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# Effect of Interventions in Improving Awareness, Knowledge and Practices of PPF among Women and Health-Care Providers in Bihar; a Pre- and Post-Intervention Study

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## ABSTRACT

**Background:** Post-partum family planning (PPFP) within first 12 months of childbirth is known to improve maternal and neonatal health outcomes. This study evaluates the effect a package of PPF interventions in improving level of awareness, knowledge and practices of post-partum women.

**Methods:** A before and after intervention cross sectional study was conducted in 18 public health facilities and their catchment areas across 5 districts of Bihar. Participants included randomly selected post-partum women and purposively selected health service providers. A standard questionnaire was used to assess the level of knowledge, awareness and practices related to post-partum family planning before and after the intervention.

**Results:** A total of 972 postpartum women, 27 doctors, 46 nurses, 89 Auxiliary Nurse Midwives (ANM) and 89 Accredited Social Health Activists (ASHA) as well as 981 postpartum women, 18 doctors, 53 nurses, 90 ANMs and 90 ASHAs were interviewed during baseline and end line respectively. This intervention package increased knowledge regarding postpartum return to fertility, modern FP methods and criteria of lactational amenorrhoea method. Also, the proportion of post-partum women who reported receiving FP counselling were increased.

**Conclusion:** The findings of this study demonstrate that effective implementation of a package of PPF interventions at a scale can lead to improvement in the knowledge and awareness levels of both health workers and post-partum women.

**Key words:** Post-Partum Family Planning, Health Worker, Knowledge, Awareness, Practices, Evaluation

## BACKGROUND

Post-partum family planning (PPFP), which is defined as use of family planning within the first 12 months of childbirth, can improve maternal and neonatal health outcomes by reducing 10% of child

deaths[1] and 32% of maternal deaths[2]. In India, like other low and middle income countries (LMIC) with similar context, more than 90% of women return to their sexual activity and 62% return to menses within twelve months after birth[3]. Only 26% of women use any method of contraception in their first

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year postpartum and 65% of them have an unmet need for family planning[3]. Return to sexual activity, return to ovulatory cycle and non-use of contraception within the first 12 months of childbirth lead to 61% of all births that occur before the recommended three years postpartum birth to birth interval[4]. Hence, improving awareness about healthy timing and spacing of pregnancy, return to fertility within the first few weeks after childbirth and improving access to contraception for women in their first year postpartum assumes significance from a policy and program perspective.

Studies have been undertaken to assess the effectiveness of single, stand-alone interventions on uptake of PPF services. A study that was conducted in Pakistan demonstrated that effective counseling on healthy timing and spacing of pregnancies, possibility of return to fertility as early as 4 weeks after childbirth and the benefits of family planning are major factors in influencing acceptance of postpartum contraception[5]. Similar evidence was generated in a healthy fertility study in Bangladesh, where community mobilization with use of field-tested messages on PPF led to improvement in use of contraceptives. Integration of PPF services within other service delivery platforms like HIV and immunization and innovative product delivery programs can increase knowledge and use of postpartum contraception[6]. However, most of these studies have been undertaken on a small scale in study and pilot settings and there is no study that evaluates the effect of a comprehensive PPF program, which includes a package of interventions, implemented at a reasonable scale in resource constrained health systems.

The objective of this study was to assess the baseline status, as well as to evaluate a package of PPF interventions on improving level of awareness, knowledge and practices of post-partum women and health care providers in Bihar. The learnings from this study can inform policy makers and program managers in India, and in similar such settings globally, on the design and planning for implementation of comprehensive programs for addressing the disproportionately large unmet need for family planning among women in their first year after childbirth.

## METHODS

A before and after intervention cross sectional study was done in the catchment areas of eighteen public health facilities of five districts of Bihar (Muzaffarpur, Saran, Madhubani, Gaya and Bhagalpur) in April-May 2012 (baseline) and March 2014 (end line). Post-partum women and health care providers were identified from the catchment areas and interviewed at each time point to determine the change in level of awareness, knowledge and practices related to post-partum family planning after implementation of the PPF package. Health care providers included doctors, nurses, auxiliary nurse midwives (ANMs)

and accredited social health activists (ASHAs) affiliated to the intervention facilities.

**Study setting:** Bihar has a population of 100 million, total fertility rate [TFR] of 3.4 and contraceptive prevalence rate (CPR) of 34.1%[7]. More than 90% of women in Bihar want to either delay or avoid future pregnancy within a year of their child birth but 75% of women do not use any method of contraception[8]. The government of Bihar has developed a strategy to focus on increasing access to contraception within the extended postpartum period (one year after child birth) in 2011[9]. The interventions were implemented in five districts of the state with a population of about 20 Million, reaching out to around 3.5 million eligible couples to generate evidence for further scale-up.

**Intervention:** The package of interventions included provision of quality counselling, integration of PPF services at maternal new born child health platforms and increasing awareness of and demand for PPF services[9]. Postpartum period was defined as the first year after the last child's birth[10]. Facility based health care providers at different levels were trained in a two day training session on counselling skills. These trainings included the technical content of counseling, the approaches of counseling and communication skills. The doctors and nurses based at facilities were trained in clinical contraceptive services through a 3 day training on PPIUCD services and a two day refresher training on contraceptive technology update. A short refresher training on postpartum sterilization was designed for orienting the existing female sterilization service providers on the clinical technique and program requirements for providing postpartum sterilization services. Master trainers who were trained in clinical and training competencies imparted these trainings. Field based health workers (ANMs and ASHAs) were trained on delivery of key family planning messages during provision of antenatal care, immunization sessions and postnatal home visits through one-day short orientation sessions. These workers were supported by developing an eco-system of enablers in form of service delivery tools, supervision systems and monitoring systems to increase awareness among the communities through integration of PPF messages in all the existing contacts of the women with the health system, from the antenatal period to the first year postpartum.

**Sample:** We included a sample of postpartum women residing in the catchment area of the 18 intervention facilities who delivered within the last nine months from the date of interview. To obtain this sample, we listed the villages in the catchment area of these facilities and randomly selected nine villages per facility using simple random sampling. The survey therefore involved 162 villages. On reaching the selected village, the investigators approached the ASHA and Anganwadi worker (community based nutritional worker) to collect the details of the postpartum women who had delivered in past nine months.

From the demographic and personal details in the registers, 9 women who delivered in institutions and 9 women who delivered at home were selected from each village using random sampling through pseudo random number generation in excel. The first three available and consenting postpartum women in each category were interviewed after obtaining oral consent; 972 and 981 postpartum women were interviewed in total before (during baseline) and after (end line) the intervention respectively. We did not do a prior sample size calculation although we ensured the representation of all villages belonging to the catchment areas of the eighteen intervention facilities in the sampling frame.

After the initial round of data collection and preliminary analysis after baseline, we found that some of the relevant information on unmet need for family planning, return to fertility, birth to birth interval and information on counseling was not captured with the original questionnaire (supplementary file number 4). Hence we added and modified the questions of the original questionnaire and administered this modified questionnaire (supplementary file number 5) to a smaller sample of 324 post-partum women who were randomly selected from the same catchment areas and communities using the same methodology. The modified questionnaire was administered during the end line survey to the entire sample of 981 postpartum women. To ensure that the 324 women who were administered the modified questionnaire were similar to the 971 originally interviewed women; we analyzed these samples for some relevant background characteristics and found them to be similar to each other. Additionally, there was non-response on some questions among these 324 women and the non-response rates ranged from 0 to 26%.

Doctors and nurses from the intervention facilities were selected by convenience sampling; those who were available in the facilities on the day of data collection and consented to participate were included. The ASHAs and ANMs linked to the 18 intervention facilities were randomly selected (by excel generated pseudo random numbers) from facility catchment areas. 5 ANMs & 5 ASHAs per facility were selected.

**Procedure and measures:** Once the selection was done, consenting post-partum women and health care providers were interviewed using standardized questionnaires (supplementary files 1-5) in the local language. The questionnaire consisted of questions on demographic and socio-economic profile (for post-partum women) as well as on knowledge, awareness and practices related to post-partum family planning.

The interviewers ensured confidentiality and privacy of participants during the interview. For ensuring data quality, all interviewers underwent a common 3 day training which included components of basics of post-partum family planning, discussion on questionnaires for women and providers and ethical

principles. Ten percent of the data was cross-verified by the data supervisors by back-checking with the respondents.

**Analysis:** Data was analyzed using SPSS version 22.0 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, version 22.0. Armonk, NY: IBM Corp.). We first described the background characteristics and knowledge and practices using proportions. Next, we assessed the effects of the package of PFP intervention on awareness, knowledge and practices of postpartum women and health care providers by comparing pre and post rates. We assessed the statistical significance of the differences by using chi square tests. A p value of less than 0.05 was considered statistically significant.

## RESULTS

**Background characteristics:** A total of 972 (at baseline) and 981 (at end line) women were included and interviewed. No statistically significant differences were found between the characteristics (age, education etc.) of the participants (Table 1).

A total of 27 doctors and 46 nurses were interviewed in the baseline and 18 doctors and 53 nurses during the end line. A total of 89 and 90 ANMs and 89 and 90 ASHAs, in baseline and end line respectively, were interviewed.

**Effects of the intervention on professionals and women:** Table 2 shows that generally there was an improvement in knowledge about return to fertility (among partially breastfeeding and fully breastfeeding women) and about the best time for counseling on postpartum family planning across all cadres of service providers. For knowledge on return to fertility among fully breast feeding women, maximum improvement was seen in doctors (48.1% vs 100% good) whereas for knowledge on return to fertility among partially breast feeding women, maximum improvement was seen in nurses (18.2% vs 90.6% good). For knowledge of best time to counsel on post-partum family planning, the maximum improvement was seen in ASHAs (3.4% vs 78.9%). Improvements in knowledge about these three aspects were statistically significant for all cadres.

Table 3 depicts that among post-partum women, there was an improvement in knowledge about return to fertility (both for fully and partially breast feeding women) as well as 3 criteria of lactational amenorrhoea (LAM) from baseline to end line. The proportion of women who knew about 3 or more modern family planning methods also increased significantly. There was no improvement in knowledge about birth to birth interval and no decline in unmet need for family planning.

Table 4 depicts that there was a statistically significant increase in the percentage of post-partum women receiving any contraceptive counseling as well as those who received all the important infor-

mation related to contraceptives like - available contraceptive choices, likely adverse events, return to fertility and healthy timing and spacing of pregnancies - from baseline to end line.

Proportion of post-partum women who were offered at least three modern contraceptive methods at health facilities also significantly increased.

## DISCUSSION

This study, which is the first of its kind to assess the effect of a comprehensive PPFPP strategy, demonstrates that a package of interventions for provision of quality counseling and contraceptive services, integration of PPFPP services with other health service delivery platforms and increasing awareness of and demand for PPFPP services in the communities, leads to an increase in the knowledge of service providers and women in their first year post-partum. Additionally, it also leads to improved service delivery at facility and community levels, which thereby results in increased awareness about PPFPP at the community level. The results from this study can inform the scale up of the PPFPP strategy in similar resource constrained settings in India and globally.

The awareness levels on key concepts of PPFPP like return to fertility among partially and exclusively breastfeeding women and on the three criteria of Lactational Amenorrhea method (LAM) was low across the cadre of health workers at baseline. This is perhaps due to the lack of regular technical updates on Family Planning for these public health providers. This lack of awareness about important concepts related to postpartum family planning among health care providers, including clinical providers like doctors and nurses, was a significant finding as the clinical providers are usually an important source of information about family planning for the community [26]. Lack of basic technical knowledge about contraceptive methods among health care providers has been observed in earlier studies as well. A study from Nigeria reported sub-optimal levels of basic knowledge about contraceptive methods among gynecologists who were supposed to deliver these services to clients[11]. This lack of awareness among health workers in the catchment areas of the study potentially contributed to the sub-optimal delivery of counseling and PPFPP services at the facilities, as was observed during the baseline. This finding is consistent with earlier studies which have identified lack of provider knowledge on contraceptive methods as an important barrier to delivery of quality services[12]. Lack of awareness about contraceptive methods among community based health workers, as observed during baseline in our study, has also been observed in India[13] and Cambodia[14]. This is probably due to the sub-optimal quality of pre-service training as well as non-inclusion of postpartum family planning related concepts in the curriculum of the trainings for the community based health workers. This is an important finding since a

lot of first time interaction of the health care staff with the women happens at the community level [25].

Recognizing this need for training for community based health workers like ANM and ASHAs, the PPFPP strategy included customized capacity building interventions for both facility and community based workers. For efficiency purposes as well as to maximize the reach of trainings, the strategy also used integration of PPFPP messages into other maternal and child health service delivery platforms like antenatal care services, immunization services and home-based newborn care by frontline health workers. This is in line with earlier studies which have reported the effectiveness of integration of family planning counseling and services in other health care services [20,23]. This update of the knowledge of the entire spectrum of healthcare providers was essential to bring about an improvement in the awareness levels and uptake of Family Planning services in the communities served by them. Earlier studies have also reported the importance of trainings of the health workers in increasing awareness about contraceptive services among communities[15,16]. The increased awareness among the facility based providers after the training interventions resulted in a significant improvement in the quality of counseling services offered at the facilities. This is in line with earlier studies that have reported that health workers with adequate knowledge about the relevant concepts of Family Planning can play an effective role in improvement of Family Planning services through effective interpersonal communication[17]. Studies have also suggested that training reduces the provider biases and hence increases the quality of services provided to clients[20]. The improvement in quality of counseling was also reflected in our study finding that the majority of women attending the targeted health facilities were counselled on the key concepts of return to fertility, need for spacing and adverse effects of FP methods, in addition to being offered at least three methods of contraception. In the context of concerns on quality of FP services in busy and resource constrained public health facilities, these findings have the potential to bring about a significant improvement in the dimensions of volunteerism and informed choice during delivery of FP services, through focused involvement of public health facility based health care providers.

Our study observed an improvement in the awareness of key concepts of the PPFPP among postpartum women in our catchment areas after the training interventions were delivered. This included increased awareness on return to fertility, three criteria of LAM and three methods of modern contraception. This is in line with existing studies, which have observed that training interventions for health care providers lead to an improvement in awareness of contraceptive services among communities [15, 16]. Improving provider awareness and competence has been proposed one of the core strategies for improving the

awareness and access to contraceptives for communities [27]. Given the extremely low levels of awareness among these women during baseline, the reasonably large scale at which this PPFp strategy was delivered and the focused nature of the interventions to increase this awareness through health care providers in absence of any concurrent mid or mass media behavior change campaigns, was an important finding for us. In light of the fact that mass media campaigns are resource intensive endeavors and that this strategy was delivered through a resource constrained health system, this finding has implications for design of future post-partum family planning programs, which are focused in nature, in similar settings in India and globally.

We believe that this increase in awareness of women about the key concepts of postpartum family planning as well as modern methods of contraception would translate to increased utilization of PPFp services, especially since we ensured service delivery of these services at the health facilities in our catchment areas as a part of PPFp strategy. This hypothesis was the basis for the design of the PPFp strategy for Bihar and was based on earlier studies that have also demonstrated the benefits of training interventions for the health care providers on access and utilization of FP service [18, 19, 21, 22].

Findings from our study indicate that a package of simple targeted capacity building initiatives for the health care providers along with creating an enabling environment for them for integrating and disseminating the PPFp messages in their regular engagements with clients can be effective in increasing the awareness about key concepts of PPFp among post-partum women and their communities. Effective capacity building of all cadres of workers involved in these services, effective integration of PPFp messages in the interactions of the health care providers with clients during antenatal, intra-partum and post-partum period as well as developing an ecosystem of enablers in the form of service delivery tools, structured supportive supervision mechanism, data collection systems and regular review mechanisms, are important for successful implementation of these interventions in a program mode, at scale.

A large number of maternal and neonatal deaths and complications can be averted by preventing unwanted pregnancies and by healthy spacing of pregnancies. We believe that the findings from our study will help the program managers and policy makers towards designing effective programs for increasing access to post-partum family planning services for women and their partners, thereby contributing to the achievement of the sustainable development goals.

### **STRENGTHS AND LIMITATIONS**

Though studies have been undertaken earlier to assess the effectiveness of isolated interventions on

PPFP services, this is the first study which evaluates the effects of a comprehensive PPFp program that includes a package of interventions implemented at a scale in a resource constrained setting in India. The study did not have a comparison arm and therefore the fact that other factors or secular trends may have played a role in bringing about the observed changes cannot be ruled out. The respondents during baseline and end line data collection – for both groups of study participants- were different. However, we found no significant difference between the background characteristics of post-partum women interviewed at baseline and end line. Facility based health service providers (doctors/staff nurses) were selected by convenience sampling and therefore the sample included may not be representative of the population. Information on knowledge about unmet need of family planning, return to fertility and ideal birth intervals was obtained from lesser number of post-partum women during the base line and hence the comparisons (baseline-end line) for these parameters were performed at a lesser power than for the remaining parameters.

### **CONCLUSION**

The findings of this study demonstrate that effective implementation of a package of interventions at a scale can lead to improvement in the knowledge and awareness levels of health workers and post-partum women. These findings are useful for planning and implementing interventions at a scale to increase access to contraception for post-partum women in similar resource constrained settings, globally.

### **ABBREVIATIONS**

PPFP: Post-partum family planning; ANM: Auxiliary Nurse Midwives; ASHA: Accredited Social Health Activists; LMIC: Low and Middle Income Countries; TFR: Total fertility rate; CPR: Contraceptive Prevalence rate; SPSS: Statistical Package for Social Sciences; LAM: Lactational Amenorrhea.

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role in the study design, data collection, analysis, decision to publish or in preparation of the manuscript.

#### AVAILABILITY OF DATA AND MATERIAL

Data are available from Jhpiego's internal institutional data access committee for researchers who meet the criteria for access to confidential data. Corresponding author can be contacted for further communication.

#### AUTHORS' CONTRIBUTIONS

SK, VS and AB developed the concept and designed the research. AB and VS were involved in data collection. AS, AB and SK did data cleaning and analysis. ST conducted literature review for supporting drafting of the manuscript. SK, VS, AB, AS and ST drafted the manuscript. JS critically reviewed the manuscript. All authors read and approved the final manuscript.

#### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was carried out with the permission from Government of Bihar. The institutional review board of Johns Hopkins Bloomberg School of public health (JHIRB No. - IRB00004138) approved the study, including a waiver of written consent. Oral informed consent was obtained from the study participants.

#### SUPPLEMENTARY FILES

Following files were available with corresponding author on request.

1. Interview schedule for ANMs – Bilingual (Hindi and English) study questionnaire used for interviewing ANMs.
2. Interview schedule for ASHAs – Bilingual (Hindi and English) study questionnaire used for interviewing ASHAs.
3. Interview schedule for Doctors-Nurses – Bilingual (Hindi and English) study questionnaire used for interviewing doctors and nurses.
4. Interview schedule for postpartum women – Bilingual (Hindi and English) study questionnaire used for interviewing post-partum women.
5. Supplementary\_Survey\_Tool – Bilingual (Hindi and English) study questionnaire with additional questions for post-partum women.

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