

Original Research Article

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Knowledge, Attitude and Practice of Family Planning Methods among Pregnant Women Attending Antenatal Clinic at Six Health Facilities in Rwanda

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ABSTRACT

The fertility rate in Rwanda decreased from 6.1 in 2005 to 4.6 in 2010 and to 4.2 in 2015. Widespread use of contraceptives has played a main role in this decrease. A cross sectional study was conducted on knowledge, attitude and practices of family planning methods on 426 pregnant women attending antenatal clinic in six health facilities in Rwanda. To assess the knowledge, attitude and practice of family planning methods and to determine the past and future intent of post-partum contraceptive use and factors associated with discontinuation of family planning methods among pregnant women attending antenatal clinic in Rwanda. A systematic random sampling method was used to select pregnant women who came for antenatal in each site. Data was collected using a standardized questionnaire and entered into a database. Chi-square tests were used for comparison and correlation between variables. $P < 0.05$ was considered statistically significant. 94.1% pregnant women attending antenatal clinic in Rwanda are familiar with at least 2-3 family planning methods with low knowledge about LARCs. 62.7% used modern contraceptive methods prior to the current pregnancy. Depoprovera, pills and Jadelle were the most used modern family planning methods. 91.1% of pregnant women intend to use modern contraceptive methods postpartum, mainly Jadelle, Depoprovera, and IUD. Higher number of gravidity and living children and occupation were found to be associated with the past contraceptive methods use and intent of post-partum contraceptive use. Fear of Side effects, desire for additional children and husband or sexual partner decision were found to be associated with the no use of contraceptive. Contraceptive awareness and attitude amongst pregnant women attending antenatal clinic in Rwanda was excellent (94.1%) with fair use (62.7%) of available methods. Barriers on no use of contraceptive methods should be addressed individually.

Keywords

Areca nut, UHPLC, Redox titration, Vitamin B₆, Vitamin C

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Introduction

Rwanda has experienced a slight decrease of fertility rate, however, it is still high compared to the rest of the world. The fertility rate in Rwanda decreased from 6.1 in 2005 to 4.6 in 2010 and to 4.2 in 2015. Wide use of contraceptives has played the major role in this decrease (National Institute of Statistics of Rwanda, 2010; National Institute of Statistics of Rwanda 2014-2015) Recent data show that maternal mortality ratio in Rwanda has decreased from 750 to 540 per 100,000 livebirths in 2008, to 383 in 2010, and to 210 in 2015 (Health Management Information System). The percentage of women using contraceptive methods increased from 10% in 2004, 27% in 2007 to 53% in 2015. Ensuring supply and availability of contraceptive methods will allow the fertility rate to continue to decrease and for family size to be planned. Awareness of people's attitudes and perceptions is very crucial, their attitude and adherence to contraception were found to play an important role in reducing unintended pregnancies. Different DHS (Demographic and Health Survey) in RWANDA show that the use of modern contraceptive methods has increased at around ten times, 4%, 10%, 27%, 45% and 47% from RDHS (Rwanda Demographic and Health Survey) 2000, RDHS 2005, IRDHS 2007/2008, RDHS 2010 and RDHS 2014-2015 respectively and awareness and cognitive barriers are among other barriers that are compromising important adherence (WHO 1990-2010; National Institute of Statistics of Rwanda, 2010; National Institute of Statistics of Rwanda 2014-2015; WHO, 2013; Population Division, 2012).

Assessment of the contraceptive use continuation, switching and failure are very sensitive determinants of how well programs are responding to the family planning needs of women and couples. It will also reveal what is

going well and what is going poorly in the knowledge of contraceptive users, their education, and gap in services they receive.

Studies showed that different areas in any health facilities can work as place where family planning methods can be discussed, especially in Prenatal care clinics but also some other places are source of information like teaching and classroom discussion (Oluwasanmi *et al.*, 2011; Anthony, 2003).

Family planning is one of the interventions that can promote poverty reduction and socioeconomic development of the country through limiting and spacing births (Ministry of Health, 2012; WHO, 2012).

Studies done in Nigeria and in Ethiopia showed that pregnant women have sufficient knowledge (80-95%) with low practice of modern family planning. Mass media and health workers were the most common source of information. Birth spacing and limiting births as well reduction of maternal mortality were mainly identified as benefits of family planning. (Igwegbe *et al.*, 2010; Ikechebelu *et al.*, 2005; Tilahun *et al.*, 2013; Takele *et al.*, 2012)

Other studies studied barriers of modern contraceptive methods use and the main barriers have been identified to be poor knowledge of available methods, poor experience, fear of side effects, husband and partners decision, low education level and religious believes (Igwegbe *et al.*, 2010; Noone, 2004; Alemayehu *et al.*, 2012).

Studies done in Ethiopia on intention to use and demand of long acting and permanent contraceptive methods (LAPMs) and factors affecting it among married women revealed that intention to use LAPMs was 48.4%, higher among women who knew at least one of LAPMs and women who do not want to

have birth within the next 2 years and poor intention to use LAMP among women who perceive poor support from their husbands and those who perceive LAPMs are harmful for the womb. Participants expressed their on the return of fertility after using implants or IUCD (Intrauterine Contraceptive Device) as well as insertion and removal procedures. Despite of good intention, the demand and use of LAPMs were low in both studies (demand of 18.1% utilization of 8.7%) (Gebremariam, 2014; Takele, 2012).

With this study, we aimed to gather a general picture of pregnant women's awareness of contraceptive options, past methods used, barriers to use and methods they plan to use after birth.

Results of this study will help health providers and policy makers identify where there is a gap in family planning services delivery and to help find a way to improve it. Results will be disseminated within different health facilities and will be presented in different conferences on health care delivery.

On the best of our knowledge there is no study in RWANDA that shows the current status on knowledge, attitude and practice of family planning among women and among pregnant women in particular and it is not well known the reason why the use of contraceptive methods is still at 52% while all methods are for free in public health facilities.

Materials and Methods

We evaluated the knowledge and attitude on available modern family planning methods, past and future intent of post-partum contraceptive use among pregnant women attending antenatal clinic in six health facility in Rwanda. We assessed also factors associated with no use and discontinuation of contraceptive method.

This study is a health facility based cross sectional, qualitative study design and was conducted in six health facilities in Rwanda including two referral hospitals, two district hospitals and two health centers, namely CHUB (A referral and University teaching hospital), KABUTARE District Hospital and RWANIRO health center located at Southern province; CHUK (a referral and a university teaching hospital), KIBAGABAGA District Hospital and MUHIMA Health Center located in KIGALI town. From the national health policy, all modern contraceptive methods have to be offered at the level of Health Center apart from irreversible permanent contraceptive methods, such as tubal ligation and vasectomy, but it is not always the case as they are also being offered at all level of health facilities. Beneficiaries of those methods have different economic and social classes from health centers to referral hospitals and from rural to urban area. So to decrease bias and confounder elements that arise from this difference, in this study a mixing of health facilities is being used where CHUB as referral hospital, KABUTARE as District hospital and RWANIRO as health center are representing health facilities in rural area; CHUK as a referral hospital, KIBAGABAGA as a district hospital and MUHIMA Health center are representing health facilities in urban area.

We included all women who came for antenatal care at a health facility included in the study within the study period and who consent to participate voluntarily regardless the gestation age and regardless of their parity and living children are included in this study.

Systematic random sampling method was used to select pregnant subjects of the study in six different sites during the study period. To reduce bias and to give an equal chance to all respondents to be selected; at each health facility in this study and for each day of

antenatal consultation; for every five attendees of those who gave their consent to participate in this study a questionnaire and assistance are given by a data collector.

Data will were collected in a period of three months maximum of the same period for each site, this is from July to September 2015.

As this study is a population base cross sectional study, its sample was calculates used the following formula : $n \geq \frac{Z^2 (P) (1-P)}{d^2}$ where: n: the minimum size required

Z: Z- score corresponding to the level of confidence with which it is desired to be sure that true population lies with $\pm d\%$ point of the sample estimate (unless otherwise noted, assume 2 sided test with $\alpha = 0.05$, $Z= 1.96$)

P: Expected population proportion (unless otherwise noted, assume $P= 0.50$ to obtain the most conservative estimate for n)

d: Precision required

Rwanda MDHS (mid demographic and helath survey) 2012 shows that the prevalence of contraceptive use is 52% and similar studies done elsewhere reveals around 80% as the knowledge of pregnant women on contraceptive methods. Based on those two figures our targetted sample would be 422pregnant women and 271 pregnant women from a prevalence of 52% and 80% of knowledge respectively.

We expanded the sample to 426 pregnant women-71 pregnant women from each health facility included in this study.

Data were collected using a chart of semi-structured questions and the subject had to answer questions through a trained data collector on a preset questionnaire. Data collectors had a training of one day before

starting data collection and each site had one data collector who stayed always present to handle any concern on the questionnaire from respondents.

Data collectors collected data on knowledge of contraception by asking the respondent to describe all contraceptive methods she knew and asking whether the respondent recognized it, used it and if she plans to use it, when she think it is a good time to start contraception after birth and barriers on compliance were also collected. Information was collected on 11 modern family planning methods: female and male sterilisation, pills, intrauterine devices (IUDs), injectables, implants, male and female condoms, lactational amenorrhoea method (LAM), emergency contraception, and Standard Days Method (SDM).

Data was collected using standardized questionnaire and database created using EPIDATA version 3.1 and will exported into STATA 13 for analysis.

Chi-squared tests will be used for multivariate analysis for comparison and correlation between knowledge, attitudes, use of contraceptive methods. Probabilities $P<0.05$ will be considered for significant statistical difference.

In this study, the knowledge of our respondents of family planning methods was graded as follow:

For all respondents who do not know any modern contraceptive methods, her Knowledge will be considered as very poor knowledge and for all those who knew only one method their knowledge is considered as poor knowledge

If Percentage of respondents who know at least two methods is less than 60%, this will be considered as poor knowledge,

If Percentage of respondents who know at least two methods is between 60-69%, this will be considered as fair knowledge.

If Percentage of respondents who know at least two methods is 70-80%, this is satisfactory knowledge

If Percentage of respondents who know at least two methods is more than 80%, this is excellent knowledge.

In this study, as the subjects were contacted and interviewed, all participants gave their consent before enrolling. Its proposal protocol was approved by CMHS/UR (College of Medicine and Health Sciences) Institutional Review Board, CHUK and CHUB Institutional Review Board. Permission from relevant authorities of different sites was obtained before starting data collection. To ensure confidentiality of data given by participants; patient identifiers, such as name and address, were not collected. Data extraction was conducted by a trained health professional (a midwife, an intern, medical student or medical doctor) who are trained on medical research ethics.

Results and Discussion

In this study 426 pregnant women were included through systematic random sampling where after five pregnant women attending antenatal clinic in each of six health facilities one of them is recruited. 71 pregnant women were recruited in each health facilities.

The mean age of respondents was 27year-old, the youngest woman was 17year-old and the oldest was 42year-old. Respondents were mainly of 25-29year-old, 30-35year-old and 20-24year-old groups as they were 31.9%, 25.4% and 22.5% of all sample size respectively. Most of the women were of primary level of education (40.61%), followed

by secondary (30.99%) and higher level of education (22.07%) respectively. The most common religions amongst the participants were catholic and protestant on almost equal proportion (40.85% and 40.38% respectively), followed by adventists (12.21). Most of them were farmers and of no formal job on almost the same proportion (34.51% and 31.69% respectively) followed by privates and public servants respectively (20.66% and 13.15%). Most of the respondents in this study were having so far 1-3 pregnancies (72.07%) followed by those of 4-6 pregnancies (26.53%) and most of them were having 1-3 children (62.44%) and 23.47% were with no child (Table 1).

Results of this study shows that pregnant women attending antenatal clinic in Rwanda have excellent knowledge of available modern family planning methods, as 94.09% (401/426) pregnant women know at least 2-3 family planning methods. Implants (Jadelle), IUD, Pills and injectables (Depoprovera) were reported to be known by most of respondents while the fewest number of respondents knew about emergency contraception. When we subgroup respondents in small groups, we find that most of respondents have fair to good knowledge on available modern family planning methods as 51.4% (219/426) of them know 4-5modern contraceptive methods over 11methods investigated while 34.50% (147/426) of them know 2-3methods over 11methods. However, only 31.9% (136/426) of respondents had no knowledge of long-acting reversible contraceptive methods compared to 13.83% (59/426) and 8.19% (35/426) who knew only Jadelle and IUD respectively and separately. Only 1.88% (8/426) of respondents know both long-acting reversible contraceptive methods (IUD and Jadelle). Most of respondents know the importance of modern family planning methods as 88.5% (377/426) know at least two important uses of family planning methods.

Birth spacing was reported by most of the respondents 78.4% (334/426) as importance of family planning methods use followed by improving life of the mother and the baby 43.90% (187/426) and prevention of unwanted pregnancy 23.24% (99/426). More than a half of respondents know at least two sources of information on family planning methods 55.17% (325/426) and 41.55% (177/426) know at least one source of information.

Health facilities were reported by most of the respondents as the first source of information, followed by Community Health Workers and media respectively (Table 2).

When we assessed attitude, consideration and appreciation of modern family planning methods use by respondents, this study showed that most of respondents appreciate modern family planning methods use as 92.96 % (398/426) reported that using them is very important. And accessibility to family planning methods is granted as 80.52 % (343/426) of respondents strongly agree with the fact that they can have access to all contraceptive methods and given by competent health care providers.

Concerning husband and sexual partner involvement this study shows that most of pregnant women 72.30% (308/426) reported that their husbands and sexual partners support modern contraceptive use and 43.66% (186/426) of respondents strongly disagree with the fact that a husband or sexual partner can decide whether or not to use any contraceptive method, however 19.48% (83/426) strongly agree that their husbands or sexual partners can decide for them. Almost a half of the respondents 46.47% (198/426) strongly agree with the fact that they can not decide themselves to use any form of modern contraceptive methods without consulting their husbands or sexual partners while 19.01 % (81/426) can decide themselves to use any

form of modern contraceptive methods on their choice. In this study most of pregnant women have a positive attitude as 38.49% (164/426) strongly disagree with the fact that LARC can cause harm to someone's uterus, 20.66% (88/426) agree with it while 21.13% (90/426) are not sure of either LARCs are harmful or not to the uterus (Table 3).

In total 62.67% (267/426) respondents used contraceptive methods before getting the current pregnancy. While 37.33% (159/426) respondents did not use any contraceptive due to various reasons. Depoprovera, pills and Jadelle were the most used modern family planning methods respectively. Reasons of no use of modern family planning methods are mainly fear of side effects and religious believes. Higher number of gravidity, higher number of living children, and occupation were found to be associated with the past contraceptive methods use ($p < 0.01$). Side effects, more children and husband or sexual partner decision were found to be associated with the no use of contraceptive ($p < 0.01$).

When we compare past contraceptive use among health facilities included in this study, we found that pregnant women in referral hospitals (CHUK and CHUB) were less likely to use contraceptive methods in the past while pregnant women in District Hospitals and Health Centers were using various form of contraceptions ($p < 0.01$).

There was no significant association between religion and the past contraceptive use among respondents ($p = 0.41$) (Table 4).

This study showed that most of the respondents stopped or changed the contraceptive methods because they wanted another child 40.38% (172/426), 35.45% (151/426) were not using any form of modern contraceptive methods and 17.37% (74/426) stopped contraceptive methods due to severe

side effects and 4.46% (19/426) pregnant women report the current pregnancy is a result of failed contraceptive methods (Table 4).

Most of respondents 37.56% (160/426) plan to have another pregnancy in more than 5years, 23.71% (101/426) plan no further children and 18.31% (78/426) are not sure of the time they will have another pregnancy. A higher number of living children was associated with planning another pregnancy later than those with lower number of living children ($P<0.01$). Pregnant women with 4-6 living children are most likely to plan the next pregnancy later (>5 years) and if not they do not desire further childbearing and also most likely to use permanent contraceptive methods ($p<0.01$). The future intent on contraceptive methods is mainly based on Jadelle, Depoprovera, and IUD use as respondents plan to use those methods at a rate of 24.18% (103/426), 23.24% (99/426) and 14.32% (61/426) respectively. Some of respondents deny any contraceptive methods use 4.93% (21/426) while 3.29% (14/426) of all respondents plan to use irreversible contraceptive methods (Bilateral tubal ligation). Higher number of gravidity and living children were associated with use of contraceptive methods in the future ($p = 0.04$). Pregnant women with one to three living children were most likely to use contraceptive methods in the future as compared to those with no living child. There is an association between a Past contraceptive method use with an intent of post-partum contraceptive methods use among pregnant women, as those who used any form of contraceptive methods are most likely to use it again in the future ($p<0.01$). There is also an association between reason of family planning methods discontinuation with the intent of post-Prtum contraceptive use. Pregnant women who stopped the past contraception as they wanted another child are most likely to use a form of modern contraception, and those who

reported to stop the method due to side effects are less likely to use it in the post-partum ($P<0.01$). Most of respondents know on almost equal proportion that contraception can be started immediately after delivery and within 6weeks post-partum, 28.17% (120/426) and 30.99% (132/426) respectively). While 17.37% (74/426) of respondents know that contraception can be started by the time they resume menses, 14.55% (62/426) of respondents do not know when to start contraception in post-partum. Pregnant women in referral hospitals are less likely to know exactly the best time to start contraception in post-partum than those in district hospitals and Health Centers ($p= 0.01$). Most of respondents 82.68% (339/426) know that they will get their contraceptive method from public health facilities, 3.17% (13/426) will get it from private health facilities and (28/426=6.6%) will get them from community health workers (Table 5).

Most pregnant women attending antenatal clinic in Rwanda have excellent knowledge of available modern family planning methods as 94.09% know at least 2-3 family planning methods. Implants (Jadelle), IUD, Pills and injectables (Depoprovera) were reported to be known by most of respondents while emergency contraception was the last one to be known. This knowledge is greater than that found in studies conducted in Nigeria and Ethiopia. Those studies report knowledge of available modern family planning methods to be at around 80% and the Rwanda DHS2010 reported that knowledge of at least one method was universal for both women and men (National Institute of Statistics of Rwanda, 2010; Ikechebelu *et al.*, 2005; Tilahun *et al.*, 2013). Most commonly known modern contraceptive among pregnant women are similar to findings from Rwanda DHS 2010 and DHS 2014-2015 (National Institute of Statistics of Rwanda, 2010; National Institute of Statistics of Rwanda, 2014-2015).

Table.1 Socio-demographic characteristics of respondents (N=426)

Age of respondents (years)	Number	Percentage
15-19	18	4.23
20-24	96	22.54
25-29	136	31.92
30-34	108	25.35
35-39	56	13.15
≥40	12	2.82
Religion		
Catholic	174	40.85
Adventist	52	12.21
Protestant	172	40.38
Islam	18	4.23
Other	10	2.35
Occupation		
No formal Job	135	31.69
Public services	56	13.15
Farmer	147	34.51
Private	88	20.66
Living children		
0	100	23.47
1-3	266	62.44
4-6	39	9.15
>6	21	4.93

Table.2 Knowledge of respondents on available modern contraceptive methods

Kinds of contraceptive methods known by respondents		Number	Percentage
No methods known (Very poor knowledge)		9	2.11
One method known (Poor knowledge)		16	3.80
At least two modern FP methods known	2-3 methods known (Fair knowledge)	147	34.50
	4-5 methods known (Good knowledge)	219	51.40
	6-9 methods known (all) (very good knowledge)	20	4.70
	All methods known (Excellent knowledge)	15	3.52
Most effective methods			
IUDs		35	8.19
IUDs, depoprovera		2	0.47
IUDs, jadelle		8	1.88
LAM		3	0.70
Condom, SDM		49	11.5
Depoprovera		88	20.66
I do not know		136	31.92
Jadelle		59	13.83
Pills		30	7.04
Pills, depoprovera		6	1.41
tubal ligation, vasectomy		10	2.35
Importance of family planning			
No importance		11	2.58
One important use of family planning		38	8.92
At least two important use of family planning methods		377	88.50
Source of information on family planning methods			
No known source of information		14	3.28
One source of information		177	41.55
At least two sources of information		235	55.17

Table.3 Attitudes on family planning methods by respondents (n=426)

Access to all contraceptive methods and given by competent health care providers	Number	Percentage
Strongly agree	343	80.52
Agree	36	8.45
Not agree nor disagree	37	8.69
Disagree	5	1.17
Strongly disagree	5	1.17
My husband or partner supports modern contraceptives use		
Strongly agree	308	72.30
Agree	41	9.62
Not agree nor disagree	47	11.03
Disagree	16	3.76
Strongly disagree	14	3.29
A husband or sexual partner decides whether or not to use a contraceptive method		
Strongly agree	83	19.48
Agree	23	5.40
Not agree nor disagree	59	13.85
Disagree	75	17.61
Strongly disagree	186	43.66
Self decision to use any contraceptive method without consulting husband or sexual partner		
Strongly agree	81	19.01
Agree	43	10.09
Not disagree nor agree	44	10.33
Disagree	60	14.08
Strongly disagree	198	46.47

Table.4 Past contraceptive use among pregnant women and reason of discontinuation

Kind of contraceptive methods used prior to the current pregnancy	Number	Percentage
Bilateral tubal ligation and it failed	1	0.23
Pills	55	12.91
IUD	14	3.29
Depoprovera	96	22.54
Jadelle	49	11.50
Condoms	13	3.05
LAM	1	0.23
Standard Days Method (SDM)	38	8.92
Subtotal 1	267	62.67
Respondents who did not use any contraception fear of side effects.	2	0.47
Respondents who did not use any contraception with no clear reason	151	35.45
Respondents who did not use any contraception because of Religion believes	6	1.41
Subtotal 2	159	37.33
<i>Reason of contraception method discontinuation</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Wanted another child</i>	<i>172</i>	<i>40.38</i>
<i>Severe side effects</i>	<i>74</i>	<i>17.37</i>
<i>Not available at health facilities</i>	<i>2</i>	<i>0.47</i>
<i>Lack of enough information</i>	<i>2</i>	<i>0.47</i>
<i>Religion believes</i>	<i>2</i>	<i>0.47</i>
<i>Side effects</i>	<i>4</i>	<i>0.94</i>
<i>No use of contraceptive methods</i>	<i>151</i>	<i>35.45</i>
<i>Contraceptive methods failed</i>	<i>19</i>	<i>4.46</i>

Table.5 Plan for next pregnancy, Intent of post-partum contraceptive method use, time to start contraceptive methods in postpartum and source of family planning methods according to our respondents (n=426)

Time for next pregnancy	Frequency	Percentage
Within 2years	22	5.16
3years	65	15.26
>5years	160	37.56
I do not need another child	101	23.71
I do not know	78	18.31
Future Intent		
Bilateral tubal ligation	14	3.29
Never use any contraceptive method	21	4.93
Pills	35	8.22
IUD	61	14.32
Depoprovera	99	23.24
Jadelle	103	24.18
Condoms	20	4.69
Lactational amenorrhoea method (LAM)	3	0.70
Standard Days Method (SDM)	53	12.44
Any other method	17	3.99
Time to start contraceptive methods		
Within 6 weeks (1month and 2weeks) postpartum	132	30.99
Immediate in postpartum	120	28.17
Within six month after birth	38	8.92
By the time menses will return.	74	17.37
I do not know	62	14.55

These findings are different from results of studies from Nigeria as for them the most known family planning methods were Billings/safe period (Ikechebelu *et al.*, 2005; Tilahun *et al.*, 2013).

This study finds that there is a big problem on the knowledge of respondents on the knowledge of long-acting reversible contraceptive methods as 31.92% of them do not know them while 13.83% and 8.19% report to know Jadelle and IUD respectively and separately and only 1.88% of respondents know both long-acting contraceptive methods. These findings are different from those from two studies from Ethiopia on Long acting and Reversible Contraceptive methods where one study (Tilahun *et al.*, 2013) reveals that LAMPS were well known by women but another study in the same country reports a negative attitude towards practicing LAMPS (Alemayehu *et al.*, 2012) (Table 2).

Findings of this study show that most of respondents know the importance of modern family planning methods as 88.50% know at least two important use of family planning methods. And Birth spacing was reported by most of the respondents (334/426=78.4%) as importance of family planning followed by improving life of the mother and the baby (187/426=43.90%), 99/426=23.24% preventing unwanted pregnancy. Those findings are similar to those found in similar studies done in Nigeria and Ethiopia where they also reveal that birth spacing and limiting births were among other importance of family planning at a percentage of 72.9% and 40.6% respectively (National Institute of Statistics of Rwanda, 2010; National Institute of Statistics of Rwanda, 2014-2015; Gebremariam, 2014). Health facilities were reported by most of the respondents as the first source of information, followed by Community Health Workers and media respectively. Those findings are similar to those of various studies where mass media,

health facilities and health workers are among other source of information (Oluwasanmi *et al.*, 2011; Ferdous *et al.*, 2012; Dieudonné Ndaruhuye *et al.*, 2013; Ministry of Health, 2012).

In total 267 respondents (62.67%) over 426 respondents used modern contraceptive methods before getting the current pregnancy. Depoprovera, pills and Jadelle were the most used modern family planning methods respectively. As we consider this percentage as the prevalence of family planning methods use among pregnant women attending antenatal clinic in health facilities in Rwanda, we find that this rate is greater than the rate of 45% of contraceptive methods use in Rwanda from DHS 2010 and 47% in DHS 2014-2015 but those DHSs consider general population (National Institute of Statistics of Rwanda, 2010; National Institute of Statistics of Rwanda, 2014-2015). Pregnant women in Rwanda used Family Planning methods more compared to those in other studies where prevalence of contraceptive use was 25% for the study done in Nigeria and 43% in study done in Ethiopia (Igwegbe *et al.*, 2010; Ikechebelu *et al.*, 2005; Tilahun *et al.*, 2013) When we compare past contraceptive use among health facilities included in this study, we found the opposite of one could expect; pregnant women in referral hospitals (CHUK and CHUB) were less likely to use contraceptive methods in the past while pregnant women in District Hospitals and Health Centers were most likely to use various form of contraceptions ($p < 0.01$). This association can be explained by the fact that all modern Family Planning Methods were mainly given for free at Health Centers and also Community Health Worker are trained in giving some contraceptive methods at village level like pills and injectables from Rwanda Ministry of Health Program called CBP (Community Based Provision Program) introduced in 2011. From District Hospitals to

Referral Hospitals some price is applied for those receiving a contraceptive method there and moreover some of referral hospitals do not have Family Planning service apart (Ministry of Health, 2012).

Higher number of gravidity, higher number of living children, Occupation were found to be associated with the past contraceptive methods use ($p < 0.01$). Past family planning method use increased with the increase of gravidity and number of living children. Side effects, more children and husband or sexual partner decision were found to be associated with the no use of contraceptive ($p < 0.01$). The use of contraceptive methods is decreasing among pregnant women who reported severe side effects, among pregnant women who desired more children and among those pregnant women whose husband or sexual partner decides for them to use or not a family planning method. There was no significant association between Religion, level of education and the past contraceptive use among respondents ($p = 0.41$, $p = 0.14$). Those findings are similar to those of other studies done in other countries and even in Rwanda (Dieudonné Ndaruhuye *et al.*, 2013; Ministry of Health, 2012; Igwegbe *et al.*, 2010; Ikechebelu *et al.*, 2005; Tilahun *et al.*, 2013, Noone, 2004; Alemayehu *et al.*, 2012).

Findings of this study reveals that apart from 21 pregnant women (4.93%) who denied any modern contraceptive methods in post-partum and 17 pregnant women (3.99%) who reported to use any other method rather than modern contraceptive methods, 91.08% of pregnant women tend to use any form of modern contraceptive methods. This is a very strong intent as the Rwanda Ministry of Health target of contraceptive methods use in 2018 is 70% and it is very important to pregnant women to start thinking and planning the contraceptive methods to be used after delivery as it is associated with the decrease

of unintended pregnancy, improvement of maternal and child well being. And it should be discussed earlier in antenatal clinic (Huezo *et al.*, 1993; Koenig *et al.*, 1997; Brunie *et al.*, 2013). This study also reveals that the future intent of post-partum contraceptive methods use is mainly based on Jadelle, Depoprovera, and IUD use as they plan to use those methods at a rate of 24.18%, 23.24% and 14.32% respectively. While 3.29% of all respondents plan to use irreversible contraceptive methods (Bilateral tubal ligation). From those figures, pregnant women in Rwanda have an excellent intent of post-partum contraceptive methods use as a big number of them tend to use LARCs (IUD and Jadelle) and even irreversible contraceptive methods when it is known that those are the most effective contraceptive methods. It is also supported by the fact that when pregnant women are having positive attitude on LARCs as when they were asked about their effects on the uterus, 38.49% strongly disagreed the fact that LARCs can harm someone's uterus. Their attitude is different from those of other studies done in different countries including two studies done in Ethiopia (Gebremariam, 2014; Takele *et al.*, 2012). Higher number of gravidity and living children were associated with use of contraceptive methods in the future ($P = 0.04$). Pregnant women with one to three living children were most likely to use contraceptive methods in the future than those with no living child. There is an association between a Past contraceptive methods use with an intent of post-partum contraceptive methods use among pregnant women, as those who used any form of contraceptive methods are most likely to use it again in the future ($P < 0.001$). There is also an association between reason of family planning methods discontinuation with the intent of post-Partum contraceptive use. Pregnant women who stopped the past contraception as they wanted another child are most likely to use a

form of modern contraception, and those who reported to stop the method due to side effects are less likely to use it in the post-partum. Most of respondents know on almost equal proportion that contraception can be started immediately after delivery and within 6 weeks post-partum (28.17% and 30.99% respectively). While 17.37% of respondents know that contraception can be started by the time they resume menses, 14.55% of respondents do not know when to start contraception in post-partum. Pregnant women in referral hospitals are less likely to know exactly the best time to start contraception in post-partum than those in district hospitals and Health Centers ($P = 0.01$). These findings are similar to those of other studies like a study done by Noone, *et al.*, that revealed that women choose a method or methods to prevent pregnancy based on their knowledge, experience, and evaluation of what would be the best fit within the context of their current life situation. (Noone, 2004) Other studies highlight the importance of counseling, education and strong family planning programs, a wide range of available methods, informed choice of method, quick start procedure, easy access and good follow up services to be associated with continued and satisfied use of a method (Huezo *et al.*, 1993; Koenig *et al.*, 1997; Cotten *et al.*, 1992; Ali, 2001; Mohamed M. Ali, 2012; Brunie *et al.*, 2013; Ministry of Health, 2012; Mubita-Ngoma and Kadantu, 2010; Stechna *et al.*, 2013).

To the best of our knowledge, this is the first study in Rwanda to assess whether poor knowledge and negative attitudes of pregnant women inadvertently pose a barrier to widespread contraceptive use among them in particular and through the country in general. As our sample was chosen through systematic random sampling we cannot know if those pregnant women who did not participate in the study would give different answers or not

and again we used different data collectors with their different understanding when helping a respondent on questionnaire and here a bias in selection may occur. We are not sure if it is true when a respondent says she used or she will use a contraceptive methods.

This study can give a general picture on the knowledge, attitude and practice of family planning methods among pregnant women in Rwanda as we used six health facilities of different level of care (referral and district hospitals and Health centers), with different data collectors and data collection was done in different days of work and it included all socio-economic classes in Rwanda. Moreover there was no compensation for the participation.

There is a need of a large study in this area and especially on the knowledge, attitudes and practice of family planning methods among health professional in referral hospitals.

Severe side effects of contraceptive methods have to be addressed individually, couple education targetting husbands and sexual partners on family planning methods are needed and a study secondary to this one will be also good as it may show if really respondents use contraceptive methods they said they will use in post-partum.

Pregnant women in Rwanda have an excellent knowledge and attitude of available modern family planning but minimal use (62.7%) compared to Rwanda Ministry of Health target by 2018 (70%). Pills and injectables (Depoprovera) were reported to be known by most of respondents while emergency contraception was the last one to be known but their knowledge on LARCs (IUD and Jadelle) is still low. Being of health centers and district hospitals, age, number of number of living children, past contraceptive users

and occupation of the respondents are factors associated with contraceptive use while severe side effects of modern contraceptive methods, desire of more children and husband or sexual partner decision for their wife and the inability of women to decide themselves to use or not a family planning method are factors associated with no use of modern contraceptive methods.

Competing Interests

The authors declare that they have no competing interests.

Contribution to Authorship

HE conceived the idea, developed study protocol, participated in data collection at CHUK and KIBAGABAGA and statistical analysis and preparation of the article.

SR conceived the idea, provided expert guidance, and contributed to the editing of the article.

RG provided reviewed the protocol, gave expert guidance and contributed the preparation of the article.

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