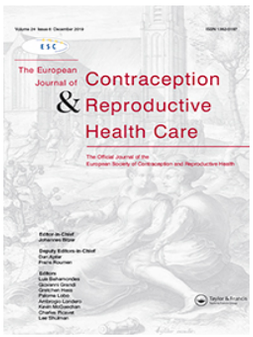

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RESEARCH ARTICLE

Predictors of contraceptive implant uptake in the immediate postpartum period: a cross-sectional study

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ABSTRACT

Objectives: The aim of the study was to investigate how to improve access to family planning and address unmet contraceptive need in postpartum women, by determining the predictors of contraceptive implant uptake in the immediate postpartum period.

Methods: A descriptive cross-sectional study was conducted among women who had given birth up to 6 d earlier at the Riley Mother and Baby Hospital, which is part of the Moi Teaching and Referral Hospital in Eldoret, Kenya. Participants were systematically sampled and data collected using pre-tested interviewer-administered questionnaires. Statistical analyses were performed to determine associations between variables. Logistic regression was used to determine the relationship between variables and contraceptive implant uptake.

Results: The study comprised 353 women. Most (92%) were Christians and were married (74%). More than 76% had received secondary education or above; 9% were HIV-positive. Most (87%) had heard of the contraceptive implant and almost half (46%) had ever used it before their current pregnancy. Older women ($p = .036$), those who had reached their desired family size ($p = .003$), those who had planned for the current pregnancy ($p = .027$), those who had used the implant before ($p < .001$) and those who were HIV-positive ($p = .001$) were more likely to agree to use the contraceptive implant.

Conclusions: Older age, achievement of family size, previous use of the same method, HIV positivity and planned pregnancy positively predicted uptake of the contraceptive implant.

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Family planning; immediate postpartum; predictors; subdermal contraceptive implant

Introduction

The contraceptive implant is a long-acting reversible contraceptive (LARC) method and is one of the most effective family planning methods. With typical use, the pregnancy rate is 0.05% and it has the highest LARC continuation rate of 81.7% in the first year of use [1]. It is safe to use while breastfeeding and is recommended for use in the immediate postpartum period as it offers immediate protection [2].

In 3 years of use, less than one pregnancy per 100 Implanon users can be expected. For Jadelle, the cumulative pregnancy rate at the end of 5 years is 1.1 per 100 users. For Sino-implant (II), the cumulative pregnancy rate at the end of 4 years is 0.9–1.06% [3]. These efficacy rates are comparable to those of other LARC and permanent contraceptive methods, including the intrauterine device (IUD) and female and male sterilisation. Nevertheless, only 10% of married women in Kenya use a contraceptive implant [4]. In Kenya, almost 18% of married women aged 15–49 have an unmet need for family planning: 9% for spacing births and 8% for limiting births [4].

Research indicates that promotion of family planning in countries with high birth rates has the potential to reduce poverty and hunger and avert 32% of all maternal deaths and nearly 10% of childhood deaths [5], as well as contribute substantially to women's empowerment, achievement of universal primary schooling and long-term environmental sustainability [6], leading to improved quality of life for the entire community.

The immediate postpartum is a good time to insert an IUD or implant. It is presumed that women who have recently given birth are often highly motivated to use contraception, they are known not to be pregnant, and the hospital setting offers convenience for both patient and health care provider. In addition, women are at risk of unintended pregnancy in the period immediately after delivery, as shown by a study in which women were instructed to abstain from sexual intercourse until 6 weeks postpartum, but 45% of participants reported unprotected sex before that time [1,7].

Studies have shown that breastfeeding women are unlikely to conceive before 6 weeks postpartum, but a US study demonstrated that 8% of newly postpartum women who were planning to breastfeed at the time of their discharge from hospital never did so, and another 22% discontinued breastfeeding before the sixth week [8]. Thus, early contraception in the postpartum period may avoid unintended pregnancies and the health risks associated with unplanned pregnancy, as empirical studies have argued that the risk of unwanted pregnancies and unmet need during this period is high [4].

The risk of unwanted pregnancy is high during the year following the birth of a child [9]. An analysis across 27 countries of Demographic and Health Survey data from

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Table 1. Sociodemographic characteristics of study participants (n= 353).

Sociodemographic characteristic	n (%)
Religion	
Christian	325 (92.1)
Muslim	27 (7.6)
Other	1 (0.3)
Marital status	
Single	71 (20.1)
Married	261 (73.9)
Widowed	12 (3.4)
Divorced/separated	9 (2.5)
Level of education	
None	9 (2.5)
Primary	74 (21.0)
Secondary	152 (43.1)
Tertiary	118 (33.4)
Main source of income (n = 349)	
Trading	102 (29.2)
Salaried employment	72 (20.6)
Casual employment	64 (18.3)
Farming	64 (18.3)
Other	47 (13.5)

Table 2. Reproductive health characteristics of study participants.

Reproductive health characteristic	Sample size (n)	Value
No. of pregnancies, median (IQR)	352	2 (1–3)
No. of children, median (IQR)	352	2 (1–3)
Boys, median (IQR)	338	1 (1–2)
Girls, median (IQR)	318	1 (0–2)
No. of children desired, median (IQR)	347	3 (3–4)
When to have next child, n (%)	353	–
<1 year	–	13 (3.7)
1–2 years	–	58 (16.4)
>2 years	–	158 (44.8)
Never	–	124 (35.1)
Mode of delivery of current child, n (%)	353	–
Spontaneous vaginal delivery	–	256 (72.5)
Caesarean section	–	97 (27.5)
Outcome of current pregnancy, n (%)	349	–
Live birth	–	328 (94.0)
Stillbirth	–	21 (6.0)

1993 to 1996 concluded that two-thirds of women who were within 1 year of their last birth had an unmet need for contraception: nearly 40% said that while they were not currently doing so, they did plan to use a method in the next 12 months [10]. Postpartum contraception is not only determined by demographic and socioeconomic factors but also by the length and intensity of breastfeeding, postpartum abstinence and postpartum amenorrhoea, among many factors [9].

The aim of this study was to identify factors that influence the uptake of contraceptive implants in the immediate postpartum period, so as to improve uptake as well as inform policy on the period during which contraceptives can be introduced postpartum.

Methods

This descriptive cross-sectional study was undertaken at the Riley Mother and Baby Hospital (RMBH), which is part of the Moi Teaching and Referral Hospital (MTRH) in Eldoret, Kenya. MTRH is Kenya's second national teaching and referral hospital and is located in Uasin Gishu County in the North Rift area of western Kenya, with a population of approximately 20 million. Study participants were women who had given birth at the RMBH up to 6 d earlier and were eligible for immediate postpartum contraception. Approval to undertake the study was granted by the MTRH ethics committee.

Data were collected over a period of 4 months using pre-tested interviewer-administered questionnaires. Using the delivery register at the RMBH, mothers who met the inclusion criteria were assigned numbers from one upwards according to the number of deliveries the previous day. A researcher (RM) prepared slips of paper corresponding to the number of deliveries that day. Four slips were then picked randomly without replacement. The mothers whose names corresponded to the selected numbers were then approached and, if they consented, were interviewed. If a mother declined to participate, the researcher selected another mother from the slips of paper as a replacement. The procedure was repeated for each day of data collection.

Women who consented to participate in the study (n = 353) were counselled on all methods of contraception. A subdermal implant was inserted in all women who consented and the rest were referred to the family planning clinic.

Fisher's exact test was used to calculate the sample size with an alpha level at 95%, assuming a contraceptive prevalence rate of 39% for any modern method in Kenyan women of reproductive age [5] and a precision level of 0.05. The sample size was then adjusted for the target population, since it was less than 10,000; the final sample size required was 350.

Data analysis was done using Stata software, version 12 SE (StataCorp, College Station, TX). Categorical variables were summarised as frequencies and corresponding percentages. Continuous variables that assumed Gaussian distribution were summarised as the mean and standard deviation (SD), while variables that violated the assumptions of normality were summarised as the median and corresponding interquartile range (IQR). Normality assumptions were assessed using the Shapiro–Wilk and Shapiro–Francia tests for normality. The association between categorical variables was assessed, used in Pearson's χ^2 test. Fisher's exact p-value was reported whenever the expected cell count of at least one cell in created 2×2 tables was <5. The association between binary variables and continuous variables was assessed using the two-sample t test if the continuous variable was normally distributed. If the continuous variable was skewed, the two-sample Wilcoxon rank-sum test was used. The Andersen model of health service use was used in relating predictors of contraceptive implant uptake.

Results

Participants

The sociodemographic profile of the 353 women interviewed is shown in Table 1. The mean age of the participants was 27 years (SD 5) and their average monthly income was USD 120 (IQR 50–210). Each participant had had a median of two pregnancies (IQR 1–3); 276 (90.5%) reported that they had never miscarried, 24 (7.9%) had had one miscarriage, four (1.3%) had had two miscarriages and one (0.3%) had had six miscarriages. Other participant characteristics are shown in Table 2.

Factors influencing uptake of contraceptive implant

Compared with single, widowed, separated or divorced women, uptake of the contraceptive implant was high among married women ($p = .008$). There was no association between implant uptake and level of education ($p = .936$) or source of income ($p = .378$). Women who agreed to use the contraceptive implant were significantly older than those who declined (mean age 27 [SD 5] *vs.* 26 [SD 5]; $p = .036$). Although the median average income was not significantly different between the two groups ($p = .320$), those who agreed to use the contraceptive implant had a higher median average monthly income compared with those who declined (USD 150 [IQR 50–210] *vs.* USD 100 [IQR 50–200]) (Table 3).

Participants who reported that they did not want to have more children were more likely to accept the contraceptive implant compared with those who wanted another child after 2 years ($p = .003$). There was no significant association between contraceptive implant uptake and mode of delivery, pregnancy outcome and awareness of family planning ($p = .835$, .304 and .379, respectively) (Table 4). Those who reported that they used contraception to enable spacing of children were more likely to accept the contraceptive implant compared with those who gave other reasons ($p = .041$). Those who had planned for the current pregnancy were more likely to accept the contraceptive implant compared with those whose pregnancy had been unplanned ($p = .027$). And those who intended to use family planning in the future were more likely to accept the contraceptive implant ($p < .001$).

Women who reported that they had used a contraceptive implant before were more likely to use it compared with those who had not ($p < .001$). Those who reported that they were HIV-positive were more likely to accept the contraceptive implant compared with those who reported that they were HIV-negative ($p < .001$) (Table 4).

Logistic regression showed that age and parity were not significant predictors of uptake of the postpartum contraceptive implant (Table 5). Those who were married were 55% more likely to accept the contraceptive implant compared with those who were single, widowed, separated or divorced (adjusted odds ratio [AOR] 0.55; 95% confidence interval [CI] 0.32, 0.95; $p = .031$). Christians were more than four times likely to accept the contraceptive implant compared with Muslims (AOR 4.41; 95% CI 1.54, 12.67; $p = .006$). Similarly, those who had previously used a contraceptive implant were more than three times more likely to agree to it now (AOR 3.60; 95% CI 2.22, 5.86; $p < .0001$).

Discussion

Findings and interpretation and differences and similarities in relation to other studies

The uptake of family planning is influenced by various factors such as age, education, contraceptive counselling, contraceptive availability, health care provider attitudes and sociocultural issues. We found that educational level was not associated with contraceptive implant uptake ($p = .936$), in agreement with the findings of a similar Kenyan study [11]. Other studies, however, showed that women who had a tertiary education were more likely to use contraception than those who had not ($p = .047$ and .03) [12,13]. The latter finding could be attributed to the fact that those studies looked at contraception in general, while our study looked specifically at the contraceptive implant.

Similar to another African study [12], our study found that women who said they had achieved their desired family size were more likely to accept the contraceptive implant ($p = .003$). This may be because it is a LARC method that can be used as an alternative to sterilisation.

We found that previous use of a contraceptive implant was associated with postpartum uptake ($p < .001$), which was also shown in a Ugandan study ($p < .001$) [14]. This may be because those who have already used the implant understand its advantages and wish to maintain it as their method of choice.

We found that women who were HIV-positive were more likely to accept the contraceptive implant compared with those who were HIV-negative ($p < .001$). This finding differs from that of another Kenyan study, where those who were HIV-negative were more likely to use the contraceptive implant compared with those who were HIV-positive ($p = .047$) [11]. Our finding may be because HIV-positive mothers felt they needed to avoid having more children, owing to a fear of infecting them. It might also have been because of the information provided during prevention of mother-to-child transmission sessions regarding the need for contraception.

We found that married women were 55% more likely to agree to use the contraceptive implant compared with single, widowed, separated or divorced women. This could be attributed to the assumption that those who were married were more aware of their fertility needs compared with those who were not.

Users' attitudes about side effects are strongly influenced by the quality of information and counselling provided. Evidence indicates that proper pre-insertion counselling can help women accept side effects and, as a result, reduce early method discontinuation [15]. Health care providers should address not only menstrual changes but also the possibility of infection at the insertion site, the fact that implants do not protect against HIV or other sexually transmitted infections and other contraceptive options.

Although it could be reasonably assumed that decreasing the distance women have to travel to access family planning services would increase the use of such services, research suggests that distance is not the only important factor. Evidence suggests that access to services involves more than just the distance that individuals have to travel to reach their nearest family planning clinic (geographical/physical accessibility); it may also include economic accessibility (whether the cost of travel to the nearest clinic or the cost of contraceptives is affordable), administrative accessibility (whether unnecessary rules inhibit use of services, e.g., restrictive opening hours), cognitive accessibility (whether individuals know about the services) and psychosocial accessibility (whether clients are constrained by psychosocial factors, such as perceived stigma in accessing services) [16].

A Mexican study found that women who received family planning advice during prenatal care were more likely to

Table 3. Association between sociodemographic characteristics of study participants and contraceptive implant uptake.

Sociodemographic characteristic	Sample size (*n*)	Contraceptive implant uptake: No (*n*= 197, 55.8%)	Contraceptive implant uptake: Yes (*n*= 156, 44.2%)	*p* Value
Marital status, *n* (%)	353	157 (79.7)	105 (67.3)	.008
Level of education, *n* (%)	353	151 (76.6)	119 (76.3)	.936
Source of income, *n* (%)	349	72 (36.5)	64 (41.0)	.378
Age, in years, mean (SD)	352	26 (5)	27 (5)	.036[a]
Average monthly income, in USD, median (IQR)	296	100 (50–200)	150 (50–210)	.320[b]

[a]Two-sample test.
[b]Two-sample Wilcoxon rank-sum test.

Table 4. Association between pregnancy-related characteristics of study participants and contraceptive implant uptake.

Pregnancy-related characteristic	Sample size (*n*)	Contraceptive implant uptake: No (*n*= 197, 55.8%)	Contraceptive implant uptake: Yes (*n*= 156, 44.2%)	*p* Value
Plan to have another child, *n* (%)	353	56 (28.4)	68 (43.6)	.003
Mode of delivery of the current child, *n* (%)	353	142 (72.1)	114 (73.1)	.835
Pregnancy outcome, *n* (%)	349	181 (91.9)	147 (94.2)	.304
Awareness of family planning, *n* (%)	351	190 (96.4)	152 (97.4)	.379[a]
Understanding of why family planning is practised, *n* (%)	352	–	–	–
Birth spacing	–	160 (81.2)	141 (90.4)	.041[a]
Attained desired family size	–	32 (16.2)	12 (7.7)	
Other reasons	–	4 (2.0)	3 (1.9)	
Wanted to be pregnant, *n* (%)	353	136 (69.0)	124 (79.5)	.027
Wanted to wait for some time before becoming pregnant, *n* (%)	353	181 (91.9)	150 (96.2)	.099
Did not want to be pregnant, *n* (%)	353	7 (3.6)	4 (2.6)	.595
Intention to use contraception in the future, *n* (%)	352	172 (87.3)	155 (99.4)	<.001
Previous use of implant, *n* (%)	352	64 (32.5)	97 (62.2)	<.001
HIV-positive, *n* (%)	345	6 (3.0)	25 (16.0)	<.001
Parity, median (IQR)	352	2 (1–3)	2 (2–4)	.005[b]
No. of children, median (IQR)	352	2 (1–3)	2 (1–4)	.003[b]
Boys	338	1 (1–2)	1 (1–2)	.094[b]
Girls	318	1 (0–2)	1 (1–2)	.022[b]
No. of children desired, median (IQR)	347	3 (3–4)	3 (3–4)	.258[b]

[a]Fisher's exact test.
[b]Two-sample Wilcoxon rank-sum test.

Table 5. Logistic regression analysis of factors associated with contraceptive implant uptake.

Factor	Unadjusted model: UOR (95% CI)	Unadjusted model: *p* Value	Adjusted model: AOR (95% CI)	Adjusted model: *p* Value
Age	1.05 (1.00, 1.09)	.047	0.99 (0.93, 1.06)	.827
Parity	1.20 (1.04, 1.39)	.014	1.15 (0.93, 1.41)	.198
Married[a]	0.52 (0.32, 0.85)	.009	0.55 (0.32, 0.95)	.031
Religion[b]	3.80 (1.40, 10.27)	.009	4.41 (1.54, 12.67)	.006
Previous use of implant	3.48 (2.24, 5.40)	<.0001	3.60 (2.22, 5.86)	<.0001
HIV infection	6.14 (2.44, 15.38)	<.0001	5.29 (2.01, 13.88)	.001

UOR: unadjusted OR
[a]Married *vs.* single, widowed, separated, divorced.
[b]Christian *vs.* Muslim.

use a contraceptive postpartum compared with those who did not (OR 2.2) [17]. Furthermore, women living in communities with high-quality care were more likely to use contraception compared with those in communities with lower quality of care (OR 1.4). In addition, women who had a higher number of prenatal clinic visits were more likely than those with fewer prenatal visits to use contraception after delivery; in absolute terms, the effect was equivalent to a 4% increase in odds with each additional visit. Institutional delivery was an important predictor. Women delivering in government or private facilities were more likely to use a contraceptive postpartum (OR 1.9) compared with women who delivered at home (OR 3.1). As expected, the odds of contraceptive use were positively associated with household wealth (OR 1.3), being married (OR 1.9) and older age of the infant (OR 1.1) [17].

A Nigerian study found that women who had had antenatal or postnatal counselling were significantly more likely to use contraception than those who had not (both $p < .001$). Other variables significantly associated with contraceptive use were parity, infant feeding method, reproductive goal and tertiary education (all $p < .05$) [12].

A Nigerian study on the intended postpartum use of contraceptives reported that, while the prevalence of previous contraceptive use was 35.5%, 54% of participants intended to use contraception after delivery [13]. Older age and high parity significantly predicted intention to use postpartum contraception ($p = .02$ and .01, respectively). A high level of education and receipt of contraceptive counselling also increased the intention to use postpartum contraception ($p = .03$ and .01, respectively).

As the demand for contraception fluctuates over the course of a woman's reproductive life, the timing of service delivery must be considered as part of any integration effort. The postpartum period is particularly important because appropriate birth spacing can improve maternal and infant health. Moreover, the demand for effective contraception may be high immediately after delivery; cross-sectional studies have reported positive associations between maternal and child health service use and subsequent contraceptive use [18]. In addition, prenatal services offer the opportunity to reach women who would be the primary target of family planning services.

Studies have shown that making contraception available in the postpartum period leads to a higher prevalence of contraceptive use. A study compared a cohort of women who were offered counselling and reversible contraceptive methods, including the IUD, in one ward at a hospital in

Peru with a cohort of women in a different ward who were discharged without being offered comparable services [19]. Six months after delivery, 82% of women who had been offered contraception were using it (40% were using an IUD), compared with 69% of women who had not been offered contraception (27% were using an IUD).

Half of married women worldwide now use a modern method of contraception, but globally 200 million women still have an unmet need (i.e., they would like either to stop having children or to delay their next birth for at least 2 years but are not using an effective contraceptive method). Unmet need is fuelled by a lack of information, fear of social disapproval or partner opposition, as well as concern about contraceptive side effects or impact on health. Unmet need can be considerably reduced by expanding access to currently underused methods and by assuring women that a variety of modern methods are available to meet their diverse needs [20].

Using the 2003 Egypt Demographic and Health Survey, Afifi [21] assessed the association of exclusive breastfeeding and amenorrhoea with the use of modern contraceptive methods among nursing mothers of children under 2 years old. The study found that amenorrhoea, exclusive breastfeeding and having a wanted child decreased the likelihood of modern contraceptive use, whereas higher education, urban residence and a positive attitude towards contraception increased its likelihood. Other Demographic and Health Survey analyses in Kenya, Indonesia, the Dominican Republic and Peru have demonstrated that the likelihood of initiating postpartum contraception increased with exposure to the media, level of education, wealth status and place of delivery [9]. A study in rural Vietnam found that age, knowledge about contraceptives and husband/partner opinion significantly affected the contraceptive decision [22].

In many parts of the world, women and girls often fear punishment – including violence by their partner or family – or stigma if they try to use contraception. Many cannot afford to pay for contraception or for transportation to reach a family planning clinic, or are unable to take time away from their family, work or school to use family planning services even when they are available [5]. These obstacles must be overcome if the contraceptive needs of women are to be met.

An Ethiopian study reported that the reasons given by married women for not using long-acting and permanent contraceptive methods included: use of another contraceptive method (93.3%), development of side effects (3.9%), refusal of permission by the husband (1.6%), medical reasons (11.4%) and non-availability of the service (1.3%) [23]. Another African study indicated that the reasons for non-contraceptive use included personal objection, which was related to issues of acceptability such as concerns about side effects (15.1%) and future fertility (10.2%) [12].

Study limitations

As this was a hospital-based study, it may be difficult to extrapolate the findings to the wider population of postpartum women.

Relevance of the findings: implications for clinicians and health care providers

Our findings point to possible missed opportunities for promoting healthy birth spacing and reducing unintended pregnancies. Women who have not received prenatal care, for example, might benefit from more consultation about postpartum contraceptive options. This population likely does not routinely access preventive health care services. Therefore, for these women, the period after delivery and before hospital discharge might constitute an especially opportune time for health care providers to promote the use of effective postpartum contraception and adequate birth spacing.

The period during and after pregnancy might be the only time that many women receive formal health care. It is, therefore, important not to miss this opportunity to provide family planning services, by widening access to services and improving the availability of trained health care professionals during the postpartum period.

Consideration should be made to offer family planning, especially the contraceptive implant, to all women during the postpartum period so as to increase the contraceptive prevalence rate among women of reproductive age. This would lead to a decrease in the number of unintended pregnancies in Kenya and hence reduce the number of abortions and the maternal mortality ratio.

Unanswered questions and future research

Further studies are needed to validate our findings and investigate the contribution of individual factors to contraceptive implant uptake in the immediate postpartum period. Health care provider capacity and willingness to meet the need for contraception in this period should also be explored.

Conclusion

Older age, achieved family size, previous use of the same method, HIV positivity and planned pregnancy positively affect uptake of the contraceptive implant. The immediate postpartum period is an opportune moment to introduce mothers to available methods of contraception and therefore increase the likelihood of more women embracing family planning.

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Disclosure statement

The authors declare no conflict of interest.

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