

**International Journal of Science and Technology (STECH),
Ethiopia**

AFRREV Vol. 8 (2), Serial No 18, October, 2019: 1-18

ISSN 1994-9057 (Print) ISSN 2070-0083 (Online)

DOI: <http://dx.doi.org/10.4314/stech.v8i2.1>

**HORMONAL CONTRACEPTIVE USE AND WOMEN'S LABOUR
SUPPLY: QUALITATIVE EVIDENCE FROM KAYONZA DISTRICT
IN RWANDA**

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ABSTRACT

This study examined the impact of the side effects of hormonal contraceptives on women's health capital, which determines their ability to supply labour to sustain livelihood in subsistent agricultural communities. The findings draw upon interview data of 179 married couples in rural Rwanda. Of 138 women who experienced side effects at the time of the survey, 54 women reported that such side effects impacted their agricultural labour supply and housework from 4.96 to 2.23 hours and 3.12 to 2.19 hours, respectively. The decrease in the women's labour supply altered the intrahousehold labour allocation. On average, their husbands engaged in farming for 5.54 hours and housework for 0.80 hours per day. When the women were unable to supply labour, their husbands tended to allocate more time to housework and less time to farming. These findings infer that side effects could lead to the loss of women's bargaining power in their family and access to resources by reducing their labour supply and contribution to the household economy, and these outcomes need to be further investigated in the future. Additionally, this study emphasizes/highlights the imperious need for contraceptive switching and side effect counselling for couples to mitigate potential side effects.

Key Words: Hormonal contraceptive, women's labour supply, family planning, household economy

INTRODUCTION

Hormonal contraceptives are among the most prevalent methods used for family planning in sub-Saharan Africa (SSA) (Tsui et al, 2017). While the uptake of hormonal contraceptives has increased, the discontinuation rates remain high (Bradly et al, 2009; Sedgh et al, 2007; Tsui et al, 2017). Health concerns and side effects are among the primary reasons for contraceptive nonuse and discontinuation, which increase the unmet need for family planning, in SSA (Ali & Cleland, 2010; Bradly et al, 2009; Cleland et al, 2014; Sedgh et al, 2007; Sedgh & Hussain, 2014; Tsui et al, 2017). According to a study based on data from Demographic and Health Surveys (DHS) conducted in 51 countries, 28% of women in 31 countries in Africa (Eastern Africa: 11, Middle Africa: 5, Northern Africa: 1, Southern Africa: 3, and Western Africa: 11) reported side effects and health risks as reasons for contraceptive non-use (Sedgh & Hussain, 2014). This percentage was even higher in East Africa at 32.0% (Sedgh & Hussain, 2014). In the Republic of Rwanda (hereafter "Rwanda"), tremendous efforts have been exerted by the government to promote family planning programmes and improve contraceptive prevalence (Westoff, 2013). The prevalence rate of modern contraceptives was only 10.0% in 2005 but increased to 47.5% by 2014/2015 (NISR et al, 2015). The most commonly applied methods by married women across the country are hormonal contraceptives, such as injectables (24.0%), implants (7.7%) and the pill (8.4%), in Rwanda (NISR et al, 2015). However, 28 percent of married women

discontinue the use of contraceptives within 12 months because of health concerns and the side effects of the contraceptives, accounting for 34% of all reasons (NISR et al, 2015). Potentially, hormonal contraceptives have side effects, and symptoms, such as headache, bleeding and nausea, are expected (Grossman, 2010). Although these symptoms typically diminish within a few months (Grossman, 2010), it is highly likely that they could interfere with the everyday activities of women (Guendelman et al, 2000). A qualitative study conducted in Kayonza District, Rwanda revealed that the side effects of hormonal methods could impact women's decision to discontinue contraceptive use and their interpersonal relationships, including their marital relationships (Farmer et al, 2015). Farmer et al (2015) noted that side effects could affect women's work productivity; however, these authors did not investigate the impact on the daily livelihood activities of Rwandan women.

Women's engagement required for sustaining livelihood in rural Rwanda is substantial (African Development Bank Group, 2008; Randolf & Sanders, 1992; Rietvelt, 2017). Health, which is often referred as health capital (Mwabu, 2008), is defined as one's ability to supply labour, participation in labour, and labour allocation (Bridges & Lawson, 2011; Ghatak & Madheswaran, 2014; Ghatak, 2017; Grossman, 1972). Side effects could interfere with women's health capital and affect their labour supply. Therefore, we aim to examine the impact of the side effects of hormonal contraceptives on women's ability to supply labour and intrahousehold resource allocation in Rwanda as a case study. Overall, the welfare of farming households in developing countries, including Rwanda, is at the subsistence level. These households depend on agricultural products for home consumption, cash income from the sales of agricultural products, and wage labour. The labour supply of family members as input and that of husbands and wives is a matter of critical importance because it could directly determine agricultural productivity and income as the outcomes. This study provides insight for an understanding of the outcome of contraceptive use on livelihood in an agrarian community in SSA.

Women's Participation in Labour and Contribution to the Household Economy

Agriculture is the main pillar of the economy in Rwanda, and almost 76% of the population was hired by the agricultural sector in 2010-2011 (NIRS et al, 2011). At the district level, 79% of the population is hired by the agricultural sector, in Kayonza District (NISR et al, 2011). In total, 57% of the share of household income is derived from agriculture (NISR *et al*, 2011). Rwandan women are the primary suppliers of agricultural labour and perform tasks, such as land preparation, cultivating, weeding and harvesting, along with men (Randolph & Sanders, 1992; Rietvelt, 2017), and their contribution to agricultural production accounts for nearly 70% (African Development Bank Group, 2008). Some women are hired as wage labourers to earn cash (Randolf & Sanders, 1992). Women are also responsible for housework and childcare, which are collectively defined as reproductive labour to a great extent (Randolf & Sanders, 1992;

Rietvelt, 2017). Housework includes activities, such as cooking, cleaning, searching for fodder and firewood, visiting the market and water fetching (USAID, 2015), that are required for sustaining productive work and are crucial for maintaining daily life. The median number of hours spent by women in the Kayonza District on domestic duties in the previous seven days was 28 hours, while the corresponding number of hours spent by men was 10 hours (NISR et al, 2011).

Human Capital: Health, Labour and Production

Health capital determines individuals' labour productivity (Bridges & Lanson, 2011; Novignon et al, 2015; Straus & Thomas, 1995; Thomas & Straus, 1997) and labour participation (Lavy et al, 1995; Handa & Neitzert, 1999 as cited in Bridges & Lanson, 2011). Poor health could reduce one's hours of labour supply or days worked (Pitt & Rosenweig, 1986; Ulimwengu, 2009), and one's health status has a significant impact on his/her participation in labour wages (Straus & Thomas, 1995; Mwabu, 2008; Novignon et al, 2015). Extended periods of illness are highly likely to have a negative impact on one's ability to supply labour and could affect the household's productivity (Ulimwengu, 2009). As productivity and income decrease, one's ability to improve one's health could also decrease (Hawkes & Ruel, 2006; Ulimwengu, 2009). Side effects could affect women's ability to supply labour and impact production at the household level unless their labour supply is substituted.

Intrahousehold Labour Allocation

Health affects one's decisions regarding the allocation of labour supply (Ghatak & Madheswaran, 2014; Ghatak, 2017). When women become less capable of supplying labour due to side effects, other household members must compensate for their labour to maintain a subsistent level and their livelihood. Hypothetically, their husbands' labour supply could increase to compensate for the decrease in women's labour supply to maintain the total family labour supply. Although family members or hired labour could serve as substitutes to some extent, it is often the case that the loss cannot be fully covered, which is likely to reduce output (Ulimwengu, 2009). Additionally, Lundberg (1988) suggested that the factors affecting the formation and stability of marital relationships could be characterized by the labour supply and its allocation within the household.

Contraceptive Use and Household Welfare

Contraception reduces pregnancy-related health risks and improves women's health status (Yazdkhasti et al., 2015). Welfare programmes, including family planning programmes, should increase women's human capital, which, in turn, increases their economic viability (Canning & Schultz, 2012; Yazdkhasti et al., 2015) and enhances their control over the resources of their families (Schulz, 2001). Contraception should reduce opportunity costs as follows: women must often reduce their work hours in response to high fecundity (Kim & Assave, 2006). Additionally, the household can

increase its resources for other activities, resulting in the gain of wealth by maintaining the family size (Schulz, 2001). However, side effects could reduce women's human capital or offset its gains.

METHODOLOGY

The data were derived from the household survey and in-depth interviews conducted in the R Sector and M Sector in Kayonza District in the Eastern Province of Rwanda in March 2017. This study targeted 179 married couples who were selected across all villages (R Sector: 19 villages, M Sector: 20 villages). The age of the women ranged from 21 to 49 years at the time of the survey. Table 1 indicates the age distribution of the women with living children in the targeted households.

Table 1: Age distribution of the women interviewed and the number of living children

Women's Age Distribution		21-29	30-39	40-49	Total
Number of Women (%)		49 (27.4)	97 (54.2)	33 (18.4)	179 (100)
Age	Average	25.3	34.4	43.8	33.6
	SD	2.07	2.84	2.58	6.72
	Min	21.0	30	40	21
	Max	29.0	39.0	48.0	48.0
Number of Living Children	Average	2.0	3.9	3.6	3.6
	SD	0.89	4.11	1.83	1.83
	Min	0.0	1.0	0.0	0.0
	Max	4.0	8.0	9.0	9.0

Source: Household Survey in March 2017

A household survey aimed at identifying the proportion of women who use or previously used hormonal contraceptives at the point of the survey was used. The period of use, the perceived side effects and the symptoms were also identified by archiving the women's history of contraceptive use. The women reported the symptoms that were diagnosed as side effects by medical practitioners; however, some symptoms were self-diagnosed. During the in-depth interviews, the women and their husbands were asked about the impact of the side effects on their ability to supply labour, the number of hours they engaged in farming and housework under normal conditions, and the changes due to the side effects. Although agricultural activities are gendered depending on the crops (Rietvelt, 2017), we did not consider the differences in tasks or among the three agricultural seasons as the informants did not perceive the changes.

Additionally, interviews were conducted with 6 medical practitioners who worked for the health care facilities at which the couples received family planning services at the study site in September 2017.

RESULTS

Contraceptive Choices and Perceived Side Effects

Table 2: Contraceptive methods used by the targeted households and the prevalence (n=179)

Contraceptive Type	Injectable	Pill	Implant	Male Condom	Rhythm Method	Breast Feeding	Female Sterilization	None	Menopause	Total
Number of Women	63	18	20	18	17	4	1	36	2	179
(%)	(35.2)	(10.1)	(11.2)	(10.1)	(9.5)	(2.2)	(0.6)	(20.1)	(1.1)	(100.0)

Table 2 shows the proportion of contraceptive use at the point of the survey. Among all hormonal contraceptives, injectable contraceptives and implants were the most commonly used by 101 women, accounting for 56.4% of the women (Table 2). Of the 101 women, 45 women (44.6%) reported that their method resulted in side effects (Table 3).

Table 3: Proportion of women experiencing side effects

	Injectable	Pill	Implant	Total
No side effects (%)	40 (63.5)	10 (55.6)	6 (30.0)	56 (55.4)
Experiencing side effects (%)	23 (36.5)	8 (44.4)	14 (70.0)	45 (44.6)
Total	63 (100)	18 (100)	20 (100)	101 (100)

Source: Household Survey in March 2017

Among the participating households, eighteen couples (10%) used condoms for contraception, which is higher than the average prevalence (4.4%) at the district level at the point of DHS 2014/15 (NISR et al, 2015). In total, 138 women (77%) of 179 had previously used some type of hormonal contraceptives, yielding a cumulative total of 198 women (Table 4).

Table 4: Cumulative number of women who previously used hormonal contraceptives and experienced side effects (n=198)

	Injectable	Pill	Implant	All Methods
Total users	120 (60.6)	44 (22.2)	34 (17.2)	198
No side effects	53 (44.2)	19 (43.2)	8 (23.5)	80 (40.4)
Side effects experienced	66 (55.0)	25 (56.8)	26 (76.5)	117 (59.1)
Not yet known	1 (0.8)	-	-	1 (0.5)

Source: Household Survey in March 2017

In total, 120 women (61%) had chosen injectables, and 44 women (22%) had attempted the pill. Thirty-four women (17%) had used implants, including both the 3-year and 5-year types. Of the 198 women, 117 women (59%) reported that they had perceived symptoms or side effects from the hormonal contraceptives, and 59% (117 cases) of the women experienced side effects regardless of the method used. The proportion of women using specific methods who experienced side effects were as follows: 55% (66 cases) of the women using injectables, 57% (44 cases) of the women using the pill and 76% (26 cases) of the women using implants. Dizziness (38 cases) and spotting/bleeding (36 cases) were reported by most women, followed by cramps/backache (34 cases) and headache (28 cases). The other side effects (33 cases) included weight gain, increased thirst, increased blood pressure, mood swings, and decreased libido.

Table 5 shows the period of use of the hormonal contraceptives. When the average period of use was compared between those who did and those who did not experience side effects, those without side effects tended to use hormonal contraceptives for a longer period as follows: 9.3 months longer among those using injectables (36.5 months for users without side effects and 27.2 months for users with side effects) and 8.3 months longer for those using the pill (25.8 months for users without side effects and 17.5 months for users with side effects).

Table 5: Period of hormonal contraceptive use (in months; n=198)

	Injectable	Pill	Implant	All Methods	
	(n=120)	(n=44)	(n=34)	(n=198)	
Total	Average	31.10	21.10	38.90	30.10
	SD	24.44	24.04	24.48	24.95
	Min	0.20	0.10	0.03	0.03
	Max	120.00	96.00	96.00	120.00
Used without side effects	(n=53)	(n=19)	(n=8)	(n=80)	
	Average	36.50	25.80	35.60	33.90
	SD	24.40	25.74	34.24	25.83
	Min	0.20	0.10	0.03	0.03
Used with side effects	Max	96.00	96.00	96.60	120.00
	(n=66)	(n=25)	(n=26)	(n=117)	
	Average	27.20	17.50	41.40	27.50
	SD	23.79	22.48	21.19	24.21
Not yet known	Min	3.00	0.10	1.20	0.03
	Max	120.00	84.00	96.00	120.00
Not yet known	(n=1)	-	-	-	
	3.00	-	-	-	

Source: Household Survey in March 2017

However, those who used implants and experienced side effects used the method 5.8 months longer (41.4 months) than those who used implants and did not report any side effects (36.5 months). When couples seek access to family planning services for the first time, they need a consultation with medical practitioners at the health care facility. Before applying for hormonal contraceptives, women undergo a medical check-up, including a blood pressure test, to investigate whether the hormonal contraceptives could be safely applied (Interviews with medical practitioners in September 2017). The women we interviewed were well informed of the potential side effects before they started using the hormonal methods. The first contraceptive choice tended to be made by the women with the advice of medical practitioners. Most women choose injectables and the pill because these methods are easy to start and switch if they experience side effects. The women who perceived side effects consulted with medical practitioners to obtain their advice regarding whether they should switch or discontinue the hormonal contraceptive.

Impact on Women's Ability to Supply Labour

We further examined the health impact of hormonal contraceptives among women (n=138) who had previously used any type of hormonal contraceptives. Eighty-two women reported that they had experienced side effects as shown in Table 6.

Table 6: Health impacts of hormonal contraceptives (n=138)

		No side effects (%)	56 (40.6)	
Number of women who have ever used hormonal contraceptives	138	Side effects experienced (%)	No impact on labour supply	24 (29.3)
			Impact on labour supply	54 (65.9)
			Not aware	4 (4.9)

Source: Household Survey in March 2017

Among those who reported side effects, 54 women (66%) further claimed that the side effects had impacted their ability to supply labour. Twenty-nine women (54%) reported an impact on performing farming tasks only, and 25 women (46%) reported an impact on performing both farming and housework tasks.

Table 7. Women's labour supply in couples in which women using contraceptives experienced side effects or no side effects (n=54)

		Without side effects	With side effects	Difference
		(n=54)	(n=54)	(n=54)
Work Hours_Farming (hrs)	Average	4.96	2.23	-2.74
	SD	1.22	4.41	1.67
	Min	3.50	0.00	-8.00
	Max	12.00	6.00	1.00
		(n=40)	(n=45)	(n=25)
Work Hours_Housework (hrs)	Average	3.12	2.19	-1.39
	SD	1.12	1.26	0.95
	Min	1.00	0.00	-4.00
	Max	8.00	6.00	1.00

Source: Household Survey in March 2017

Table 7 presents a comparison of the daily labour supply of women with and without side effects (n=54). When there were no perceived side effects due to the hormonal contraceptives, the women engaged in farming for 4.96 hours and spent an average of 3.15 hours on housework. However, once they experienced side effects, they could engage in farming for 2.23 hours and housework for 2.19 hours per day. The working hours decreased by an average of 2.74 hours for farming and 1.39 hours for housework.

The symptoms, especially headache, cramps/backpain, and dizziness, affected the labour supply.

Impact on Labour Allocation

The decreases in the women's labour supply altered the intrahousehold labour allocation, especially that of the husbands.

Table 8. Husbands' labour supply in couples in which women using contraceptives experienced side effects or no side effects (n=54)

	Without side effects	With side effects	Difference	
	(n=45)	(n=46)	(n=20)	
Work Hours_Farming (hrs)	Average	5.54	5.05	-0.9
	SD	1.64	1.76	2.51
	Min	4.00	1.00	-8.00
	Max	12.00	11.00	4.00
	(n=54)	(n=54)	(n=22)	
Work Hours_Housework (hrs)	Average	0.80	1.41	1.50
	SD	1.07	1.37	0.72
	Min	0.00	0.00	0.50
	Max	3.00	4.00	3.00

Source: Household Survey in March 2017

Table 8 shows a comparison of the labour supply of the husbands between the cases of women who use hormonal contraceptives with and without side effects. On average, the husbands engaged in farming for 5.54 hours and housework for 0.80 hours per day. However, once the wives were unable to supply labour due to side effects, the husbands tended to allocate more time to housework (1.41 hours) and less time to farming (5.05 hours). The time allocated to farming decreased by 0.9 hours, and the time allocated to housework increased by 1.50 hours because the husband had to "finish the farming tasks quickly and come home earlier to cook and take care of the kids since mama (his wife) was feeling sick" (Man in his 30s, R Sector, March 2017). In most cases, the husband supplemented the housework when the wife could not fully supply labour. However, as presented in Figure 1, the total work hours of the household decreases after women start experiencing side effects, suggesting that their husbands cannot completely replace their labour.

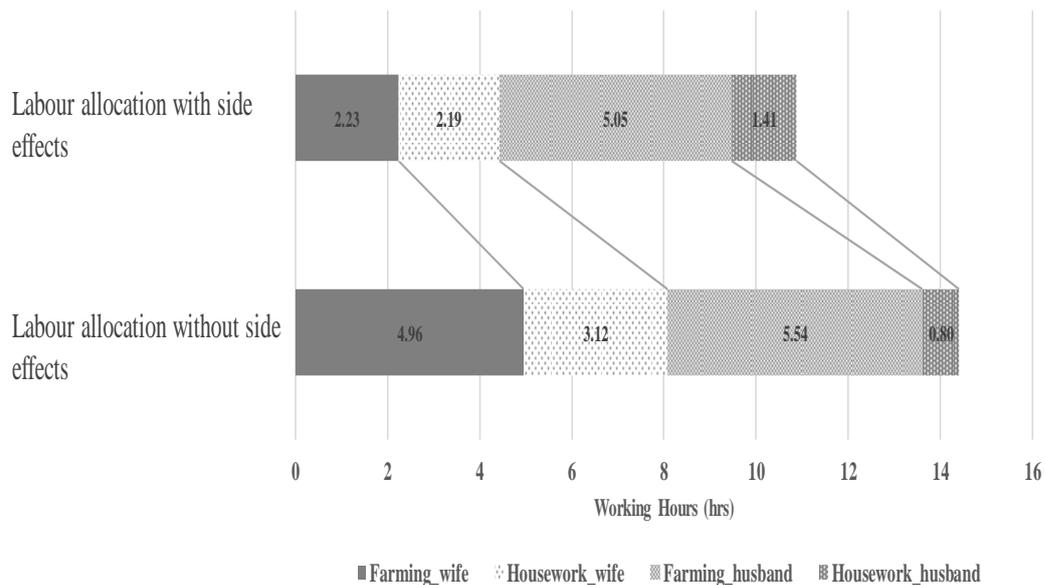


Figure 1. Changes in the intrahousehold labour allocation

Source: Household Survey in March 2017

Some couples had an alternative countermeasure. Fourteen of 54 couples reported that their children or relatives helped with housework, and 5 couples hired wage labour as a supplement when the wife could not engage in farming, resulting in an additional expense.

Impact on Livelihood

The in-depth interviews captured the perceived impact of the side effects on agricultural production, and food security at the household level decreased as indicated in the following quotes by the couples:

We only managed to cultivate half of our farmland because mama was feeling sick. We are afraid that we would not have a sufficient harvest to feed everyone at home (Couple A in their 40s, M Sector March 2017).

We harvested 50 kg of beans in the last season, but we only harvested 20 kg this season because mama could not fully participate in farming. She was feeling sick because she started using an injection, and she experienced side effects (Couple B in their 30s in M Sector, March 2017).

Mostly, women engage in wage labour due to the need for cash and receive 500 to 800 Rwandan franc (RWF) per day in the respective community. The women engaging in

wage labour on a regular basis reported that they became less capable of earning cash because the number of days they could work was reduced due to the side effects as follows: “I used to work 20 days per month, but I can only work 12 days per month; so, I get paid less” (Woman C in her 30s, R Sector, March 2017). In the case of wage labour, the ability to work directly influences the cash income.

Impact on the Marital Relationship

Moreover, we identified that some husbands perceived that their wives failed to fulfil their responsibility in farming and housework, which often created conflicts between the women and their husbands.

Papa (her husband) thought I became lazy because I could not work in the field (farmland). I was not feeling well because of the side effects, and I had to lie down. Papa (her husband) became angry. We had a fight (Woman D in her 40s, R Sector, March 2017).

Farmer et al (2015) indicated that side effects could affect the marital relationship by making some women reluctant to engage in sexual activities due to the symptom of a reduced libido. In the cases we observed, the changes in the labour allocation affected the marital relationship as indicated by Lundberg (1988). Women’s decreased ability to supply labour and productivity create tensions with the husband. The side effects have a negative impact on not only women’s physical well-being but also couple’s psychological well-being.

Discontinuation and Non-use of Hormonal Contraceptives

Of 179 women, 36 women (20.1%) applied a non-hormonal method as follows: male condom, rhythm method, and female sterilization (Table 2). Thirty-six women (20.1%) were not using any method. Among these 36 women, 11 women were not using any method, although they did not want to have any additional children. Of these 72 women, 34 women had previously used hormonal contraceptives and stopped/switched due to perceived side effects.

We decided to continue hormonal contraceptives regardless of the side effects. Mama cannot work much, and we may have to survive on less food, but we cannot stop (using the injectable) because we cannot afford to have more children (Couple E in their 40s, M Sector, March 2017).

Mama’s health is more important; so, we stopped (using hormonal contraceptives). Mama not being able to work is worse than having additional children. If an accident happens (if the wife gets pregnant), we will have to accept it and manage (Couple in their 30s, R Sector, March 2017).

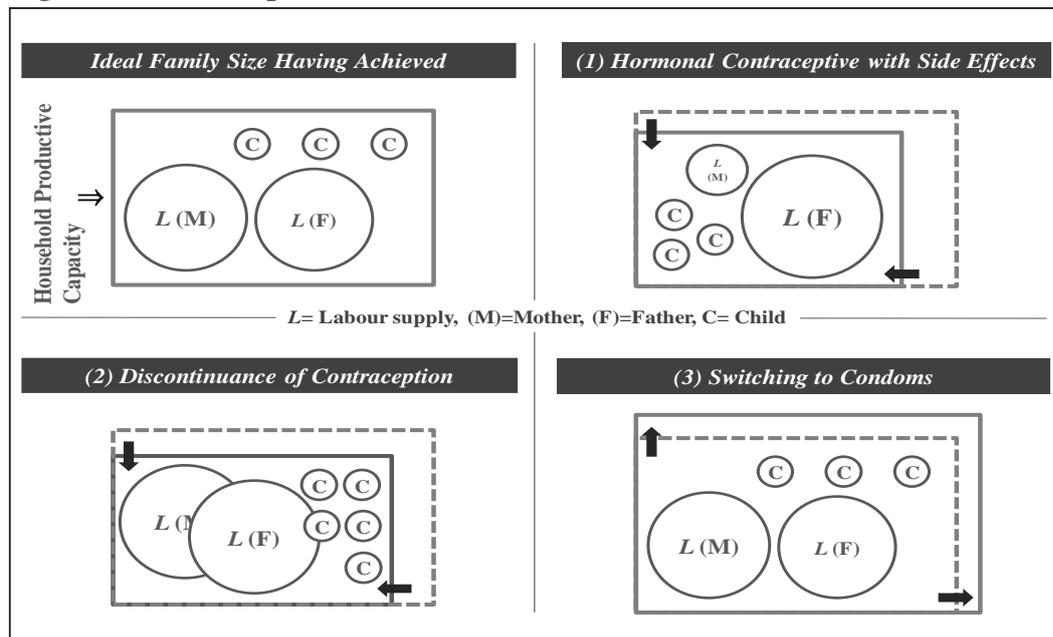
While the couples who had given up on hormonal contraceptive use because of side effects had unintended pregnancies, those who used or previously switched to condoms reported that they did not perceive any side effects and could still prevent unintended pregnancies.

DISCUSSION

Contraceptive Choices and Outcomes

As shown in Figure 2, we summarized the potential outcomes based on the findings as follows.

Figure 2. Contraceptive choices and outcomes



Source: Generated by the authors based on the findings

(1) Hormonal Contraceptive Use and Side Effects

The couples tended to continue with the hormonal contraceptive despite the side effects because they were unable to afford any additional children. The couples compromised the women's health and labour supply, which could negatively impact agricultural production and income generation. The husbands must complete several of the women's tasks, and the increasing physical or psychological burden on the husbands could possibly affect their health and well-being in the long-term.

(2) Discontinuance of Contraception

By discontinuing the use of hormonal contraceptives, the risk of unintended pregnancies could increase. A growth in family size may generate new resource

constraints and raise women's opportunity cost. Increasing pregnancy-related health risk may lead to the loss of women's economic viability.

(3) Switching to Condoms

Couples who switched to condoms seem to appreciate the benefit of contraception the most without women's health and their labour supply being affected by any side effects and can maintain the family size.

Potential Impact on Bargaining Power

The results infer that side effects may affect women's bargaining power. Women in developing countries often gain bargaining power by contributing to the household economy, such as by producing and managing agricultural crops and securing their individual income sources (Doss, 2003; Kurosaki and Ueyama, 2002; Schulz, 2001). One's bargaining power in the household determines the intrahousehold resource allocation as follows: the distribution of food, clothes, money for health care services and other goods. Studies conducted in agrarian communities in developing countries, including SSA, have provided evidence that when women have substantial bargaining power against their husbands, a positive effect is observed on child health and nutrition because they allocate necessary resources to meet their children's needs (Kurosaki and Uehara, 2002; Schultz, 2001). Theoretically, side effects could lead to the loss of women's bargaining power and access to resources by reducing their labour supply and contribution to the household economy. The consequences must be examined to obtain a better understanding of the long-term impact of side effects on women's health capital and their livelihood and the household welfare in subsistent farming communities.

Recommendations: Contraceptive Switching and Side Effect Counselling

The findings suggest that the diffusion of modern contraceptive methods must be considered not only from the perspective of effectiveness and efficiency but also from the perspective of the coherency with the livelihood activities performed by potential users. The findings highlight the significance of side-effect counselling as suggested by Choi (2018). Comprehensive and long-term counselling could be necessary not only when deciding about the contraceptive methods but also follow-ups could be critical to detect side effects as soon as possible to minimize potential negative outcomes. Specifically, there is an urgent need for couple counselling, which encourages switching when women experience side effects. Male condoms could be an alternative option that could be effective for preventing unintended pregnancies without interfering with women's health. Condoms are not commonly used for family planning in SSA due to social and cultural reasons (Maticka-Tyndale, 2012). There is an urgent need to investigate the barriers to condom use in the Rwandan context to increase couples' contraceptive options.

CONCLUSION

Women's health, which determines their ability to supply labour, is among the most important forms of human capital for sustaining one's livelihood in subsistent agricultural communities. Contraceptive use must serve as a means to alleviate the lack of optimal household welfare by minimizing the risk of unintended pregnancies. The application of hormonal contraceptives with side effects is not consistent with the objective because it harms women's ability to supply labour and well-being. This study highlights the significance of family planning counselling services to mitigate side effects and the negative impact on livelihood, especially in the agrarian communities in SSA.

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ACKNOWLEDGEMENTS

We would like to thank the couples kindly participated in this study. This study was partially funded by (1) a Grant-in-Aid for JSPS (Japan Society for the Promotion of Science) Fellows (JSPS KAKENHI Grant Number JP 17J09349) and (2) a Grant-in-Aid for Scientific Research (C) (JSPS KAKENHI Grant Number JP 16K07920).