]. Family planning service contributes not only to the reduction of morbidity and mortality of mothers and children, but also prevents the risk of unintended pregnancy and its adverse consequence including HIV/AIDS and abortion and hence, it has been used to improve the standard of living [7]. A data from 51 surveys conducted between 2006 and 2013 showed that although 30% of maternal deaths and 10% of child death could be avoided by extending pregnancy [8], 41% of women in SSA who intended to use modern contraceptives were not using them [9]. Moreover, in 2010 only 17% of married women are using contraceptives in SSA which is too low as compared to North Africa (50%), Middle East (39%), East Asia (76%) and Latin America (68%) [10, 11].

A woman’s ability to choose the method of modern contraceptives is affected by her self-image and sense of empowerment. A woman who feels that she is unable to control other aspects of her life may be less likely to feel that she can make decisions about fertility [12]. Independent or joint decision-making with partners on family planning use has a substantial contribution to the improvement of maternal health [13]. Although women’s empowerment is the key to use contraceptives, unfortunately, women's position in all aspects of decision-making, including the use of contraceptives, in developing countries is inferior to their husbands or partners [12, 14].

Women often have less decision-making power due to their political, economic, and sociocultural status and may not be in a position to protect themselves from unwanted sexual intercourse and gender-based violence, which may predispose them to sexually transmitted infections and other sexual and reproductive health (SRH) problems [15].

Women decision-making power has a great impact on health care services utilization including family planning service. Studies conducted in rural Nepal [16], Pakistan [17] and Ghana [18] showed that women’s decision-making power plays an important role in determining uptake of maternal health services. One of the reasons for not using contraceptives is they have no power to decide on the use of these service [19]. Evidences showed that women who have decision-making power are more likely to use contraceptives than those who had not [20, 21]. However, decisions for the use of contraceptives may be affected by unbalanced power relations between women and their partners, especially in more male-controlled societies and where cultural discrimination are practiced [22].

Furthermore, previous studies showed that decision-making power of women to use family planning was associated with education [2, 23–25], age [2, 25–28], knowledge about family planning [26, 29, 30], working status of women [27, 28, 31], gender equality attitude [29], number of living children [23, 27, 28], socio-economic status [24, 25, 31–33], residence [27, 28], husbands desire in terms of number of children [30] and attitude towards family planning [26].

Decision-making power of women to use family planning service is a huge problem in SSA region. However, to the best of our knowledge, there is no study that investigates the factors associated with decision-making power to use family planning among married women in the region. Hence, this study was conducted to fill this gap by identifying the determinants of women decision-making power on the use of family planning service in the region. The finding of this study will be helpful to design appropriate intervention measures that can increase the decision-making power of women to use family planning in the region.

Methods
Data source
This study used the most recent appended demographic and health survey (DHS) datasets of 35 sub-Saharan countries which were conducted from 2009 to 2018. The DHS is a nationally representative survey, collected every 5 years, to provide population and health indicators at the national and regional levels. A pretested standard demographic and health survey questionnaires were used. The questionnaire was contextualized to the different countries context and the data were gathered by trained data collectors. The datasets of each sub-Saharan country were obtained at https://dhsprogram.com/data/dataset_admin/index.cfm. Those countries with no data on decision-making power of women to use family planning were excluded from the analysis. In this study, 83,882 women were included (Table 1).

Variables of the study
Dependent variable
The dependent variable for this study was decision-making power of married women to use family planning service. According to DHS, decision-making power of married women to use family planning was reported in four categories (decision-making by women, partner, joint and others). Hence, we dichotomized this variable
as: yes (if the women decide independently or together with their partner to use family planning) and no (if neither the women decide independently nor jointly with their partner to use family planning) [26].

**Independent variables**

Both individual and community level variables were considered independent variables. The individual level variables were age, level of education, wealth index, occupational status of women and their husbands, media exposure, ANC visit, number of living children, fertility preference of women, husband’s desire in terms of number of children, information related to FP at health facility, residence and SSA region. Countries were categorized in to sub-regions based on socioeconomic and geographical directions [34].

**Data analysis procedure**

We used STATA 14 software to extract, recode and analyze the data. The data were weighted before doing any statistical analysis to restore the representativeness of the sample and to get a reliable estimate and standard error. The whole procedure of weighting and its rationale is found on the guide of DHS statistics [35].

Due to the correlated nature of DHS data, measures of community variation/random-effects such as Median Odds Ratio (MOR), Interclass Correlation Coefficient (ICC), and Proportional Change in Variance (PCV) were calculated. Accordingly, the values of these measures were found out to be significant, and hence the use of multilevel logistic regression model is more appropriate than using ordinary logistic regression. To choose the best fitted model, first we developed four models and compared them with Deviance. These were: the null-model, a model with no independent variable; model I, a model that has individual-level factors only; model II, a model with community-level factors only and model III, a model that contains both community level and independent variables. Model III was selected as the best fitted model as it had the lowest Deviance.

Bivariable and multivariable multilevel logistic regression was performed to determine the associated factors of decision-making power of married women to use FP in SSA. All variables with a $p$ value < 0.25 during bi-variate analysis were entered into the multivariable logistic regression model. In the final model, $p$ value $\leq$ 0.05 was used to declare variables that are statistically significant.

**Results**

**Sociodemographic characteristics of the respondents**

The total weighted sample of 83,882 married women were included in this study. Of these, 22.9% of the respondents were in the age group of 25–29 years and more than half (60%) of them were rural dwellers. More than one-third of both the respondents (39.9%) and their husbands (34.4%) had primary education. The majority of the respondents (73.3%) and their husbands (92.7%) were currently employed. Similarly, the majority of the respondents (67%) had media exposure (Table 2).

**Reproductive characteristics of the respondents**

Of the respondents, 47.6% of them had four or more ANC visits. The majority of the respondents (69.2%) were
told about family planning methods during their facility visits. More than half of the respondents (56%) had fertility preference to have more children. Regarding the use of contraceptive methods, 36.2% of the respondents used injections (Table 3).

**Random effect analysis**
The random-effects model result showed that there is significant clustering of decision-making power of women to use family planning across the communities (OR of community level variance =0.07, 95% CI =0.06–0.10). The value of ICC in the null model revealed that 2.16% of the overall variation of decision-making power of women to use family planning was attributed to cluster variability. The 1.23 MOR value of the null model also indicated the presence of variation in the decision-making power of women to use family planning between clusters. It means if we randomly select women from different clusters, those women at the cluster with higher decision making power of women to use family planning had 1.23 times higher chance of decision-making power to use family planning compared to their counterparts. As you can see in Table 3 below, model III has the lowest Deviance value. Hence, it was selected as the best fitted model (Table 4).

**Factors associated with decision-making power of women to use contraceptives**
The odds of decision-making power to use family planning among married women with age 15–19, 20–24, 25–29 and 30–34 years was decreased by 39%...

| Variable                  | Category        | Weighted frequency | Percent (%) |
|---------------------------|-----------------|--------------------|-------------|
| Age (in years)            | 15–19           | 3215               | 3.8         |
|                           | 20–24           | 13,693             | 16.0        |
|                           | 25–29           | 19,210             | 22.9        |
|                           | 30–34           | 17,890             | 21.0        |
|                           | 35–39           | 15,016             | 17.9        |
|                           | 40–44           | 9794               | 11.9        |
|                           | 45–49           | 5063               | 6.5         |
| Residence                 | Urban           | 33,704             | 40.0        |
|                           | Rural           | 50,177             | 60.0        |
| Region                    | East Africa     | 37,713             | 44.7        |
|                           | West Africa     | 19,471             | 24.0        |
|                           | South Africa    | 15,430             | 18.6        |
|                           | Central Africa  | 10,534             | 12.7        |
| Educational level of respondents | No formal education | 16,714             | 19.9        |
|                           | Primary         | 33,490             | 39.9        |
|                           | Secondary       | 28,100             | 33.5        |
|                           | Higher          | 5578               | 6.7         |
| Education level of husbands | No formal education | 15,251             | 18.2        |
|                           | Primary         | 28,865             | 34.4        |
|                           | Secondary       | 30,280             | 36.0        |
|                           | Higher          | 9406               | 11.0        |
| Respondents’ occupation   | Currently working | 61,454             | 73.3        |
|                           | Currently Not working | 22,428             | 26.7        |
| Husbands occupation       | Currently working | 77,741             | 92.7        |
|                           | Currently Not working | 61,414             | 7.3         |
| Wealth index              | Poorest         | 10,934             | 13          |
|                           | Poorer          | 14,093             | 16.8        |
|                           | Middle          | 16,119             | 19.4        |
|                           | Richer          | 19,309             | 23          |
|                           | Richest         | 23,425             | 27.8        |
| Media exposure            | Yes             | 56,269             | 67.0        |
|                           | No              | 27,585             | 33.0        |
Women who are currently working were 1.27 (AOR = 1.27; CI: 1.20, 1.33) times more likely to have decision-making power to use contraceptive as compared to women who were not currently working. Women who had media exposure were 1.1 (AOR = 1.08; CI: 1.03, 1.13) times more likely to have decision-making power on family planning use as compared to those women who did not have media exposure.

Similarly, the odds of decision-making power on family planning among participants who had 1–3 and ≥ 4 ANC visits were 1.24 (AOR = 1.24; CI: 1.16, 1.32) and 1.31 (AOR = 1.31; CI: 1.22, 1.41) times higher compared to those who did not have formal education.

Table 3  Reproductive characteristics of the respondents in sub-Saharan Africa

| Variables                        | Category | Frequency | Percent (%) |
|----------------------------------|----------|-----------|-------------|
| Number of ANC visits             | 0        | 24,679    | 29.4        |
|                                  | 1–3      | 19,255    | 23          |
|                                  | ≥ 4      | 39,948    | 47.6        |
| Number of living children        | < 3      | 32,908    | 39.2        |
|                                  | 3–5      | 38,515    | 45.9        |
|                                  | > 5      | 12,458    | 14.9        |
| Fertility preference             | Unable to have children | 5100 | 6 |
|                                  | Do not want another children | 31,887 | 38 |
|                                  | Want to have another children | 46,895 | 56 |
| Information about FP at health facility | Yes | 25,844 | 30.8 |
|                                  | No       | 58,037    | 69.2        |
| Husband’s desire in terms of number of children | Same as spouse | 37,187 | 44 |
|                                  | Husband wants more | 39,023 | 46.5 |
|                                  | Husband wants fewer | 7671 | 9.5 |
| Type of contraceptive used       | Pill     | 12,892    | 15.4        |
|                                  | IUD      | 2292      | 2.73        |
|                                  | Injections | 30,380 | 36.2 |
|                                  | Male condom | 7236 | 8.6 |
|                                  | Female sterilization | 4305 | 5 |
|                                  | Periodic abstinence | 6703 | 8 |
|                                  | Withdrawal | 3777 | 4.5 |
|                                  | Implants /Norplant | 12,311 | 14.7 |
|                                  | Lactation amenorrhea (LAM) | 1776 | 2.2 |
|                                  | Other methods (including traditional method) | 2205 | 2.7 |

Table 4  Comparison of models and result of random effect analysis

| Parameters                | Null model | Model I | Model II | Model III |
|---------------------------|------------|---------|----------|-----------|
| Community level variance  | 0.07 (0.06–0.10) | 0.07 (0.06–0.10) | 0.07 (0.05–0.09) | 0.07 (0.05–0.09) |
| ICC                       | 2.16%      | 2.14%   | 2.00%    | 2.02%     |
| MOR                       | 1.29       | 1.29    | 1.28     | 1.28      |
| PCV                       | Ref        | 0.69%   | 7.42%    | 6.60%     |
| Model fitness             |            |         |          |           |
| Deviance                  | 54,592.124 | 53,855.498 | 53,915.178 | 53,310.886 |
visit was increased by 12% (AOR = 1.12; CI: 1.05, 1.20) and 14% (AOR = 1.14; CI: 1.07, 1.21) than those who had no ANC visit, respectively. Besides, the odds of decision-making power on family planning among respondents who were informed about family planning was increased by 9% (AOR = 1.09; CI: 1.04, 1.15) than their counterparts. Women whose husbands desired fewer children had a 14% (AOR = 0.86; CI: 0.79, 0.93) reduced chance of decision-making power for family planning than their counterparts.

Women who had less than 3 and 3–5 children were 1.12 (AOR = 1.12; CI: 1.02, 1.23) and 1.08 (AOR = 1.08; CI: 1.01, 1.16) times higher odds of decision-making power to use FP than women who want to have children (AOR = 0.52; CI: 0.47–0.58). Moreover, the odds of decision-making power to use FP was increased by 1.10 (AOR = 1.10; CI: 1.04, 1.17) times among respondents who do not want other children than those who want to have other children (Table 5).

**Discussion**

The main aim of this study was to determine associated factors of decision-making power to use family planning among married women in sub-Saharan Africa. Accordingly, in this study age, level of education of women, women and their husbands’ occupation, wealth index, region, media exposure, ANC visit, fertility preference of women, husbands’ desire in terms of the number of children and information about family planning were factors associated with decision-making power of women to use family planning.

As this study showed, older women were more likely to decide to use family planning service than the younger ones. This finding is similar to a study conducted in Ethiopia [28], Mozambique [19] and Bangladesh [36]. A possible explanation is that when women get older, they may feel more confident to deal with their husband and to decide on family planning use [37]. On the other hand, young women might not be expected to argue with their older husbands and are required to respect their opinions which may lead to the low decision-making power of younger women to use FP.

The present study revealed that educational status of women was associated with decision-making power of women to use FP. Consistently, other studies also showed that educated women had higher odds of decision-making power to use family planning [2, 27, 37, 38]. Education improves women’s control over their reproductive choices by increasing their position within the family and educated women are more likely to desire smaller families than others and hence have a stronger motivation to practice contraceptives [39].

This study also showed that those women and their husbands who were currently working contribute to decision-making power of women to use FP. This finding is similar with other studies in Malawi [40], Ethiopia [2], Nigeria [41] and South Asia [42]. Women who have occupations may have power and resources, consequently leading to increased independence. Therefore, they do not have to depend on their spouses for resources to make decisions and buy contraceptives. Besides, women whose husbands had occupation may improve the family life generally and this may contribute to women’s decision-making power to use FP indirectly.

Similarly wealth index was positively associated with decision-making power of women. Those women from the richest wealth index had higher chance of decision-making power to use FP than the poorest ones. This finding is in line with other previous studies which explain that women’s economic status impacts their health and decision-making power on contraceptive usage [32, 43, 44]. Women who had more income may have had access and exposure to mass media about contraceptives and hence it increases the likelihood of women’s decision-making power to use it. Furthermore, in this study, media exposure was associated with women’s decision-making power to use FP which is in line with other previous studies [28, 41]. This is due to the fact that mass media helps to increase the decision-making power of women to use contraceptives [29].

In the present study we observed that women who had more children were less likely to have decision-making power on the use of contraceptives as compared to those who had fewer children. This finding seems odd and in contrast with other studies [23, 27]. This might be related to some religions which teach their followers not to use any modern family planning methods. On the other hand, in this study we also found out those women whose husbands had higher desire for more number of children had poor decision-making power to use FP. This finding was similar to a study conducted in Honduras [45] and Ethiopia [30]. This could be related to husbands’ strong influence on women not to use FP, particularly in developing countries [46, 47].

In this study, women who were informed about FP at a health facility had more decision-making power to use FP as compared to their counterparts. This finding is consistent with other studies [46, 48]. The implication of this finding is those women who have information and knowledge about family planning could help them to discuss about the use of contraceptives and influence their husbands. Similarly this study showed that those women who attended ANC visits were more likely to
Table 5  Multilevel regression analysis of decision-making power to use family planning among married women in sub-Saharan Africa

| Variables                          | Decision-making power | Odds Ratio                  |
|-----------------------------------|-----------------------|-----------------------------|
|                                   | Yes, No (%)           | No, No (%)                  | COR(95%CI)       | AOR(95%CI)       |
| Age (years)                       |                       |                             |                 |
| 15–19                             | 2797 (87)             | 418 (13)                    | 0.76 (0.66–0.87) | 0.61 (0.52–0.72)* |
| 20–24                             | 12,167 (88.9)         | 1526 (11.1)                 | 0.91 (0.81–1.00) | 0.69 (0.60–0.79)* |
| 25–29                             | 17,144 (89.3)         | 2066 (10.7)                 | 0.96 (0.87–1.07) | 0.74 (0.66–0.84)* |
| 30–34                             | 16,092 (89.9)         | 1799 (10.1)                 | 1.04 (0.94–1.05) | 0.82 (0.73–0.92)* |
| 35–39                             | 13,506 (89.9)         | 1510 (10.1)                 | 1.06 (0.95–1.17) | 0.89 (0.79–1.00) |
| 40–44                             | 8798 (89.8)           | 996 (10.2)                  | 1.01 (0.91–1.13) | 0.92 (0.82–1.02) |
| 45–49                             | 4527 (89.5)           | 536 (10.6)                  | 1              | 1              |
| Residence                         |                       |                             |                 |
| Urban                             | 30,082 (89.3)         | 3622 (10.7)                 | 1              | 1              |
| Rural                             | 5229 (10.4)           | 44,949 (89.6)               | 1.01 (0.97–1.06) | 1.02 (0.96–1.08) |
| Region                            |                       |                             |                 |
| East Africa                       | 34,861 (92.4)         | 2853 (7.6)                  | 1              | 1              |
| West Africa                       | 17,302 (85.6)         | 2901 (14.4)                 | 0.52 (0.49–0.53) | 0.52 (0.49–0.56)* |
| South Africa                      | 13,895 (90.1)         | 1536 (9.9)                  | 0.76 (0.71–0.81) | 0.76 (0.71–0.82)* |
| Central Africa                    | 8973 (84.2)           | 1561 (14.8)                 | 0.51 (0.48–0.55) | 0.51 (0.47–0.55)* |
| Educational level of respondents  |                       |                             |                 |
| No education                      | 14,423 (86.3)         | 2291 (13.7)                 | 1              | 1              |
| Primary                           | 30,266 (90.4)         | 3224 (9.6)                  | 1.51 (1.42–1.59) | 1.24 (1.16–1.32)* |
| Secondary                         | 25,250 (89.9)         | 2851 (10.1)                 | 1.40 (1.32–1.49) | 1.31 (1.22–1.41)* |
| Higher                            | 5093 (91.3)           | 485 (8.7)                   | 1.66 (1.49–1.85) | 1.36 (1.20–1.53)* |
| Respondents’ occupations          |                       |                             |                 |
| Working                           | 55,489 (90.3)         | 5965 (9.7)                  | 1.35 (1.29–1.42) | 1.27 (1.20–1.33)* |
| Not working                       | 19,542 (87)           | 2886 (13)                   | 1              | 1              |
| Husband’s occupation              |                       |                             |                 |
| Working                           | 69,705 (89.7)         | 8035 (10.3)                 | 1.24 (1.15–1.35) | 1.17 (1.08–1.27)* |
| Not working                       | 53,26 (86.7)          | 816 (13.3)                  | 1              | 1              |
| Wealth index                      |                       |                             |                 |
| Poorest                           | 9656 (88.3)           | 1277 (11.7)                 | 1              | 1              |
| Poorer                            | 1558 (11.1)           | 12,535 (88.9)               | 1.06 (0.98–1.18) | 1.01 (0.93–1.09) |
| Middle                            | 1736 (11)             | 14,383 (89)                 | 1.09 (1.01–1.18) | 1.01 (0.94–1.09) |
| Richer                            | 2071 (10.3)           | 17,239 (89.3)               | 1.12 (1.04–1.20) | 1.02 (0.94–1.11) |
| Richest                           | 2208 (9.4)            | 21,217 (9.6)                | 1.28 (1.19–1.38) | 1.13 (1.03–1.23)* |
| Media exposure                    |                       |                             |                 |
| Yes                               | 50,675 (90.1)         | 5594 (9.9)                  | 1.19 (1.14–1.26) | 1.08 (1.03–1.13)* |
| No                                | 24,335 (88.2)         | 3251 (11.8)                 | 1              | 1              |
| ANC visit                         |                       |                             |                 |
| No ANC visit                      | 21,972 (89)           | 2708 (11)                   | 1              | 1              |
| 1–3 ANC visit                     | 1964 (10.2)           | 17,291 (89.8)               | 1.08 (1.02–1.51) | 1.12 (1.05–1.20)* |
| ≥ 4 ANC visit                     | 4179 (10.5)           | 35,769 (89.5)               | 1.06 (1.01–1.12) | 1.14 (1.07–1.21)* |
| Number of living children         |                       |                             |                 |
| < 3                               | 29,429 (89)           | 3749 (11)                   | 1.06 (0.99–1.13) | 1.12 (1.02–1.23)* |
| 3–5                               | 34,552 (89.7)         | 3964 (10.3)                 | 1.09 (1.02–1.17) | 1.08 (1.01–1.16)* |
| > 5                               | 11,050 (88.7)         | 1408 (11.3)                 | 1              | 1              |
| Fertility preference              |                       |                             |                 |
| Who did not have children         | 4300 (84.3)           | 800 (15.7)                  | 0.68 (0.63–0.74) | 0.52 (0.47–0.58)* |
| Do not want other children        | 29,101 (91.3)         | 2786 (8.7)                  | 1.29 (1.23–1.36) | 1.10 (1.04–1.17)* |
| Want to have other children       | 41,630 (88.8)         | 5265 (11.2)                 | 1              | 1              |
have decision-making power to use family planning. This finding was also consistent with other studies [24, 36]. One explanation is that women go to health facilities for ANC services where they are receiving health information including family planning.

One strength of this study is the use of a representative dataset that includes 35 sub-Saharan countries, making the findings of this study generalizable to the region. The other strength of the study is the use of multilevel modeling, a model that accounts for the nested/hierarchical nature of the demographic and health survey to get reliable estimates. However, the study has also limitations. Because of the secondary nature of the study, there were some ambiguous measurement of variables in the data that we could not correct at this level which remains as amorphous and we can also only determine associations; no causality as it is an observational study. The other limitation of this study is because of we used DHS conducted in different years, it is impossible to accurately compare results.

**Conclusions**

Age, women’s level of education, women and their husbands’ occupation, wealth index, media exposure, ANC visit, fertility preference, husband’s desire for more number of children, region and information about family planning were factors associated with decision-making power to use family planning among married women. Behavior change interventions including health education and promotion in this region should target young married women, women who are not educated, women who are not currently working and whose husbands’ desire to have is more number of children thereby to improve the decision-making power of women to use family planning.

**Abbreviations**

ANC: Antenatal Care; DHS: Demographic and Health Surveys; FP: Family Planning; MMR: Maternal Mortality Ratio; SRH: Sexual Reproductive Health; SSA: Sub-Saharan Africa; WHO: World Health Organization.

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**Authors’ contributions**

GDD and YY designed the study, analyzed the data and drafted the manuscript. YA, WA and AAG were involved in the analysis of the data and critically reviewed the article. All authors read and approved the final manuscript.

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**Availability of data and materials**

All the data related to the study were included in the manuscript. The DHS datasets analyzed for this study are available in the DHS repository with its website upon reasonable request. (https://dhsprogram.com/data/dataset_admin/index.cfm).

**Declarations**

**Ethics approval and consent to participate**

Since we used a secondary DHS data, obtaining ethical approval was not needed. However, we have received a permission letter to download and use the data files from DHS Program. The protocol was performed in accordance with the relevant guidelines and regulations.

**Consent for publication**

Not applicable.

**Competing interests**

All the authors declare that they have no competing interests.

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**References**

1. WHO. Trends in Maternal Mortality:1990–2015, Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division. Geneva: World Health Organization, 2015a.

### Table 5 (continued)

| Variables                                      | Decision-making power | Odds Ratio |
|------------------------------------------------|-----------------------|------------|
|                                                | Yes, No (%)           | No, No (%) | COR (95% CI) | AOR (95% CI) |
| Women who are told FP at health facility       |                       |            |
| Yes                                            | 23,291 (90.1)         | 2553 (9.9) | 1.13 (1.08–1.19) | 1.09 (1.04–1.15)* |
| No                                             | 51,739 (89.2)         | 6298 (10.8) | 1          | 1            |
| Husbands’ desire in terms of number of children |                       |            |
| The same with spouse                           | 33,656 (90.5)         | 3531 (9.5) | 1.22 (1.17–1.28) | 0.99 (0.94–1.04) |
| Husbands who wants more                        | 34,518 (88.5)         | 4505 (11.5) | 1          | 1            |
| Husbands who wants fewer                       | 6856 (89.4)           | 815 (10.6)  | 1.07 (0.98–1.16) | 0.86 (0.79–0.93)* |

*P-value ≤ 0.05
2. Belay A, Mengesha Z, Woldegebriel M, Gelaw Y. Married women's decision making power on family planning use and associated factors in Mizan-Aman, South Ethiopia a cross sectional study. BMC Womens Health. 2016;16(1):12.
3. Singh S, Sedghi G, Hussain R. Unintended pregnancy: worldwide levels, trends, and outcomes. Stud Fam Plan. 2010;41:241–50.
4. Hubacher D, Mavranzouli I, McGinn E. Unintended pregnancy in sub-Saharan Africa: magnitude of the problem and potential role of contraceptive implants to alleviate it. Contraception. 2008;78:73–8.
5. United Nations General Assembly. Transforming our world: the 2030 Agenda for Sustainable Development: General Assembly Resolution 70/1. 2015.
6. United Nations (2017a). The sustainable development goals report. New York: United Nations. 2017.
7. World Health Organization (WHO). Department of health and human services. Office of Population Affairs. 2010,2010.
8. Rustein SO. “Effects of preceding birth intervals on neonatal, infant and under-five years mortality and nutritional status in developing countries: evidence from the demographic and health surveys,” Int J Gynecol Obstet. 2005;89. pp. 57–524.
9. Sedghi G, Hussain R. Reasons for contraceptive nonuse among women having unmet need for contraception in developing countries. Stud Fam Plan. 2014;45(2):151–69.
10. Ahman E, Shah I. Unsafe abortion: global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008. J Obstet Gynaecol Can. 2011;33(12):1140–58.
11. Brenner J, Frost A, Haub C, Matther M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
12. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
13. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
14. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
15. International Labour Organization. Global Employment Trends for Women. 2009-43.
16. Kamala L. Women’s autonomy and utilization of maternal health care services in rural Nepal. Nepal Population Journal. 2018;18(17).
17. Xiaohei H, Ning M. The effect of women’s decision-making power on maternal health services uptake: evidence from Pakistan. Health Policy Plan. 2013;28:176–84.
18. Edward K, Augustine T, Kwaku K, Mather M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
19. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
20. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
21. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
22. International Labour Organization. Global Employment Trends for Women. 2009-43.
23. Kamala L. Women’s autonomy and utilization of maternal health care services in rural Nepal. Nepal Population Journal. 2018;18(17).
24. Xiaohei H, Ning M. The effect of women’s decision-making power on maternal health services uptake: evidence from Pakistan. Health Policy Plan. 2013;28:176–84.
25. Edward K, Augustine T, Kwaku K, Mather M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
26. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
27. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
28. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
29. International Labour Organization. Global Employment Trends for Women. 2009-43.
30. Kamala L. Women’s autonomy and utilization of maternal health care services in rural Nepal. Nepal Population Journal. 2018;18(17).
31. Xiaohei H, Ning M. The effect of women’s decision-making power on maternal health services uptake: evidence from Pakistan. Health Policy Plan. 2013;28:176–84.
32. Edward K, Augustine T, Kwaku K, Mather M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
33. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
34. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
35. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
36. International Labour Organization. Global Employment Trends for Women. 2009-43.
37. Kamala L. Women’s autonomy and utilization of maternal health care services in rural Nepal. Nepal Population Journal. 2018;18(17).
38. Xiaohei H, Ning M. The effect of women’s decision-making power on maternal health services uptake: evidence from Pakistan. Health Policy Plan. 2013;28:176–84.
39. Edward K, Augustine T, Kwaku K, Mather M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
40. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
41. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
42. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
43. International Labour Organization. Global Employment Trends for Women. 2009-43.
44. Kamala L. Women’s autonomy and utilization of maternal health care services in rural Nepal. Nepal Population Journal. 2018;18(17).
45. Xiaohei H, Ning M. The effect of women’s decision-making power on maternal health services uptake: evidence from Pakistan. Health Policy Plan. 2013;28:176–84.
46. Edward K, Augustine T, Kwaku K, Mather M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
47. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
48. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
49. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
50. International Labour Organization. Global Employment Trends for Women. 2009-43.
51. Kamala L. Women’s autonomy and utilization of maternal health care services in rural Nepal. Nepal Population Journal. 2018;18(17).
52. Xiaohei H, Ning M. The effect of women’s decision-making power on maternal health services uptake: evidence from Pakistan. Health Policy Plan. 2013;28:176–84.
53. Edward K, Augustine T, Kwaku K, Mather M, Ringheim K, Zuehlke E. World population highlights: key findings from PRB’s 2010 world population data sheet. Popul Bull. 2010;65(2):1–12.
54. Do M, Kuri moto N. Women’s empowerment and choice of contraceptive methods in selected African countries. Int. Perspect Sex Reprod Health. 2012;33–33.
55. Wado Y. Women’s autonomy and reproductive healthcare-seeking behavior in Ethiopia. Calverton: ICF International; 2013.
56. Bourey C, Stephenson R, Bartel D, Rubardt M. Pile sorting innovations: exploring gender norms, power and equity in sub-Saharan Africa. Global public health. 2012;7(2):995–1008.
57. International Labour Organization. Global Employment Trends for Women. 2009-43.