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Effect of Family Planning Counseling After Delivery on Contraceptive Use at 24 Weeks Postpartum in Kinshasa, Democratic Republic of Congo

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Abstract
Introduction Unintended pregnancy during the postpartum period is common. The aim of this study was to describe contraceptive use among postpartum women and assess whether family planning counseling offered by health care providers during well-baby clinic visits increased use of modern contraceptive methods at 6 months following delivery. *Methods* Data comes from a cohort of women enrolled in a breastfeeding promotion trial in Kinshasa, Democratic Republic of Congo who reported being sexually active at 24-weeks post-partum. Modern contraceptive methods included intrauterine devices, injectables, implants, and contraception pills. Logistic regression models were used to estimate odd ratios (OR) and 95% confidence intervals (CI) for the impact of nurse counseling on use of modern birth control methods. *Results* Of 522 participants who reported being sexually active, 251 (48.0%) reported doing at least one thing to avoid pregnancy and were included in this analysis. Of these 251, 14.3% were using a modern contraceptive method, despite availability at the clinic. Discussion with a nurse about family planning was associated with increased odds of using modern birth control relative to other methods (OR 4.0, 95% CI 1.9, 8.6). *Discussion* Discussion of family planning with a nurse increased the odds of using a modern contraceptive among postpartum women. Integration of family planning counseling into postpartum services offers a potential avenue to increase modern contraceptive use among women with access.

Keywords Postpartum · Contraceptive use · Family planning counselling · Well-baby clinics · DR Congo

Significance

Recent evidence from low resource settings show that up to half of those who wished to delay or prevent a future pregnancy in postpartum had unmet need for family planning services. We found that less than half of sexually active women were using any form of contraceptive. Of those reporting contraceptive use, few used modern contraception. Postpartum women who reported having a discussion with a nurse regarding family planning at the well-baby visit were more likely to be using effective modern birth control. Together with other results, our study suggests integrated

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family planning counseling in postpartum follow-up is a simple strategy that can increase modern contraceptive use.

Introduction

Unintended pregnancies are pregnancies that are mistimed, unplanned or unwanted at the time of conception. Approximately 40% of all pregnancies worldwide are unintended (Sedgh et al. 2014). The postpartum period is an elevated at-risk period for unintended pregnancy since, most women wish to delay or prevent future pregnancies for up to a year following delivery (Ross and Winfrey 2001). A recent study using the Global Network for Women's and Children's Health Research's and involving over 36,000 postpartum women from 100 rural geographic clusters in 5 countries (India, Pakistan, Zambia, Kenya, and Guatemala), showed that at 6 weeks postpartum, less than 5% of these women wished to have another pregnancy within the year (Pasha et al. 2015). Yet half of those who wished to delay or prevent a future pregnancy had an unmet need for family planning services.

Short birth intervals are known to be associated with increased risk of poor perinatal outcomes including low birth weight, preterm birth, and newborn/infant mortality (Boerma and Bicego 1992; Conde-Agudelo et al. 2006; Kuate Defo 1997; Perin and Walker 2015). Prior work estimated that preventing unmet need for contraception could prevent 29% of all maternal deaths annually (Saifuddin Ahmed, Li, Liu, & Tsui). At the household level, a previous randomized controlled trial showed that improved access to family planning services is associated with improved women's earnings, assets, and children's schooling and body mass indexes (Canning and Schultz 2012).

Africa is the world's region with the lowest prevalence of contraception use (Alkema et al. 2013). Despite recent progress in the region regarding maternal and child mortality, the burden remains substantial. The Democratic Republic of Congo (DRC) is the largest and most populous country in Central Africa and accounts for a significant portion of under-five mortality in West and Central Africa (You et al. 2015) and has substantially short birth intervals (Chirwa et al. 2014; Kandala et al. 2014). An estimated 30% of mothers in DRC have less than 24 months between births (Chirwa et al. 2014). Analysis of the DRC's 2007 Demographic Health Surveys data showed that shorter birth intervals play a significant role in the observed high maternal and child death in the country (Kandala et al. 2014). Although the promotion of modern contraceptives has been traditionally integrated into prenatal care programs, even in Kinshasa, the capital city where utilization of well-baby services is high, there are no efforts to integrate family planning counseling into well-baby visits. Contraceptive counselling by a health provider during those visits has been recently shown to increase usage of contraceptives among postpartum women (Jarvis et al. 2018).

The aim of this study was to assess whether family planning counseling offered by health care provider during well-baby clinic visits increased use of modern birth control methods at 6 months following delivery in a cohort of sexually active breastfeeding women in Kinshasa, DRC.

Methods

Study Design and Population

This study is a cross-sectional, secondary analysis of data from a cohort of women enrolled in a breastfeeding promotion trial in Kinshasa, DRC (trial registration: NCT01428232). Between May 24 and August 25, 2012, all women who gave birth to a healthy singleton in one of the six health facilities selected for the original study, were enrolled if they intended to attend well-baby clinic visits in the respective facilities, and consented to be part of the study. Details on selection of facilities and the main result from the study have been reported elsewhere (Yotebieng et al. 2013, 2015; Zivich et al. 2018).

Measures and Variables Definition

At enrollment interviews, in addition to demographic and obstetrical history, participants were also asked whether the pregnancy that led to the delivery was intended or not and for those who reported unintended pregnancy, whether they wanted to have a baby later or did not want any more children. At 24 weeks, participants were asked if they had any sexual intercourse since delivery. Those who responded yes to this question were considered to be sexually active. Since women may have been using abstinence as birth control, only women who reported being sexually active at 24 weeks after the delivery interview were included in the analysis. Sexually active women were asked if they were using any method to delay or avoid pregnancy, and if yes, to specify which method they were using. Participants who reported doing something to delay or avoid getting pregnant were asked if a nurse in the health facility discussed contraceptive methods with them (nurse counseling). Nurse counseling was assessed via the following question, "did a nurse in this health structure discuss with you what contraceptive is appropriate for a breastfeeding mother like you?" As a result of the built-in skip pattern, our analysis of the impact of family planning counseling is limited to women who reported using some method to prevent pregnancy.

Three outcomes were considered for this analysis: modern contraceptive use (yes or no), condom use (yes or no),

or other contraceptive methods (yes or no). Participants who reported one of the following were classified as user of modern contraceptives: intrauterine device (IUD), injectables, implants, contraception pills, sterilization (male or female), diaphragm, or foam jelly. Use of condoms (either male or female) was analyzed as a separate variable. All other reported methods were grouped into a single category.

All covariates were measured at enrollment and include age (continuous), education level (less than primary education, primary education or higher), marital/relationship status (married/live-in boyfriend, never married/separated/divorced), previous children (none/at least one), not wanting additional children (yes/no), and socio-economic status (SES). SES was a wealth index score divided into quintiles. Principal component analysis (PCA) was used to reduce the dimensions of the multiple structural SES indicators and calculate summarization scores. To calculate SES scores, the average number of household members per room (indication of crowding), number of sleeping beds in household, household water source (communal or private pipe), cooking fuel type (electric stove or wood/charcoal), and ownership of durable assets (radio, refrigerator, mobile phone, television) were included in the PCA model. The first PCA component explained 20.2% of the variability between the above indicators of SES and was divided into quintiles.

Statistical Analysis

Logistic regression models were used to estimate odd ratios (OR) and 95% confidence intervals (CI) for the relation between each of the nurse counseling on family planning and birth control method categories independently. Generalized estimation equations were utilized to account for potential clustering at the clinic level. Confounders were identified a priori and included; age, education, marital status, previous children, wanting additional children, and SES. Nonlinearity was assessed for age through quadratic and cubic terms.

All analyses were conducted in SAS 9.4 (Cary, NC, USA). This study was approved by the Ohio State University Institutional Review Board and the Kinshasa School of Public Health Ethical Committee, and all women gave consent prior to inclusion in the study.

Results

Population Characteristics

Among the 855 participants included in the original trial with available data at 24 weeks postpartum, 522 (61.1%) reported being sexually active. Less than half of sexually active women (n = 251, 48.0%) reported doing something to avoid or delay pregnancy. Of women reporting action to avoid pregnancy, most had their first child as part of the study, were younger, and had not had their menstrual cycle return (Table 1).

Pregnancy Avoidance Practices

Of the 251 women included in the analysis, 99 (39.4%) reported using condoms, 36 (14.3%) reported using modern birth control methods, and 125 (49.8%) reported using other birth control methods (Fig. 1). Eight women reported using both modern birth control and other birth control methods. One woman reported using modern birth control and condoms. Male condoms were reported more often than female condoms (97.0% vs. 4.0%). Reported modern contraceptives included intra-uterine devices (IUD) (5.6%), implants (25.0%), injectables (22.2%), and oral contraceptive pills (50.0%). Other birth control methods included antibiotics/antiparasitics (9.6%), rhythm method (23.2%), withdrawal (59.2%), and other methods (3.2%).

Modern contraceptive methods were used more by older, higher educated, and multiparous women (Table 2). Women who reported modern contraceptive methods also wanted additional children compared to women using condoms or other methods. No modern contraceptive users were never married, separated, or divorced. About 10% of women who reported other, ineffectual, contraceptive methods reported not wanting additional children.

Nurse Counseling on Family Planning and Choice of Contraceptive Methods

Discussion with a nurse about family planning was associated with increased odds of using modern birth control, decreased odds of reporting the use of other birth control methods, and a negligible decrease in odds of reported condom use (Table 3). Due to the sparsity of data, adjustment was only feasible for age, education, and SES. Nurse counseling regarding family planning remained associated with increased odds of modern birth control (OR 4.0, 95% CI 1.9, 8.6), and a decreased odds of other birth control methods (OR 0.5, 95% CI 0.2, 1.2). No relation between nurse counseling and condom use was observed in the adjusted model (OR 1.0, 95% CI 0.4, 2.6).

Discussion

In our analysis of sexually active women accessing well-baby services in Kinshasa, about half reported doing at least one thing to delay or avoid pregnancy. Of those who reported doing at least one thing, a majority reported using ineffective contraceptive methods. Miscommunication is a possible explanation for the observation that women

Table 1 Maternal characteristics of sexually active 24-week post-partum women in Kinshasa, Democratic Republic of Congo (n = 522)

	Reported action to prevent pregnancy (n = 251)	Did not report any action to prevent pregnancy (n = 271)
Age (median, IQR)	27 (23, 32)	28 (24, 32)
Less than 20 years old	21 (8.4%)	15 (5.5%)
20–29	134 (53.4%)	149 (55.0%)
30+	96 (38.2%)	107 (39.5%)
Education		
Less than primary	170 (67.7%)	179 (66.1%)
Primary or higher	81 (32.3%)	92 (33.9%)
SES[a]		
Fifth	48 (19.3%)	62 (23.2%)
Fourth	55 (22.1%)	57 (21.3%)
Third	47 (18.9%)	50 (18.7%)
Second	51 (20.5%)	42 (15.7%)
First	48 (19.3%)	56 (21.0%)
Missing	2	4
Marital status		
Married/live-in boyfriend	233 (93.2%)	260 (95.9%)
Never married/separated/divorced	17 (6.8%)	11 (4.1%)
Missing	1	0
Previous births		
First birth	53 (21.1%)	43 (15.9%)
Second or subsequent birth	198 (78.9%)	228 (84.1%)
Wants additional children		
Yes	224 (89.2%)	235 (87.0%)
No	27 (10.8%)	35 (13.0%)
Missing	0	1
Menstrual cycle returned		
Yes	101 (40.9%)	182 (67.2%)
No	146 (59.1%)	89 (32.8%)
Missing	4	0

Data comes from women enrolled in a breastfeeding promotional trial in the DRC between May 24 and August 25, 2012. To be eligible, women had to have a singleton birth at study enrollment and consented to be part of the trial. Twenty-three women did not have a response to this question

IQR interquartile range, *SES* socio-economic status

[a]SES is wealth index score divided into quintiles. To determine the SES measure, the average number of household members per room (indication of crowding), number of sleeping beds in household, household water source (communal or private pipe), cooking fuel type (electric stove or wood/charcoal), and ownership of durable assets (radio, refrigerator, mobile phone, television) were included in principal component analysis. The first component explained 20.2% of the variability in the data

reported using antibiotics or antiparasitics, since this has not been previously reported to our knowledge. To understand these observations, it is important to remember that these women were attending monthly well-baby visits in health facilities with modern contraceptives available on-site. Previous work in Kinshasa has indicated that providing free contraception in the postpartum period increases its uptake (Jarvis et al. 2018). However, low utilization despite access has also been previously been described in Kinshasa. In a survey of health facilities in Kinshasa conducted during 2012 and 2013, researchers found that lack of physical access was not the defining reason for low contraceptive use (Kayembe et al. 2015). In a follow-up study using focus groups, fear of side effects (especially sterility) and lack of information or misinformation were among key barriers to modern contraceptive use (Muanda et al. 2016). Fear of side effects and lack of information on contraceptive as barrier to adoption of modern contraceptives has also been reported in eastern Congo (Mathe et al. 2011). Our finding that discussion with a nurse about family planning increased the odds of effective modern contraceptive use is supported by the importance of misinformation as a barrier. Our results align

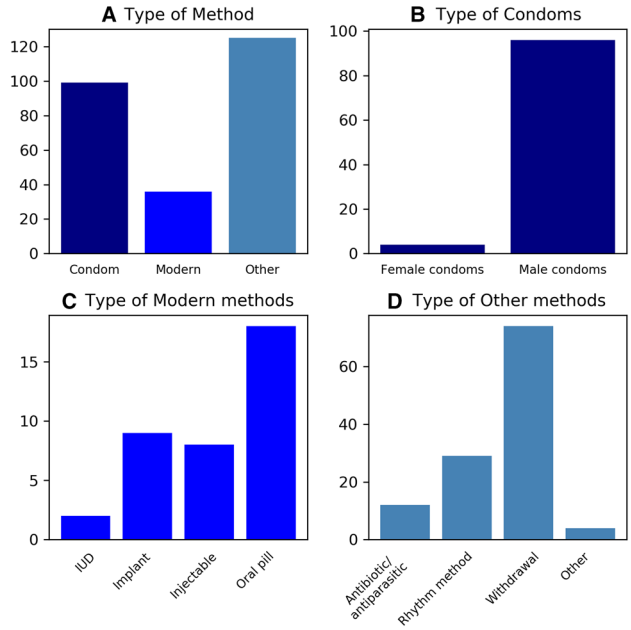

Fig. 1 Types of contraception used among 251 sexually active women who reported action to prevent pregnancy from six clinics in Kinshasa, Democratic Republic of Congo. *Cohort of women enrolled in a breastfeeding promotional trial in the DRC between May 24 and August 25, 2012. To be included women had to have a singleton birth at study enrollment and consented to be part of the trial. **a** Distribution of type of contraceptive method reported by the 251 women. **b** Distribution of female and male condoms among 99 who reported using condoms. **c** Distribution of type of methods among 36 women who reported using a modern contraceptive method. **d** Distribution of types of method used among 125 who reported using a method other than modern contraceptive or condoms

with recent work demonstrating that educating clinic staff and integrating referral tools can further increase modern contraceptive use over free access alone (Jarvis et al. 2018).

Antenatal counseling has not been observed to have a substantial effect on uptake of modern contraceptives in African settings (Ayiasi et al. 2015; Keogh et al. 2015). In a community-based intervention in Bangladesh, training of community health workers to provide integrated family planning counseling and services during home visits along with maternal and child health services increase contraceptive use by 15% at 12 months postpartum (Ahmed et al. 2015). Another study found that implementation of a package of instructions to healthcare staff to initiate conversations about family planning with all eligible women and to actively propose family planning during curative and under-fives consultations in rural health centers in Niger was followed by marked increases in family planning uptake (Bossyns et al. 2002). A systematic review found that integration of family planning into other healthcare services is likely to be beneficial, but concluded that further studies are needed (Kuhlmann et al. 2010). In light of others' and our results, well-baby clinic visits provide an effective opportunity to provide postpartum women with information regarding modern contraceptives at a time they are most in need.

While we interpreted our findings as causal, there are substantive limitations to our interpretation. The major limitation of our study is how the information on nurse counseling was collected. Discussion with a nurse was self-reported by participants at 24-weeks (susceptible to recall bias) and counseling may have occurred after modern contraception was started. No information was collected regarding who initiated the conversation or the content of the conversation. While evidence indicates that family planning counseling increases the use of modern contraceptive during the postpartum period (Barber 2007), women may have initiated the discussion with a nurse because they previously decided to use modern contraception. Another major limitation is that due to the original survey design, the analytic sample was restricted to sexually active women who reported doing something to avoid or delay pregnancy. Although this restriction is a good proxy for women with potential unmet need for contraceptives, providing contraceptives to women who might be abstaining or not doing anything to avoid pregnancy with information on modern contraceptives may alter their behavior as well. Additionally, women who were lost to follow-up before 24-weeks may have responded differently to nurse counseling about family planning or their contraceptive choices. Lastly, residual confounding in our estimates in likely. Due to the sparsity of data, our adjustment was reduced to only age, education, and SES. One important confounder we were unable to account for was male partners' role regarding contraception choice. Previous research has shown influence of male partners in contraception decisions (Morse et al. 2014; Muanda et al. 2017; Orji et al. 2007; Sano et al. 2018). The limitations of our study could be addressed in future work by using a well-defined family planning intervention, prospectively following women after the discussion with a nurse, and studying a less restricted study population. Ideally, studies would follow women over a 2-year period to determine the long-term impact of improved family planning counseling.

Conclusion

At 6 months postpartum, most sexually active women were not using any contraceptive in our study. Of women who reported using some form of contraception, few were using modern contraception, despite availability at their clinic. Reporting having discussed family planning with a nurse during well-baby clinic visits substantially increased odds of using modern birth control. In light of previous work and our results, integration of family planning counseling

Table 2 Contraceptive methods among sexually-active who reported trying to avoid or delay pregnancy at 24-weeks post-partum in Kinshasa, Democratic Republic of Congo (n = 251)

	Modern[a] (n = 36)	Condom[a] (n = 99)	Other[a] (n = 125)
Nurse counseling[b]			
Yes	13 (38.2%)	13 (14.1%)	11 (10.0%)
No	21 (61.8%)	79 (85.9%)	99 (90%)
Missing	2	7	15
Age (median, IQR)	28 (24, 34)	26 (22, 32)	27 (24, 32)
Less than 20 years old	3 (8.3%)	9 (9.1%)	9 (7.2%)
20–29	18 (13.4%)	52 (52.5%)	71 (56.8%)
30+	15 (41.7%)	38 (38.4%)	45 (36.0%)
Education			
Primary or less	22 (61.1%)	66 (66.7%)	85 (68.0%)
Secondary or higher	14 (38.9%)	33 (33.3%)	40 (32.0%)
SES[c]			
Fifth	7 (20.6%)	19 (19.2%)	27 (21.6%)
Fourth	8 (23.5%)	20 (20.2%)	28 (22.4%)
Third	8 (23.5%)	20 (20.2%)	21 (16.8%)
Second	7 (20.6%)	20 (20.2%)	25 (20.0%)
First	4 (11.8%)	20 (20.2%)	24 (19.2%)
Missing	2	0	0
Marital status			
Married/live-in boyfriend	36 (100%)	90 (90.9%)	114 (91.9%)
Never married/separated/divorced	0 (0%)	9 (9.1%)	10 (8.1%)
Missing	0	0	1
Previous births			
First birth	6 (16.7%)	26 (26.3%)	24 (19.2%)
Second or subsequent birth	30 (83.3%)	73 (73.7%)	101 (80.8%)
Wants additional children			
No	2 (5.6%)	12 (12.1%)	13 (10.4%)
Yes	34 (94.4%)	87 (87.9%)	112 (89.6%)
Menstrual cycle returned			
Yes	25 (69.4%)	52 (54.2%)	75 (60.5%)
No	11 (30.6%)	44 (45.8%)	49 (39.5%)
Missing	0	3	1

Nurse counseling Birth control methods add up to more than 251, since eight women reported using both condoms and other methods and one woman reported using modern birth control with other methods

IQR interquartile range, *SES* socio-economic status

[a]Modern birth control methods included; intra-uterine device, implants, injectable, and oral contraceptive pills. Condoms included both male and female condoms. Other birth control methods included rhythm method, withdrawal, antibiotics/antiparasitics, and other. Other birth control methods are considered ineffectual

[b]Nurse counseling on family planning was collected via the following question, "Did a nurse in this health structure discuss with you what contraceptive is appropriate for a breastfeeding mother like you?". This question was only asked for women who reported action to prevent pregnancy

[c]SES is wealth index score divided into quintiles. To determine the SES measure, the average number of household members per room (indication of crowding), number of sleeping beds in household, household water source (communal or private pipe), cooking fuel type (electric stove or wood/charcoal), and ownership of durable assets (radio, refrigerator, mobile phone, television) were included in principal component analysis. The first component explained 20.2% of the variability in the data

in well-baby clinic visits has promise regarding the uptake of modern contraceptives among postpartum women in low resource settings, like DRC.

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Table 3 Relation between nurse counseling on family planning and type of contraceptive used among sexually active women who reported trying to avoid or delay pregnancy at 24-weeks post-partum in Kinshasa, Democratic Republic of Congo

	OR	95% CI
Modern birth control methods		
Bivariate[a]	4.9	2.1, 11.1
Multivariate model[b]	4.0	1.9, 8.6
Condom		
Bivariate[a]	0.8	0.3, 2.6
Multivariate model[b]	1.0	0.4, 2.6
Other birth control methods		
Bivariate[a]	0.5	0.2, 1.0
Multivariate model[b]	0.5	0.2, 1.2

OR odds ratio, *95% CI* 95% confidence interval

Modern birth control methods included; intra-uterine device, implant, injectable, or oral contraceptives. Condoms included both male and female condoms. Other birth control methods included; rhythm method, withdrawal, antibiotics/antiparasitics, and other methods

[a]Bivariate model was modeled using generalized estimation equation to account for unknown correlation with clinic attended

[b]Multivariate model was modeled using generalized estimation equation to account for unknown correlation with clinic attended. Confounders adjusted for were age, education, and socio-economic status

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