

Mobile Telephony Intervention Improves Contraceptive Acceptability and Clinic Attendance among Postpartum Patients in Mumbai, India

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ABSTRACT

Background: The relevance of postpartum women attending contraceptive clinics should be emphasized in efforts to increase postpartum contraception use. The impact of communication-balanced interventions using appointment cards and mobile telephony on increasing contraceptive acceptability among postpartum women was studied.

Materials and methods: Two hundred postpartum women given routine appointment cards for contraceptive counseling were randomly allocated to two groups: control (no reminders) and interventional (appointment cards + text message reminders). These women were pursued to determine the percentage from the control and interventional groups who attended the contraceptive clinics. Their socio-demographic profile, contraceptive choices, and effectiveness of contraceptives were recorded.

Results: Results showed that only 4% of those in the control group visited the contraceptive clinic, compared to 20% of those in the interventional group (those who received text messages). The women's top choices for contraception include the intrauterine device (IUD), progesterone-only pill (POPs), and deoxy-progesterone acetate. Contraceptive techniques were chosen by all the women who attended clinics, as opposed to just 44% of the women who did not.

Conclusion: This study has identified the impact of communication interventions to increase the acceptability of contraceptive methods among postpartum women. Interventions delivered by mobile phone were effective as compared to routine appointment cards to motivate postpartum women to attend contraceptive clinics.

Clinical significance: Communication-balanced interventions boosted contraceptive clinic attendance and acceptance among postpartum women. Therefore, efforts should be focused on educating postpartum women on the necessity of attending contraceptive clinics.

Keywords: Communication intervention, Contraception, Counseling, Postpartum women.

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INTRODUCTION

Even while the Indian family planning program has been effective in encouraging couples to use contraceptives once they have reached their intended family size, postpartum women have not received the same level of education regarding the use of contraceptives for birth spacing.¹ By avoiding undesired pregnancies and spacing out subsequent pregnancies, increased postpartum contraceptive use could significantly lower rates of mother and newborn mortality.²

After childbirth, contraceptive use may decline and then resume later on. The fact that only 17% of women utilize contraception within the first 6 months of giving birth and that number rises to about 33% between 6 and 12 months following giving birth raises perhaps the most urgent concerns.³ To alleviate this problem, efforts should be made to inform postpartum women about optimal pregnancy spacing and contraception. One such strategy is to counsel postpartum women and provide them with information on the numerous contraceptives that are available so they may make an educated choice about contraception. Some studies unequivocally demonstrate the advantages of counseling on postpartum women's acceptance of contraceptives.⁴⁻⁶ Because they don't return to the hospital after being discharged from the hospital following birth to get advice on contraception, many postpartum women miss out on the advantages of contraception. Only 6.8% of the postpartum

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women in our hospital setup were found to visit contraception clinics in a prior study.^{6,7} Therefore, it is necessary to investigate different intervention strategies that can boost visitors to contraceptive clinics.

As mobile phone ownership continues to increase rapidly in India, there is potential to utilize mobile telephony to improve

contraceptive uptake. It is an accepted fact that word of mouth is important in passing on health information; however mobile telephony may be pursued as a health communication tool since it shows a lot of potential to reach a large population.^{8,9} With this background, the present investigation has been designed using the SMS methodology to study its impact on the increase in family planning uptake and other tools held constant.

MATERIALS AND METHODS

Before starting the study, the Institutional Ethics Committee provided the necessary approval. (Application Number 2016/03/SC/33). The present study was a prospective, interventional, clinical study design.

Study Location

The location is MGM Medical College's Department of Obstetrics and Gynecology in Kalamboli, Navi Mumbai, and its Department of Pharmacology in Kamothe, Navi Mumbai.

Sample Size

The study included 200 postpartum women who gave birth in the obstetrics and gynecology department of a tertiary medical facility.

Women who are postpartum and less than 2 weeks postpartum and who meet the inclusion and exclusion criteria will be included in the study.

Inclusion Criteria

Postpartum women within 2 weeks of giving birth (before getting discharged) seeking contraceptive advice

- Women who agree to sign an informed consent form.

Exclusion Criteria

- Postpartum women more than 2 weeks post giving birth.
- Women opting for immediate postpartum intra-uterine device (IUD).
- Postpartum women opting for permanent method of sterilization.
- Women who do not agree to sign an informed consent form.

Sample Size

Postpartum women within 2 weeks of giving birth receive written appointment cards with or without intensive text-message reminders for attending the contraceptive clinic for counseling. The sample size with 80% power was calculated based on the assumption that the survey will detect at least 25% increase in the proportion of women attending a contraceptive clinic for counseling when receiving the written appointment cards along with intensive text-message reminders as compared to receiving only the written appointment cards. The type I error probability associated with this test of this null hypothesis is 0.05. The sample size per group was found to be 80. Considering a 20% dropout, loss to follow up the sample size was adjusted as 100 per group.

Study Groups

Postpartum women meeting the inclusion criteria were randomly allocated to the following groups using computer-generated random numbers.

Control Group: Hundred postpartum women receiving written appointment cards for attending the contraceptive clinic for counseling.

Intervention Group: Hundred postpartum women receiving written appointment cards along with intensive text-message reminders to attend contraceptive clinic for counseling.

Study Questionnaire

A questionnaire was created specifically for the study. A particular year's 2-month birth rate was recorded along with pertinent information, such as the day of delivery, whether the birth was natural or by cesarean section, etc. It was noted whether postpartum women had an IUD implanted right away after giving birth or had undergone permanent sterilization. They were left out of the investigation. The socioeconomic and demographic characteristics of postpartum women who return to the hospital for contraceptive counseling were identified. These characteristics included age, highest educational attainment, job status, and breastfeeding status.

A questionnaire recorded information on the number of these postpartum women in control (receiving the written appointment cards) or the intervention group (receiving the written appointment cards along with intensive text-message reminders) who came back to the hospital to attend the contraceptive clinic for contraceptive advice. Three appointment dates were provided to each postpartum woman for attending contraceptive clinics keeping their convenience in mind. The number of postpartum women accepting a contraceptive method was noted. The choices of contraceptive methods among postpartum women were recorded. The socio-economic, and demographical profile (age, highest educational level, employment status, and breastfeeding status) of postpartum women seeking contraceptive advice was also noted.

Study Procedure

The total number of births taking place was noted in the study questionnaire. During the discharge, the postpartum women were given a written appointment card with three appointment dates for contraceptive counseling. The information regarding those women who underwent permanent method of sterilization or IUD insertion immediately postpartum was recorded. Informed consent was taken from all postpartum women who agreed to be a part of the study. After enrollment, the women were randomly divided into two groups: the control or the intervention group. The attendance of both these groups of postpartum women in contraceptive clinics was noted and compared.

On the day of appointment for contraceptive counseling, the women were counseled regarding the various hormonal and nonhormonal contraceptive methods using standard counseling cards and samples. The participating women from both the groups (control and intervention) were asked to fill out a questionnaire regarding contraceptive usage and their choice of contraceptive method post contraceptive counseling. In the same questionnaire, participating women's socioeconomic and demographic profile was documented and recorded.

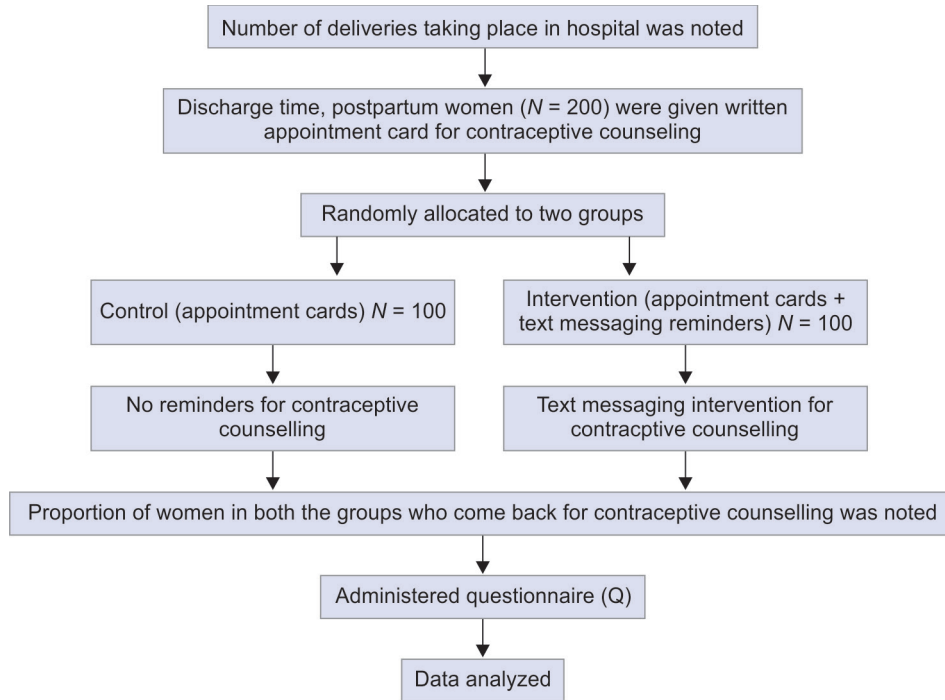


Fig. 1: Disposition summary of postpartum women

The effectiveness of the chosen method was categorized as

- Highly effective (10% of women encounter an unexpected pregnancy; includes sterilization, intrauterine device, injection, pill, patch, and ring).
- Moderately effective (10–15% failure rate; condoms included).
- Less effective (>15% failure rate; includes rhythm, sponge, cervical cap, and withdrawal).

Statistical Analysis

The proportion of postpartum women attending contraceptive clinics in the control and interventional group was presented as a shift table and was analyzed using Mc Nemar’s Chi-square test. The value of *p* less than 0.05 was considered as statistically significant.

RESULTS

Disposition Summary of Postpartum Women

Two hundred postpartum women who received routine written appointment cards for contraceptive counseling were randomly allocated to two groups: Control (not receiving any text messages) and interventional (appointment cards + text messaging reminders) group. These postpartum women were followed up to determine the proportion of postpartum women in the control and interventional group who attended the contraceptive clinics for contraceptive counseling (Fig. 1).

Demographical Profile and Proportion of Postpartum Women Attending Contraceptive Clinics

Maximum (54.5%) postpartum women who were followed up to determine the proportion of women attending contraceptive

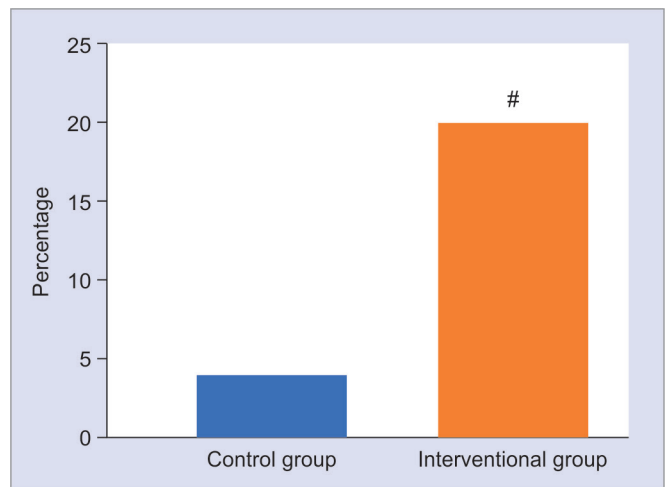


Fig 2: Proportion of postpartum women attending contraceptive clinic. *p* < 0.001 **Control** (postpartum women receiving only appointment cards) vs **Interventional** (postpartum women receiving appointment cards + text messaging reminders) group

clinics were of the age group 21–25. The mode of giving birth was normal for 68.0% of women and 32.0% had to undergo a cesarean section.

Out of 200 postpartum women who were followed up, only 4 (4%) in the control group compared to 20 (20%) in the interventional group attended the contraceptive clinic (Fig. 2). The majority of the postpartum women (96%) in the control group compared to (80%) in the interventional group did not attend contraceptive clinic (Fig. 2).

Characteristics of Postpartum Women Attending vs Not Attending Contraceptive Clinics

The characteristic of postpartum women attending ($n = 12$) contraceptive clinics and not attending ($n = 40$) contraceptive clinics is depicted in Table 1. 9.7% of the postpartum women not attending postpartum contraceptive clinics were uneducated,

Table 1: Characteristics of postpartum women attending vs not attending the contraceptive clinic

S.No	Characteristics	Attending contraceptive clinic (24)	Not attending contraceptive clinic (176)
1.	Age (years)		
	18–20	21.9%	25%
	21–25	39.02%	50%
	26–30	31.7%	16.6%
	31–35	7.3%	8.3%
2.	Mode of delivery		
	Normal delivery	92.6%	91.6%
	Cesarean section	7.4%	8.3%
3.	Education		
	Uneducated	0%	9.7%
	Less than 10th pass	41.6%	46.3%
	12th pass	33.3%	29.3%
	Graduate	25%	14.6%
4.	Employment status		
	Employed	14.6%	8.3%
	Unemployed	85.4%	91.6%
5.	Breastfeeding status		
	Breastfeeding	100%	100%
	Exclusive breastfeeding	83%	41.5%
	Awareness about lactational amenorrhea method	33.3%	17.1%

only 14% were graduates compared to NIL (0%) uneducated, and 25% graduates among those postpartum women attending the contraceptive clinics. The awareness regarding the lactational amenorrhea method (LAM) as a contraceptive method was superior among the postpartum women attending (33%) compared to those postpartum women not attending (17%) the contraceptive clinics. No significant difference between age distribution, mode of giving birth, and employment status was found between both groups.

A Comparison of the Effectiveness of the Contraceptive Method Chosen by the Two Groups

Figure 3 shows that 100% of postpartum women who attended a clinic for contraception chose a method, compared to just 44% of those who did not (postpartum women who did not attend a clinic for contraception). Only 29.2% of these new mothers chose highly effective techniques, as opposed to 83.3% of new mothers who visited contraceptive clinics (Fig. 4).

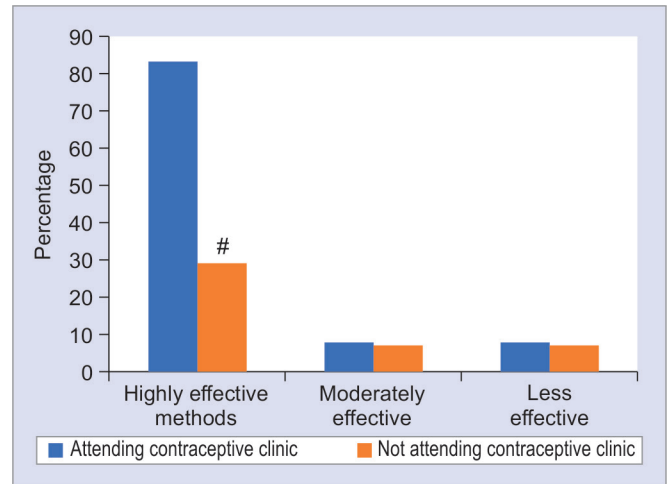


Fig 4: Comparative effectiveness of contraceptive method selected. $p < 0.05$ postpartum women attending vs not attending contraceptive clinics

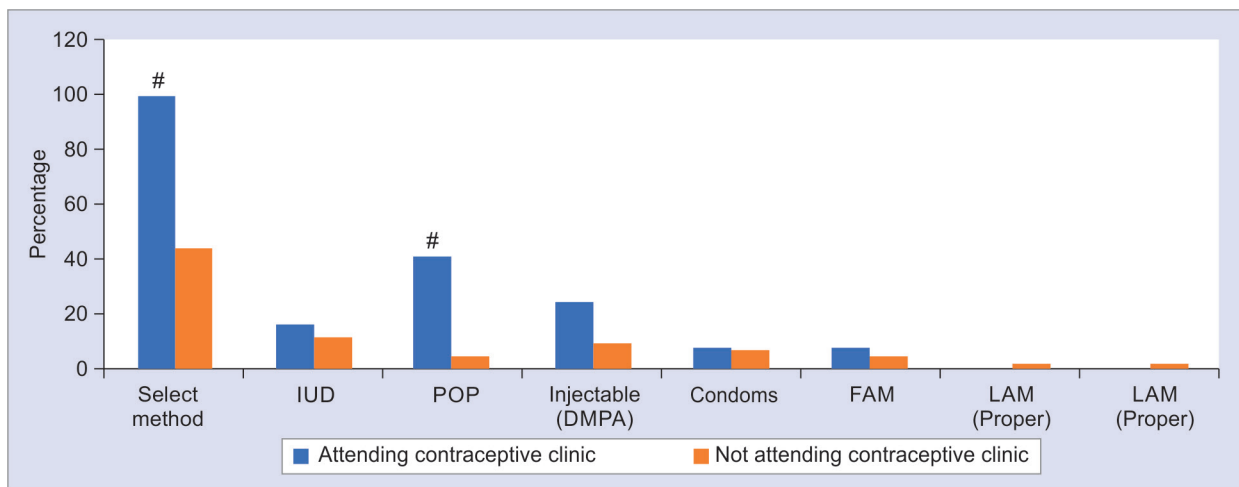


Fig 3: Contraceptive method selected among postpartum women. $p < 0.05$ postpartum women attending vs not attending contraceptive clinics FAM, fertility awareness method; IUD, intrauterine device; LAM, lactational amenorrhea method; POP, progesterone only pill

DISCUSSION

There is a sizable unmet need for contraception in India. A niche that can be effectively used to ensure contraceptive uptake and compliance is the postpartum period. An essential yet underused window of time to start using contraception is the postpartum period. Improperly spaced pregnancies significantly impact mother and child mortality. There is evidence to suggest that women and newborns face health concerns from closely spaced pregnancies. When compared to babies born 3 years later, newborns born fewer than 2 years after the next oldest sibling had a greater than twofold increased risk of dying in their first year of life, according to a study of data from the Demographic and Health Survey (DHS) for various years. Pre-eclampsia, proteinuria, hypertension, premature membrane rupture (although intervals of 6–14 months are significantly associated with a higher incidence), anemia, and edema were all found to be more prevalent in women with short inter-pregnancy intervals (6 months) compared to those with intervals of 27–50 months.^{1,10,11}

Even though many women (50%) want at least a 3-year interval between two births, national-level surveys reveal that the adoption of contraceptive techniques for spacing has remained low in India. According to NFHS-5 data (2019–21), 67% of women between the ages of 15 and 49 used some type of contraception to space out their pregnancies. Because short-interval pregnancies are a major contributor to infant morbidity and healthcare expenses,¹ postpartum contraception is essential. The unmet need for family planning (currently married women age 15–49 years) is 11.1%.

To avoid the harmful impacts of closely spaced births, medical guidelines advise implementing a family planning method 3 weeks after giving birth.¹² Among the contraceptive methods available to postpartum women are hormonal contraception [POP, Inj-DMPA [deoxy-progesterone acetate]], intrauterine devices, lactational amenorrhea, barrier contraception, natural family planning, and sterilization.⁹ Few studies have looked at how contraceptive counseling affects postpartum women's decisions regarding their contraceptive method. Women who received family planning counseling were more likely to take postpartum contraception than women who did not ($p = 0.001$), according to a 2010 study by Goel et al.¹³ Similar findings were found in studies conducted by Chhabra et al. Postpartum women are not taking full benefit of these sessions since they visit contraceptive clinics and use the counseling service in such low numbers.⁶ Kashyap et al.'s study discovered that, despite scheduled visits, only 6.8% of postpartum women actually went to contraception clinics.⁷ Rossier and Hellen gathered information from the five Sub-Saharan African centers. The attendance rates in the contraception clinics varied significantly between the different places, from 4 to 33%. The medical teams concurred that there was still a problem with low attendance at the 6-week checkups.^{14,15} If the initial family planning session is planned before the woman leaves the hospital after giving birth or if communication tactics are consistently employed to encourage postpartum women to use family planning services, reaching all women may be substantially easier.

Accordingly, the current study was created to investigate the effects of communication-balanced interventions employing appointment cards and mobile telephones on raising contraceptive acceptability among postpartum women. In order to boost the acceptance and usage of contraceptives, this study used a two-pronged strategy. Its primary goal was to use telephonic and message interventions to encourage postpartum women to visit

contraception clinics. The second goal was to analyze women's decisions and advise them about the various forms of contraception. It was noted how many postpartum women in the control group (who received written appointment cards) or the intervention group (who received written appointment cards as well as frequent text message reminders) returned to the hospital to attend the contraceptive clinic for contraceptive guidance. Each postpartum woman was given three appointment times to choose from so she could visit a clinic that offered contraception at a time that was convenient for her. It was noted how many postpartum women accepted a kind of contraception. The contraceptive methods that postpartum women chose were noted. The socioeconomic and demographic profile of postpartum women who sought vs did not seek guidance on contraception (age, highest educational level, employment position, and status of breastfeeding) was also observed.

Interpersonal communication has been drastically affected by the recent rapid growth in mobile phone use.¹⁶ Calls, texts, and smartphone applications provide additional channels of communication between service providers and clients in the health sector.¹⁷ This study focuses on mobile phone treatments that aim to increase the usage of contraception. Results demonstrated that out of the total postpartum women who were followed, only 4% in the control group compared to 20% in the interventional group (receiving reminder text messages) attended the contraceptive clinic. This study was unique in utilizing mobile telephony intervention to increase attendance at contraceptive clinics. The intervention increased the attendance of women from 4% to a staggering 20% which was statistically significant.

Overall, the POP, IUD, and Inj-DMPA injections were revealed to be postpartum women's top choices for contraception in the current study. This is consistent with the findings from the global survey on contraceptive use patterns^{2,12,16} in India. Interestingly, although all postpartum women practiced breastfeeding, only 17% of postpartum women who attended contraceptive clinics followed the guidelines for the LAM of contraception, compared to 58.5% of those who did not. Ironically, only 33.3% of postpartum women who attended compared to those who did not frequent contraceptive clinics knew that LAM was an effective means of contraception. Similar to the current findings, a study by Sheria et al. found that the majority of women appeared to be unaware that amenorrhea by itself would not prevent a woman from pregnancy. Because LAM was mainly unknown to the respondents, which appears to be the case in the current study as well, they appeared to underestimate the effectiveness of amenorrhea combined with exclusive breastfeeding for the first 6 months. For up to 6 months following childbirth, the LAM family planning method offers natural protection against pregnancy, giving women time to get ready to switch to another suitable, contemporary family planning method. Raising awareness of LAM and convincing women to either adhere to the LAM criteria are necessary.¹⁷

Only 29.2% of postpartum women who failed to return for contraceptive advice in the early postnatal period chose a highly effective form of contraception, compared to a high choice of highly effective contraceptive method (83%) among women who attended a contraceptive clinic. The urgent issue is still that the majority of postpartum women did not go to these clinics for contraception, potentially depriving them of the advantages of well-rounded contraceptive advice. The present study's findings regarding the inadequate uptake of family planning services may be related to the postpartum women's low educational status. Only 14% of

the postpartum women who didn't go to clinics for postpartum contraception had degrees. This may help to explain why these postpartum women have trouble accessing family planning services and are underinformed about the value of using contraceptives. The findings of the current study highlight the value of visiting clinics for contraceptive advice. Education of postpartum women and a decrease in the burden of unintended pregnancies, abortions, maternal and infant morbidity, and mortality are two benefits that could result from a communication intervention to promote family planning services.

In order to reduce the risk of unwanted pregnancy, this study emphasizes the need to use communication interventions to increase family planning services among postpartum women. Mobile phone interventions may be more advantageous than in-person interventions since they can be given whenever and wherever the patient needs them.^{9,19} Such treatments might be well-liked by young people who frequently use mobile phones. Additionally, these interventions may be able to reach communities in rural areas, where access to services may be limited by distance.²⁰

The use of evolving mobile phone technology to actively encourage women to utilize contraceptives is one of this study's key characteristics. It incorporates both hormonal and nonhormonal forms of contraception into the counseling process. The drawbacks include the limited sample size, the lack of follow-ups to assess compliance with the chosen form of contraception, and the exclusion of the spouse from the selection process.

CONCLUSION

It has been demonstrated that mobile phone-based interventions are more effective than standard appointment cards at persuading postpartum women to visit family planning clinics. The family planning program is meant to be available 6 weeks after giving birth, but very few individuals come up. Results revealed that just 4% of postpartum women followed in the control group went to the clinic for contraception, as opposed to 20% of those in the interventional group (who received text message reminders). IUDs, progesterone-only pill (POPs), and Inj-DMPA are the top contraceptive methods chosen by postpartum women. The acceptability of effective contraceptive methods increased significantly when postpartum women who attended contraceptive clinics were compared to those who did not.

Clinical Significance

The use of postpartum contraception may be affected by focusing education efforts on the importance of postpartum women visiting contraceptive clinics. Appointment cards and mobile phones were used in communication-balanced interventions that increased postpartum women's acceptance of contraception.

DECLARATION

Ethics Approval

Necessary Approval from IEC was obtained (Approval No: 2016/03/SC/33).

Authors Contribution

Anshruta Ramdeo: Conducted the study; Ipseeta Ray Mohanty: Conceptualized the study and wrote Manuscript; and Pramtima Thamke: Clinician who provided patients and provided clinical inputs during study.

REFERENCES

1. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS-5), 2019–21: India: Volume I. Mumbai: IIPS.
2. Hu D, Tang Y, Pei K. Strategies for improving postpartum contraception compared with routine maternal care: A systematic review and meta-analysis. *Int J Public Health* 2023;68:1605564. DOI: 10.3389/ijph.2023.1605564.
3. Sebastian MP, Khan ME, Kumari K, et al. Increasing postpartum contraception in rural India: Evaluation of a community-based behavior change communication intervention. *Int Perspect Sex Reprod Health* 2012;38(2):68–77. DOI: 10.1363/3806812.
4. Abdel-Tawab N, Loza S, Zaki A. Helping Egyptian women achieve optimal birth spacing intervals through fostering linkages between family planning and maternal/child health services. Washington, DC: Population Council; 2008 (9).
5. Lee JT, Tsai JL, Tsou TS, et al. Effectiveness of a theory-based postpartum sexual health education program on women's contraceptive use: A randomized controlled trial. *Contraception* 2011;84(1):48–56. DOI: 10.1016/j.contraception.2010.11.008.
6. Chhabra H, Mohanty IR, Deshmukh YA. Impact of structured counseling on choice of contraceptive method among post-partum women. *J Obstet Gynecol India* 2016;66(6):471–479. DOI: 10.1007/s13224-015-0721-x.
7. Kashyap C, Mohanty IR, Thamke P, et al. Acceptance of contraceptive methods among postpartum women in a tertiary care center. *J Obstet Gynecol India* 2017;67(2):91–97. DOI: 10.1007/s13224-016-0924-9.
8. Jadhav A, Weis J. Mobile phone ownership, text messages, and contraceptive use: Is there a digital revolution in family planning? *Contraception* 2020 Feb;101(2):97–105. DOI: 10.1016/j.contraception.2019.10.004.
9. Castaño PM, Bynum JY, Westhoff C. Effect of daily text messages on oral contraceptive continuation: A randomized controlled trial. *Obstet Gynecol* 2012;119:14–20. DOI: 10.1097/AOG.0b013e31823d4167.
10. Smith R, Ashford L, Gribble J, et al. Family planning saves lives. Washington, DC: Population Reference Bureau; 2009.
11. Chola L, McGee S, Tugendhaft A, et al. Scaling up family planning to reduce maternal and child mortality: The potential costs and benefits of modern contraceptive use in South Africa. *PLoS One* 2015;10(6):e0130077. DOI: 10.1371/journal.pone.0130077.
12. FSRH Clinical Guideline: Contraception After Pregnancy (January 2017, amended October 2020).
13. Goel S, Bhatnagar I, Khan ME, et al. Increasing postpartum contraception in rural Uttar Pradesh. *J Fam Welfare* 2010;56:57–64. DOI: 10.1080/00324720802022089.
14. Mruts KB, Tessemaac GA, Gebremedhinad AT, et al. The effect of family planning counselling on postpartum modern contraceptive uptake in sub-Saharan Africa: A systematic review. *Public Health*. 2022;206:46–56. DOI: 10.1016/j.puhe.2022.02.017.
15. Rossier C, Hellen J. Traditional birth spacing practices and uptake of family planning during the postpartum period in Ouaga dougou: Qualitative Results. *Int Perspect Sex Reproduct Health* 2014;40(2):87–94. DOI: 10.1363/4008714.
16. Bullen P. Operational challenges in the Cambodian mHealth revolution. *Journal of Mobile Technology in Medicine* 2013;2(2): 20–23. DOI: 10.7309/jmtm.2.2.5.
17. Sheriar N, Joshi R, Mukherjee B, et al. Impact of structured counseling on the selection of hormonal contraceptive methods: Results of a multi-centric, observational study in India. *J Obstet Gynecol India* 2014;64(4):241–250.
18. Lete I, Doval JL, Perez-Campos E, et al. Factors affecting women's selection of a combined hormonal contraceptive method: The TEAM-06 Spanish -sectional study. *Contraception* 2007;76:77–83. DOI: 10.1016/j.contraception.2007.04.014.

19. Harrington EK, Drake AL, Matemo D, et al. An mHealth sms intervention on postpartum contraceptive use among women and couples in Kenya: A randomized controlled trial. *Am J Public Health* 2019;109(6):934–941. DOI: 10.2105/AJPH.2019.305051.
20. Smith C, Gold J, Ngo TD, et al. Mobile phone-based interventions for improving contraception use. *Cochrane Database Syst Rev* 2015;(6):CD011159. DOI: 10.1002/14651858.CD011159.pub2.