

The role of empowerment in the use of modern contraceptives among women in need of family planning in Burkina Faso: A multilevel analysis

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Research

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Abstract

Background In Burkina Faso, women still have difficulty satisfying their family planning demand because of the patriarchal and gender-unequal society. Despite evidence that women's empowerment can help, few studies have measured its impact at both community and household levels. Taking into account these two parameters, we looked into the association between women's empowerment and modern contraception use among Married Women of Reproductive Age (MWRA) with no desire for having children in Burkina Faso. Methods Using the 2010 Demographic and Health Survey (DHS), we analyzed data from 4714 MWRA with family planning needs from 573 communities. Indicators of gender equality at the community level were composed of aggregated variables for each primary sampling unit, and domains of women's agency in households matters were derived with principal component analysis. A multilevel logistic regression model was used to gauge the effects of empowerment on modern contraceptives use adjusted for household socioeconomic status and demographics of women. Results Among MWRA, 30.8% satisfied their demand for family planning using modern methods. At the community level, higher women's assets ownership (aOR 1.26, CI 1.04 - 1.54), secondary education (aOR 1.45, OR 1.08 - 1.64), and exposure to family planning messages (aOR 1.33, CI 1.08 - 1.64) were associated with more modern contraceptive use; higher ideal number of children was negatively associated (aOR 0.76, CI 0.61 - 0.95). Unexpectedly, higher community prevalence of female genital mutilation was positively associated with contraceptive use (aOR 1.25, CI 1.03-1.52). Women's agency in household matters, including opposing domestic violence, involved with decisions and enjoying freedom in seeking healthcare were positively associated with use, but only the last domain remained significant in multilevel analysis (aOR 1.29, CI 1.08 - 1.54). Living in richer household, being older, and having secondary education level were also positively associated with modern contraceptive use. Conclusion Gender equality at the community level and women's situation in the household constitute the context in which women's demand for family planning is determined. Therefore, promoting gender equality and ensuring women's entitlement to make life choices have the potential to increase modern contraceptive coverage along with improved life conditions.

Background

Around 125 million African women of reproductive age wanted to avoid unwanted pregnancies in 2017; however, around 47% of these women either only used traditional methods or didn't use any contraceptive methods at all [1]. Considered to have an unmet need for modern contraception, these women accounted for 90% of all unintended pregnancies in Africa [2]. The proportion of African women with unmet need for modern contraception remains high, particularly in West Africa region where it was estimated at 25.4% in 2010, twice more than that of the global level [3]. Meanwhile, demand for family planning satisfied using modern contraceptive which represents modern contraceptive coverage among those in-need was the lowest (33%) in West and Central Africa among married women of reproductive age (MWRA), compared with other least developed regions (53%) [4]. In Burkina Faso, a West African country, this proportion grew from 20% in 1990 to 36% in 2010, but is still far from the Sustainable Development Goals (SDGs)

benchmark of at least 75% by 2030 [3, 5]. Consequently, women in Burkina Faso disproportionately suffer from inability to use modern contraceptives to prevent unintended pregnancies.

In many African countries, poor socioeconomic development, social barriers, and weak family planning programs often limit women's ability to access modern contraceptives. For instance, in Burkina Faso, the major reasons for not using family planning (FP) methods included lack of access and lack of knowledge, partners' opposition to the practice, and health concerns about contraceptive methods [6]. Over the past decade, the Millennium Development Goals (MDGs) made significant progress to reduce poverty and expand the use of contraceptives. Yet from 1990 to 2015 in West Africa, the amount of unmet needs for family planning persistently exceeded contraceptive prevalence [3, 7]. Therefore, removing social barriers that limit women's contraceptive use could help maintain progress made during the MDG-era and make greater achievement under the SDGs. Therefore, it is crucial to better understand gender-based norms and how women's empowerment influences women's contraceptive behavior.

Gender norms, women's empowerment and contraceptive use

According to the United Nations, gender norms are social institutions that define masculinity and femininity based on sex and ascribe to male and female roles, relationships and behaviors deemed to be appropriate [8]. In patriarchy, the social system is governed by gender rules in which the male as breadwinner is not only the predominant owner of resources but also the primary holder of decision-making power relative to the female housekeeper [9]. As a result, this social construction of roles and identities guide sex attitudes, behaviors, and values which inexorably lead to gender inequality and imbalance power dynamic in households. The promotion of gender equality and the empowerment of women are therefore a necessary step for women to gain control over their sexuality and reproduction rights. In fact, gender equality refers to both male's and female's equal access to resources, opportunities, rights and protections [10]. As for empowerment, it is a process that expands one's ability to make choices and act upon them against prevailing social norms; it involves access to resources and the exercise of agency to transform choices into desired goals [11]. Agency is a central part of empowerment and is exercised across multiple dimensions of life. Research shows that different domains of women's agency are positively associated with contraceptive use, but depending on each setting and domain as well as contraceptive measure [12, 13]. Empowering women remains key to preventing unintended pregnancies in SSA, yet community level interventions and direct contraceptive provision rarely translate into downstream modern contraceptive prevalence [14].

Research suggests that gender norms may influence women's ability to use contraceptives through increase in gender equity and women's empowerment [15]. However, a critical research gap exists on conceptualizing empowerment at different levels and domains, especially Africa [16, 17]. To our knowledge, only two studies in SSA setting adopted a comprehensive approach to examine the link between multiple domains of women's empowerment and contraceptive use at country, community and household levels. The first study found, across 32 SSA countries, positive association between women's empowerment and contraceptive use in countries with greater development indices, neighborhoods with

greater socioeconomic position for women, and households with equitable gender norms [18]. The second showed in urban Nigeria that increased participation in household matters was individually and collectively associated with modern contraceptive adoption and consistent use [19]. Yet, none of these recent studies drew on current SDGs framework set by the global community for universal access to sexual and reproductive health and reproductive rights [20]. More specifically, two aspects in the SDGs are relevant to family planning. The first aspect, which is an SDG indicator (3.7.1) for monitoring family planning outcome, represents the proportion of women who have their need for family planning satisfied by modern methods. It represents from gender perspective the extent to which women who need family planning are covered by using modern methods. The second outlined pathways to achieve gender equality and women's empowerment by ending discrimination and violence and by promoting access to rights and opportunities. Accounting for SDGs indicators would then facilitate track progress and help design more effective family planning programs that integrate gender equality and women's empowerment. Furthermore, none of the previous studies used rigorous methods to identify domains of agency prior to their analysis. Using exploratory and confirmatory analyses, Yount et al. found that women may exercise agency in family decisions, freedom of movement, and attitudes about violence against wives domains [21]. Yet, it remains unclear which domains and which levels of empowerment are relevant to modern contraceptive coverage in a specific setting. In this study, we assessed women's inability to use modern contraceptive methods and its link with women's empowerment indicators in households and communities in a West African setting.

Conceptual framework

In our conceptual framework, we adapted Kabeer's framework of empowerment to consider access to resources and agency as explanatory variables that enable the use of modern contraceptives among women in-need [11]. Access to resources refers to the targets set in goal 5 of the 2030 Development Agenda to achieve gender equality and empower all women and girls [20]. These targets include ending discrimination and violence against all women and girls and promoting their rights and opportunities. Indicators of these targets measured the levels of domestic violence, early marriage, female genital mutilation, unpaid employment, and those of assets ownership, education, number of children, exposure to FP messages, and access to FP health worker. Women's agency reflects on women's involvement in different domains of household matters including family decisions and freedom of movement and attitudes toward domestic violence [21].

Furthermore, we adjusted for socioeconomic and demographic factors known to be related with contraceptive use [16]. Therefore, we argued that gender equitable norms in communities and households would increase modern contraceptive prevalence among in-need women. More specifically, lower discrimination and violence, greater rights and opportunities in communities as well as participation in family decisions, freedom of movement and opposition to domestic violence in households would enable women to use modern contraceptives. The conceptual framework is illustrated by the diagram in Figure 1.

Data Collection And Methods

Context

Burkina Faso is a predominantly rural country of estimated 20 million inhabitants in 2020 with a 3.1% population growth rate per year [22]. It is a primarily patriarchal country in which women's childbearing roles and subordinate conditions are part of the social fabric [23]. In 2018, Burkina Faso was among countries with the lowest human development index and the highest gender inequality index in West Africa [24].

Data source

The data for this study came from the individual women file of the 2010 Burkina Faso Demographic and Health Survey (DHS) [25]. This is the most recent nationally-representative and complete household-based data collected on family planning, women's empowerment, and household characteristics.

The DHS used a stratified two-stage cluster design. At the first stage, 574 Enumeration Areas (EA) were selected using the Probability Proportional to Size (PPS) sampling method based on the 2006 population census. However, one EA located in the Sahel region was not surveyed. At the second stage, a total of 14,424 households were selected using systematic random sampling based on a list of households in each EA. Within each selected household, all eligible women aged 15-49 years were interviewed. In sum, data from 573 out of 574 clusters, 14242 out of 14536 households, and 17087 out of 17363 women were produced resulting in response rates of 99.8%, 99.2% and 98.4% at cluster, household and individual levels.

Population

Our focus was on MWRA at risk of pregnancy (fecund) and who desired to limit or delay fertility by at least 2 years. We also included pregnant and postpartum amenorrhoeic women who mistimed, unplanned or did not want their current pregnancy or recent childbirth. After removal of missing values, the final unweighted study population size was 4714 MWRA, living in 573 communities, and in need of FP (Figure 2).

Outcome and exploratory variables

In the DHS recode manual, modern contraceptive methods are female and male sterilization, contraceptive pills, intrauterine contraceptive devices, injectables, implants, female and male condoms, diaphragm, contraceptive foam and jelly, lactational amenorrhea method, standard days method, two-day method, emergency contraception, cervical cap, and contraceptive sponge [25]. The respondents were asked two questions. First, "Are you currently doing something or using any method to delay or avoid getting pregnant?" If the answer was yes then we would follow up with the second question: "Which method are you using?" We coded "1" when women were using any modern contraception methods and "0" if otherwise.

Our main exposure variable is women's empowerment measured at both community and household levels. In this study, community-level indicators were aggregated data computed for each EA using data of all women in that EA. Norms that favored violence and discrimination against women were measured by the proportions of acceptance of domestic violence, early marriage (before 18 years old), female genital mutilation, and unpaid employment. Meanwhile, norms that promote women's rights and opportunities were measured by the proportions of women's assets ownership, exposure to family planning messages, access to family planning health workers, years of education, and ideal number of children. Women's agency in their households was represented by three variables: women's attitudes toward domestic violence, participation in decision making, and freedom in seeking medical services. The three variables were constructed based on twelve questions. The categorization and codification are shown in Table 1.

Household socioeconomic characteristics (wealth and residence in rural or urban areas), and women's sociodemographic factors (age and education) were used as control variables.

Reliability of women's agency

The responses to the 12 questions in Table 1 were examined for internal consistency by Principal Components Analysis (PCA) and Cronbach's alpha. Since PCA is sensitive to relative scaling, we then used original categorization from the survey and identified three constructs of women's agency using 0.300 as the cut-off value [26]. After that, Cronbach's alpha was applied scaled responses to assess their inter-item reliability for each specific construct; we used 0.65 as a minimum reliability cut-point [27]. The scaling was used to differentiate "empowered" from "not empowered" women. For instance, women who did not justify wife beating, those who had a say in household decisions, and those who did not find problem in getting medical help were considered as empowered. Finally, drawing from previous studies, summative scales were constructed to reflect greater women's agency in a specific domain [28]. For attitudes toward domestic violence, a woman was given a score of 1 if she responded with 'no' to all five DHS questions (greater agency) and 0 if she responded 'yes' (subordination) to any question.

Involvement in household decision-making was based on women's say in family visits, own health care, or household purchases. A score of 1 was given if she 'solely or jointly with the husband' participated (greater agency) and 0 if 'husband alone, someone else or other' made the decision (exclusion). In freedom of movement to seek healthcare, we based our analysis on constraints to access healthcare and coded 1 if a women faced no constraint (autonomy) and 0 if she faced constraint (dependency) in each of the following situations: permission to go, money needed for treatment, distance to the health facility, or not wanting to go alone (Table 1).

Data analyses

We performed descriptive and bivariate analyses and fitted multilevel logistic regression models adjusted for weights accounting for cluster-effect and non-response. All analyses were conducted using Stata version 14 [29].

Firstly, we described frequencies and probability distributions of community-level indicators of gender equality, women's agency, as well as household socioeconomic status and women's sociodemographic characteristics. For community indicators, values higher or lower than national means were regarded as "high" or "low". Then, we assessed the relationship between these independent variables and modern contraceptive prevalence using Chi square. Prior to the regression analysis, we ensured that there was no multicollinearity using a less than five (< 5) Variance Inflation Factor (VIF) as a threshold. In the multilevel logistic regression analysis, the null model showed an Intra-Cluster Correlation (ICC) of 20%. Three models were built to estimate predictors of modern contraception use. Model 1 analyzed the effect of women's agency domains on contraceptive use. Model 2 added community indicators of gender equality, including those reflecting violence and discrimination against women and promotion and women's rights and opportunities. Model 3 further added household socioeconomic status and women's sociodemographic factors.

Ethical considerations

The proposed analysis was exempt as described in the enforcement rules issued by the Institutional Review Board of National Yang-Ming University.

Results

Sample characteristics

We found that among the 4714 women of reproduction with need for family planning, 66.9% were using no contraceptive methods at all, while 2.4% were using traditional methods. Among modern contraceptives users (30.7%), 10.1% and 20.6% were using short-term and long-term modern methods respectively. No use of permanent modern contraceptive methods was reported.

Domains of women's agency

Principal Component Analysis identified three domains of women's agency within the household setting: attitudes toward domestic violence, participation in household decisions, and freedom in seeking healthcare items (Table 2). Cronbach's alpha testing found that the coefficients for the three domains were 0.83, 0.65, and 0.69 respectively. Summative scales were built for each domain; higher scores reflected greater ability to oppose domestic violence, participate in household decisions, or seek healthcare.

Bivariate analysis

All three components of women's agency were significantly associated with modern contraceptive use in bivariate analysis (Table 3). Women who were strongly opposed to domestic violence, those who

participated in household decisions, and those free in seeking healthcare had higher prevalence of modern contraceptive use.

We then examined whether indicators of gender equality at the community level were associated with modern contraceptives use. Two categories of indicators were examined: violence and discrimination against women, and promotion of women's rights and opportunities. All indicators of violence and discrimination against women were negatively and significantly associated with modern contraceptive use except genital mutilation, which was marginally significant. With regard to indicators of promotion of women's rights, positive association with modern contraceptive use was found in community prevalence of secondary education and exposure to FP messages.

At the household and individual levels, women who lived in rich households or in urban areas had higher levels of modern contraceptive use. Women in the higher age groups and those with higher education levels had also higher prevalence of modern contraceptive use.

Regressions analysis

Model 1 in the multilevel regression analysis included the three domains of women's agency, each showing significant positive association with contraceptive use (Table 4). Community-level indicators of gender equality were added in model 2. Female genital mutilation, ideal number of children, secondary education for women, and exposure to FP messages were significantly associated with contraceptive use, with some attenuation in the risk estimates for women's agency domains. Model 3 included demographic factors, which further attenuated the risk estimates for women's agency, with marginal significance for two of the three domains. The estimates for community-level indicators of gender equality remained essentially the same, with living in higher community-level of assets ownership becoming significant.

Measures of variations in the null model show a substantial variation in contraceptive use across the 573 communities ($\sigma^2 = 0.82$, 95% CI 0.64 to 1.05), and 20% of the variation in contraceptive use was explained by community level indicators. Using log likelihood test to assess the model-fitting, model 2 showed a significant improvement in fit over Model 1 [$\chi^2(9) = 149.82$; $p < 0.001$], and model 3 over model 2: [$\chi^2(7) = 101.80$; $p < 0.001$]. The Proportions of Variance Change (PVC) measured the levels of variance in the communities explained by the introduction of exploratory variables. They were 14%, 55% and 60% in models 1, 2, and 3; respectively.

Discussion

Only 30.7% of married women of reproductive age in need of contraception were able to use modern methods to prevent or delay unintended pregnancy in Burkina Faso. We analyzed women's empowerment at two levels: women's agency within the household setting, and gender equality at the community level. Both were found to be significantly associated with modern contraceptive use. More specifically, at

community-level, women's rights and opportunities were positively associated with the use of modern methods of contraception while violence and discrimination against women had the opposite effect, with the exception of female genital mutilation. The association was mostly maintained after adjustment for socioeconomic and demographic variables.

Entitlements to make life choices

In this study, each domain of women's agency was positively related to modern contraceptive use. Similarly, a review found positive relationship with contraceptive use in studies that measured agency as separate domains of decision-making and freedom of movement [12]. Additionally, Bongale et al. found that having gender equitable attitudes was a significant determinant of decision-making power related to women's use of modern contraceptive methods [30]. In patriarchal societies, men are responsible for fertility decisions as they assume the position of household heads; conversely, women are assigned child care and household chores. This traditional division of labor and spousal power imbalance indicates the importance of women's participation in household decisions [31]. Okigbo et al. found that changes in gender norms toward equitable attitudes and household decision-making participation increased women's modern contraceptive use in urban Nigeria [19]. However, the relationship between domains of agency and modern contraceptive use is not consistent, and may depend on other factors such as living conditions and the effectiveness of family programs. For instance, within domains of empowerment and modern contraceptive use, Do et al. found no relationship with attitudes toward domestic violence and freedom of movement in Zambia, Ghana, Namibia and Uganda [13]. However, for decision-making power, no relationship was found in Zambia and Ghana, but Namibia and Uganda. Besides, Bogale et al. found a positive relationship between decision-making power and contraceptive use among rural women but no relationship among urban women [30]. These inconsistencies and mixed results may also stem from discrepancies in the measurement of agency domains, the use of reference category, the study settings, and women's socioeconomic status [12].

In the present study, we tried to display the importance of women's agency by multilevel analyses taking into account both the community norms (as represented by community indicators of gender equality) and socioeconomic status. We found that the persistence of positive relationships among women, particularly their ability to freely seek healthcare, may have revealed a critical domain of agency for contraceptive use in the Burkina Faso setting. A previous study found that married women in Burkina Faso used various bargaining strategies to achieve their objective when seeking healthcare [32]. This domain has the most direct relationship with women's ability to seek help with regard to family planning.

Gender norms at the community-level

Consistent with the socioecological framework, we found that gender equality norms at community-level shape modern contraceptive use [33]. Although the DHS did not directly measure norms on gender equality, in this study we used aggregated data of women's status in each sampling area as indicators. Specifically, higher levels of women's rights and opportunities increased modern contraceptive use, while higher levels of violence and discrimination had the opposite effects. These findings are supported by

previous evidence that traditional gender norms that support higher ideal number of children, early marriage, domestic violence or female unemployment reduced women's ability to meet their family planning needs [34-36]. Also, promoting women's education, autonomy, HIV knowledge, and contact with family planning health workers were shown to increase modern contraceptive use among women [34, 35, 37]. In patriarchal societies, violence and discrimination are used to maintain women in a socially disadvantaged position and legitimize their subordinate position [38]. Prevailing fertility norms set women's role as mothers and wives by valuing early marriage and high fertility while overlooking their socioeconomic independence [39]. In contrast, the promotion of women's access to means of production, human capital and family planning knowledge contributed to challenging high fertility preferences through life choices. One unexpected finding was that the prevalence of female genital mutilation was associated with higher likelihood of modern contraceptive use. The possibility of ecological fallacy was ruled out by including individual data on genital mutilation in the model (not shown). One study suggested that in communities with more mutilated women, negative obstetrical consequences of high fertility may be more appreciated [40].

Previous studies have found that at the country-level, greater socioeconomic opportunities for women were associated with increased uptake of modern contraceptive use [3, 18, 41]. This study demonstrated that within a specific country, this relationship holds true even after adjusting for individual socioeconomic variables. This finding indicates the importance of creating a gender-equal environment in the community.

Demographic factors

We found that the probability of modern contraceptive use increases with women's higher socioeconomic position. Education and economic position were known to be key factors of contraceptive use in Sub-Saharan Africa [16]. These variables may be associated with greater access to and acceptability of modern contraceptives. Besides, previous research in Burkina Faso showed that greater socioeconomic position contribute to participation in household decisions which may include modern contraceptive use [42]. In fact, we found that household wealth, urban residency, and women's education were significantly and positively associated with opposition to domestic violence, influence on household decisions, and freedom in seeking healthcare (Data not shown). However, by comparing the models in Table 4, it is suggested that women's agency played some additional roles that are independent from women's individual factors, although two of the three domains showed only marginal significance. To fully appreciate the relationship between household income, women's education, and women's agency in family planning, we need information from the male counterpart in decision making, as well as narratives from female participants.

This study used a grounded conceptual framework, systematic analytical strategy, and rigorous statistical methods to assess modern contraceptive use and its link with women's empowerment. Nonetheless, we acknowledge several limitations. Due to data limitation on the family planning service environment, we were unable to assess the role of the quality and delivery of health services. Likewise,

the DHS questionnaire on women's empowerment was based on a conceptual framework developed from experience in Asia rather than Africa [43]. Some restrictions found to women's empowerment may not be relevant to our context. Therefore, qualitative research is needed to understand context surrounding domains of empowerment for the sake to identify appropriate indicators and get accurate measures. Nevertheless, our analytical strategy using principal components analysis and Cronbach's alpha was able to identify with satisfactory consistency three domains of women's agency that are similar to previous validated models for women's agency [21]. Another major limitation is the cross-sectional nature of the study design that prevented us from making any causality inference on the relation between women's empowerment and modern contraceptives use. Lastly, the use of aggregated data to measure community-level indicators of empowerment may have biased our results, as the concept of community goes beyond geographical boundaries of enumeration areas [44].

This study has strengths as it outlined the role of community-level gender equality and women's agency in households in modern contraceptive use in Burkina Faso. First, we not only conceptualized empowerment at individual and community levels, but we also distinguished domains and indicators at both levels. Doing so would facilitate the design of interventions targeting specific levels of action and populations of interest. Unlike previous studies, we focused on modern contraceptive use among women with no childbearing desire. This indicator is of great significance as it tracks progress toward universal access to sexual and reproductive health and reproductive rights [45, 46]. Since 2012, Burkina Faso is committed to increasing modern contraceptive uptake among women and girls. The results of this study would help better understand gender norms influences on modern contraceptive coverage which could result in the integration of change in gender norms in communities and households to achieve long-term family planning effectiveness together with sexual and reproductive rights.

Conclusion

In the patriarchal social system, structural inequality and household subordinate position limit women's empowerment to participate in life choices, including modern contraceptive use. Therefore, promoting gender equality in communities and ensuring the exercise of agency in household matters could contribute to enable women to satisfy their demand for family planning using modern methods. In order to achieve the SDGs' target of universal access to sexual and reproductive health services, substantial effort should be directed toward gender-equitable norms and relationships in all spheres of life, including communities and homes. Meanwhile, financial and technical resources are needed to increase family planning access and acceptability, involve male partners and seek community support for the fulfillment of reproductive rights.

Abbreviations

MWRA

Married Women of Reproductive Age

DHS

Demographic and Health Survey

SDGs

Sustainable Development Goals

MDGs

Millennium Development Goals

FP

Family Planning

PCA

Principal Components Analysis

ICC

Intra-Cluster Correlation

PVC

Proportions of Variance Change

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

The data supporting the findings of this research are publicly available from the DHS Program in
<https://dhsprogram.com/>

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

SYMS contributed to the selection of the study hypotheses, questions, data analysis and the drafting of the first report

SYMS, CP and SLH contributed to the interpretation of data, the revision of the report and the approval of the final version. All authors were involved in the writing of the paper, and they all approved the final

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Tables

Table 1: Constructs of women's agency derived from 12 DHS responses

Constructs	DHS questions	Original categorization from	Scaled responses
		the DHS used in the PCA	used after PCA
Attitudes toward domestic violence	Is a husband justified in hitting/beating his wife in the following situations? (5 responses ^{a)}	1 = yes 0 = no 8 = don't know	1 = no 0 = yes & don't know
Involvement in decision-making	Who usually has the final say in the family in the following decisions? (3 responses ^{b)}	1 = respondent alone 2 = jointly 4 = partner alone 5 = someone else 6 = other	1 = jointly or alone 0 = partner alone; someone else and other
Freedom in seeking medical services	When you are sick and want to get medical advice or treatment, is each of the following a big problem or not? (4 responses ^{c)}	1= big problem 2 = not a big problem 0 = big problem	1= not a big problem

a If she goes out without telling him, neglects the children, argues with him, refuses sex, or burns food.

b Decisions on family visits, own health care, or household purchases

c In case of getting: permission to go, money needed for treatment, distance to the health facility, or not wanting to go alone

Table 2: Factor loading of women's agency domains in Principal Component Analysis (PCA) before varimax rotation

Reliability		Factors loadings		
Women's agency		Gender equitable attitudes	Influence on decisions	Freedom in seeking healthcare
Attitudes toward domestic violence				
Goes out without telling him		0.4440	-0.0881	-0.0951
Neglects the children		0.4536	-0.0946	-0.1087
Argues with him		0.4552	-0.0581	-0.1306
Refuses sex		0.4087	-0.0345	-0.1354
Burns food		0.3701	-0.0859	-0.0664
Participate in household decisions				
Family visits		0.1586	0.6136	0.1564
Own health care		0.1500	0.5701	0.2019
Household purchases		0.0980	0.3495	0.2463
Problems in getting medical help when sick:				
Needs permission to go		0.0799	-0.2277	0.4930
Needs money for treatment		0.0667	-0.0601	0.3568
Prohibited by distance to health facility		0.0973	-0.2318	0.4412
Not willing to go alone		0.913	-0.1962	0.4984
Eigen values		3.1	1.7	2.2
Variance explained (%)		25.7	18.5	14.0

Table 3: Modern contraceptive prevalence in relation to women's agency, gender equality in communities, and demographic characteristics

Characteristics	N	%	Use (%)	P-value
Women's agency	N (4714)			
Opposition to domestic violence	0.0001			
No: Justification in some occasions (0-4)	2040	43.9	26.0	
Yes: Allows no justification (5)	2674	56.1	34.4	
Participation in household decisions	0.0001			
No: No participation (0)	1903	39.1	26.5	
Yes: Some or full participation (1-3)	2811	60.9	33.5	
Freedom in seeking healthcare	0.0001			
No: Problems in some situation(s) (0-3)	3639	77.7	27.8	
Yes: No problem (4)	1075	22.3	41.0	
Community-level indicators of gender equality	N (573)	% & means		
<i>Violence and discrimination against women</i>				
Acceptance of domestic violence		43.2		0.0001
Low	289	50.4	35.6	
High	284	49.6	25.7	
Early marriage		46.9		0.0001
Low	298	52.0	37.8	
High	275	48.0	23.8	
Genital mutilation		76.2		0.0532
Low	228	39.8	33.1	
High	345	60.2	29.0	
Unpaid work		35.9		0.0001
Low	331	57.8	34.7	
High	242	42.2	25.4	
Ideal number of children		5.5		0.0001
Low	291	50.8	38.7	
High	282	49.2	21.8	
<i>Promotion of women's rights and opportunities</i>				
Assets ownership		39.5		0.0784
Low	301	52.5	32.4	
High	272	47.5	28.9	
Secondary education		12.4		0.0001
Low	386	67.4	23.2	
High	187	32.6	47.1	
Exposure to FP messages		60.1		0.0001
Low	269	47.0	22.8	
High	304	53.0	39.2	
Contact with FP health worker		29.6		0.2058
Low	322	56.2	31.8	

High	251	43.8	29.3
Demographic characteristics			
Household wealth			0.0001
Poor	1516	33.9	19.2
Middle	906	19.0	21.8
Rich	2292	47.1	42.7
Household residential area			0.0001
Urban	1522	27.3	48.2
Rural	3192	72.7	24.2
Women's age			0.0471
15-24	1162	25.0	27.5
25-39	1900	40.7	32.0
40-49	1652	34.3	31.6
Women's education level			0.0001
No education	3596	76.7	25.3
Primary	674	13.7	40.5
Secondary & Higher	444	9.6	60.4

Table 4: Multilevel logistic modelling of empowerment, demographic factors and modern contraceptive use among women in-need

Regressions		Model 1		Model 2		Model 3	
		aOR	95%CI	aOR	95%CI	aOR	95%CI
Women's agency							
<i>Opposition to domestic violence (No)</i>							
Yes	1.36***	[1.16-1.60]	1.25*	[1.06-1.47]	1.15	[0.97-1.37]	
<i>Participation in household decisions (No)</i>							
Yes	1.30**	[1.11-1.53]	1.21*	[1.03-1.41]	1.12	[0.96-1.31]	
<i>Freedom in seeking healthcare (No)</i>							
Yes	1.62***	[1.36-1.93]	1.43***	[1.20-1.71]	1.29**	[1.08-1.54]	
Community-level indicators of gender equality							
<i>Violence and discrimination against women</i>							
<i>Acceptance of domestic violence (Low)</i>							
High			0.92	[0.76-1.13]	0.90	[0.74-1.10]	
<i>Early marriage (Low)</i>							
High			0.98	[0.79-1.21]	1.04	[0.84-1.28]	
<i>Genital mutilation (Low)</i>							
High			1.25*	[1.03-1.52]	1.25*	[1.03-1.52]	
<i>Unpaid work (Low)</i>							
High			0.92	[0.76-1.12]	0.97	[0.79-1.19]	
<i>Ideal number of children (Low)</i>							
High			0.66***	[0.52-0.82]	0.76*	[0.61-0.95]	
<i>Women's rights and opportunities</i>							
<i>Assets ownership (Low)</i>							
High			1.16	[0.95-1.40]	1.26*	[1.04-1.54]	
<i>Secondary education (Low)</i>							
High			2.11***	[1.63-2.72]	1.45**	[1.08-1.64]	
<i>Exposure to FP messages (Low)</i>							
High			1.51***	[1.24-1.85]	1.33**	[1.08-1.64]	
<i>Contact with FP health worker (Low)</i>							
High			1.07	[0.89-1.28]	1.10	[0.92-1.32]	
Demographic characteristics							
<i>Household wealth situation (Poor)</i>							
Middle						1.13	[0.90-1.41]
Rich						1.79***	[1.44-2.22]
<i>Household residential area (Rural)</i>							
Urban						1.07	[0.81-1.41]
<i>Women's age (15-24)</i>							
25-39						1.25*	[1.03-1.52]
40-49						1.38**	[1.11-1.71]
<i>Women's education level (No education)</i>							
Primary						1.47**	[1.17-1.85]

Secondary & Higher				2.45***	[1.83-3.27]
Model statistics					
Log likelihood	-2783.11		-2708.2		-2657.3
Chi-square	60.4		240.7		339.6
Comparison with previous model					
Chi-square			149.82***		101.8***
Degrees of freedom			9		7
Random variance					
ICC Null= 0.20 95%CI [0.16-0.24]	0.17	[0.14-0.22]	0.10	[0.08-0.14]	0.09
Variance between clusters	0.70	[0.54-0.91]	0.38	[0.27-0.53]	0.33
Null: 0.82 95%CI [0.64-1.05]					
PVC (%)	14		55		60

Note: aOR, = Adjusted Odds Ratios, CI = Confidence Interval, ICC = Intra-class correlation, PVC = Proportional Variance Change; * p<0.05; ** p<0.01; *** p<0.001

Figures

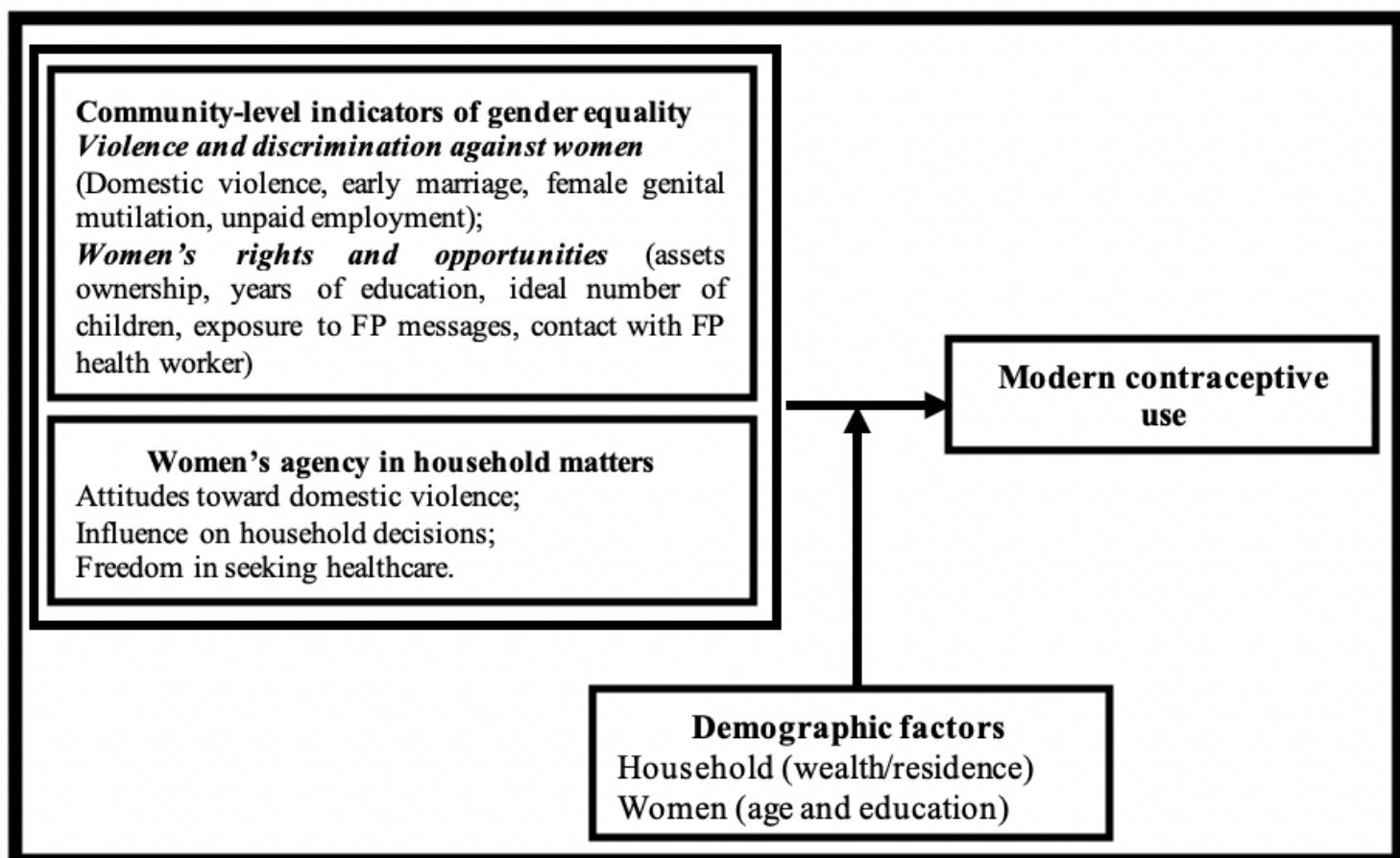


Figure 1

Conceptual framework

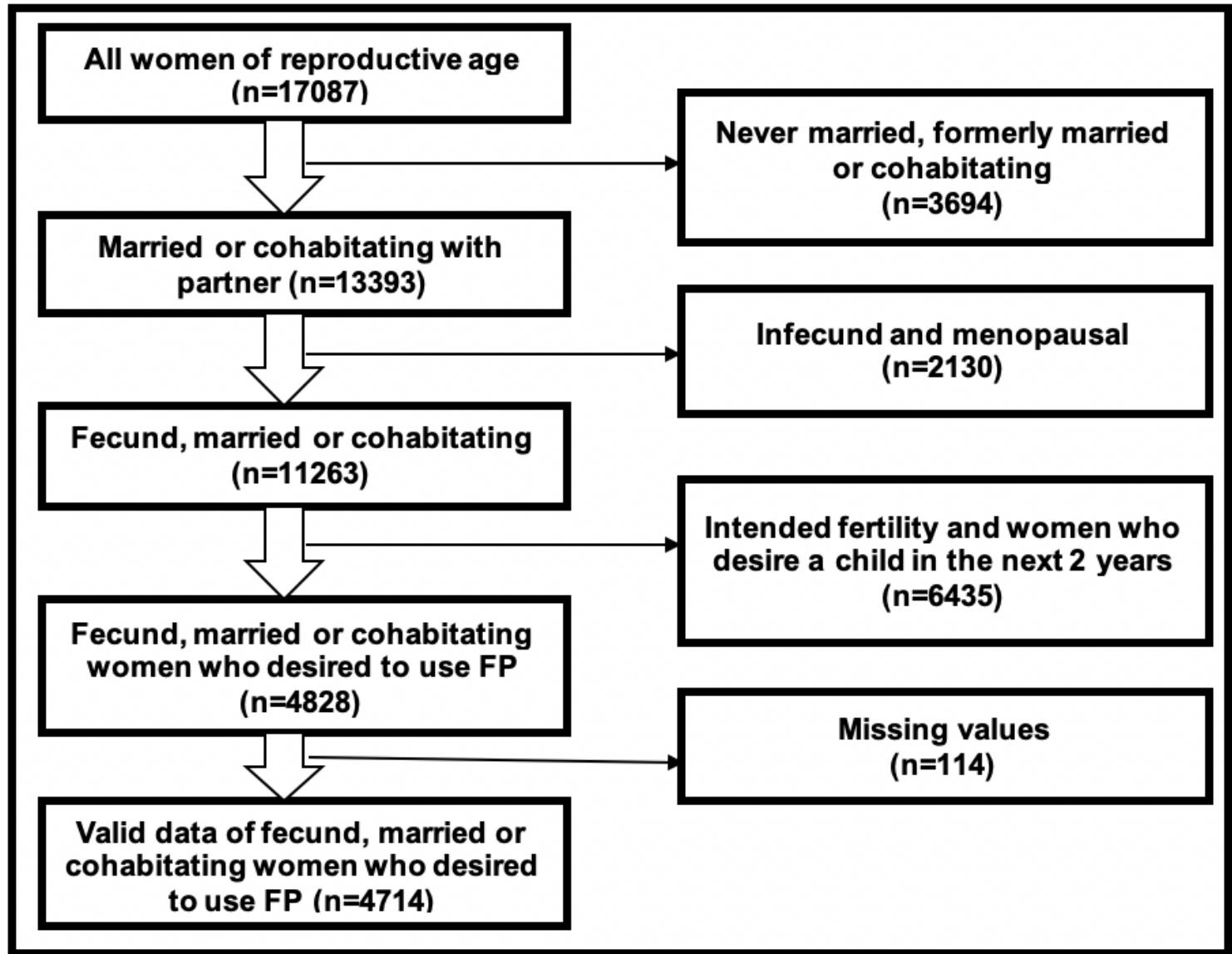


Figure 2

Flow chart of sample selection