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## Reaching the unreached through community mobilization in an innovative and sustainable way

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# Reaching the Unreached through Community Mobilization in an Innovative and Sustainable Way



2014

ARUPENDRA MOZUMDAR • ME KHAN • SUBRATO K MONDAL



# OPERATIONS RESEARCH

REACHING THE UNREACHED THROUGH  
COMMUNITY MOBILIZATION IN AN  
INNOVATIVE AND SUSTAINABLE WAY

Arupendra Mozumdar  
ME Khan  
Subrato K Mondal

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# TABLE OF CONTENTS

Table of Contents	iii
Acknowledgments	v
List of Abbreviations	vi
Executive Summary	vii
Introduction	1
Methods	5
Results	14
Discussion	25
References	27



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# LIST OF ABBREVIATIONS

ANC	Antenatal Care
ASHA	Accredited Social Health Activist
AWW	Anganwadi Workers
BO	Block Organization
CAPI	Computer Assisted Personal Interviewing
CHTs	Community Health Trainers
DID	Difference-in-Difference
FP	Family Planning
GEE	Generalized Estimation Equation
GP	Gram Panchayat
IFA	Iron and Folic Acid
IHBP	Improving Healthy Behaviors Program
KMC	Kangaroo Mother Care
MCH	Maternal and Child Health
MNH	Maternal and Newborn Health
MoRD	Ministry of Rural Development
OBC	Other Backward Class
OR	Operations Research
PC	Population Council
PNC	Post Natal Care
RGMVP	Rajiv Gandhi Mahila Vikas Pariyojana
SC	Scheduled Caste
SHG	Self Help Group
SRS	Sample Registration System
ST	Scheduled Tribe
TT	Tetanus Toxoid
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UP	Uttar Pradesh
USAID	United States Agency for International Development
VHSND	Village Health Sanitation and Nutrition Day
VO	Village Organization

# EXECUTIVE SUMMARY

One of the major components of IHBP is testing innovative ways to reach the unreached with family health messages and evaluate their outcomes for strategic communication programs focusing on behavior change. Community health workers like Accredited Social Health Activists (ASHAs) reach only 40 to 50 percent of women of their catchment area in states such as Uttar Pradesh (UP) and Bihar (Khan et al. 2012a, 2012b). Largely, marginalized populations are excluded from such program benefits. Excluded and marginalized populations include those in remote hamlets, scheduled castes, scheduled tribes, or other disadvantaged groups such as minorities and the economically poor.

It is essential to involve other platforms such as Self Help Groups (SHGs) to reach currently unreached sections of the community. It is hypothesized that the group setting of SHGs will provide the opportunity for discussing health issues, help assimilate information received within the group, and prevent harmful practices related to maternal and child health (MCH). It is also assumed that in the long term such social designs will lead to sustainable behavioral change by facilitating healthy behaviors as a community norm. This study aimed to increase appropriate knowledge in communities using community platforms for improving healthy behaviors and reaching vulnerable communities, thus contributing to three of four intermediate results of USAID-India's original objectives under IHBP: to increase appropriate knowledge in communities, using community platforms of women for improving healthy behaviors, and reaching vulnerable communities.

The key objectives of the study were:

- to assess if SHGs are an effective forum to disseminate knowledge, positive attitudes, and supportive subjective norms, and in the long term the practice of, safe family health behaviors that have a direct bearing on improving maternal and child mortality/morbidity indicators, and
- to identify the factors that facilitate or hinder sustainability and scalability of the interventions (using SHG forum to provide health messages and using a peer educator from the group as *Swasth Sakhi*).

The study was conducted in collaboration with RGMVP, a rights-based organization in the Jhansi district of Uttar Pradesh. RGMVP works in 52 districts and has established nearly 106,000 SHGs. The intervention included providing information on health practices and engaging SHG members in discussion and participatory counseling by a peer educator belonging to the same SHG identified and trained as a *Swasth Sakhi*. The existing supervisory mechanism of SHGs provides supportive supervision to *Swasth Sakhis*. Members of Village Organizations (VOs), the supervisory cadre for SHG activities and micro-financing work, also provide supportive supervision for this activity.

The intervention for this operations research (OR) study included a day-long training for *Swasth Sakhis* in the experimental area using a small flip book/counseling aid developed by the Population Council. A total of 11 trainings were organized, and 275 *Swasth Sakhis* and VO members of 109 SHGs attended. The same staff from the Population Council provided all trainings.

A panel study with experimental-control pre-post intervention design was used for the evaluation. Inclusion criteria for eligible households were the presence of: a) at least one family member as a SHG member, and b) availability of at least one married woman between 18 and 49 years old in the household. SHG records of RGMVP were used to identify SHG households. All SHG households from the selected Gram Panchayats (GPs) were listed, and the eligible households were identified during house listing.

The selection of the experimental and control areas were purposive; no randomization to the intervention was done. Before the intervention, at baseline, 803 women, who volunteered for participation, from eligible households were interviewed for the quantitative assessment. Out of that, 446 women were in the experimental area and 357 women from the control. At endline a total number of 470 women of the original 803 women were followed up; of these 233 women from the experimental area and 237 women were from the control area. The major reasons for non-participation were unavailability of the participants at home during the harvesting time, and engagement with family and social events related to the yearly autumn festival.

Additionally, 16 in-depth interviews (IDIs) with women, *Swasth Sakhis*, and RGMVP staff were conducted in the experimental area to understand how the intervention was working and identify the facilitating factors and barriers for the intervention's success. *Swasth Sakhi* knowledge of the topics covered in the intervention was assessed before and after the training. The district coordinator conducted structured observations of the quality of health discussions led by *Swasth Sakhis*. A total of 30 SHG meetings were observed, and the process was documented with an observation checklist.

Initial analysis of the characteristics of drop out cases of women interviewed at baseline and those successfully followed up showed no difference. Analysis of the collected data showed that nearly half of SHG members did not attend SHG meetings regularly. Still, findings indicate the SHG platform's usefulness for delivering health messages, as net changes in women's knowledge are significant for most health messages. For most maternal and newborn health topics, the net change knowledge from baseline to endline was statistically higher in the experimental area than in the control, confirming the intervention's effectiveness. The other key determinant found to be significant is women's education status. In a small sample of study participants who had delivered a child within two months prior to the endline, a higher percentage of women of the experimental area did correct practice of maternal and newborn health behaviors compared to their counterparts in the control area. Although the difference was not statistically significant, the small sample size provided little power to obtain a significant result.

Using RGMVP SHGs to disseminate health messages to the poor and unreached sections of society was an innovative strategy. The study shows the potential of the SHG platform to deliver health messages to increase women's knowledge. The intervention could be more effective, however, if SHG platforms are well established and functioning regularly for more than a year. Education helps increase women's knowledge levels. Given the present scale at which RGMVP is functioning and how it is expanding in UP, SHGs provide an important platform for scaling up.

# INTRODUCTION

One of the major components of IHBP was to test innovative ways to reach the unreached with family health messages and evaluate its outcome for strategic communication programs focusing on behavior change. Moreover, USAID-India, the funding organization for IHBP, has several objectives for intermediate results (IR) in India. Of the IRs related to IHBP this study was conducted addressing three of four IRs of USAID-India original objectives under IHBP; they were: to increase appropriate knowledge in communities, using community platforms for improving healthy behaviors, and reaching vulnerable communities.

The most populous state UP has 28 percent of neonatal deaths and 35 percent of maternal deaths in India. UP alone contributes to almost 10 percent of global maternal and neonatal deaths (SRS 2011). Reducing maternal and neonatal mortality in UP can contribute significantly for India to meet its Millennium Development Goals 4 and 5 i.e. reduce child mortality and improve maternal health. Despite proven family health interventions for reducing neonatal mortality and improving MCH, there is a dearth of evidence and documentation on scaling up successful and cost effective community-based interventions for rapid and sustainable impact on family health outcomes. A recent study by Population Council (PC) showed that even after five to six years of the introduction of *Janani Suraksha Yojana*, community health workers like ASHAs are covering only 40 to 50 percent of women in their catchment areas in states such as UP and Bihar (Khan et al. 2012a, 2012b). Those left behind are mostly women from marginalized families, those who live in remote hamlets, belonging to scheduled castes (SCs), scheduled tribes (STs), or other disadvantaged groups such as minorities and poor families. Media such as newspapers, television, and radio do not reach about 65 to 75 percent of this population.

Given that neither ASHAs nor mass media, reach a significant proportion of the population, and that the most disadvantaged population remains left behind, it is essential to involve other departments and platforms to complement the effort to include the currently unreached sections of society. Prior to the selection of any such department or platform, it is critical to assess whether they share similar commitments to family health intended by the initial program. Such departments and platforms include:

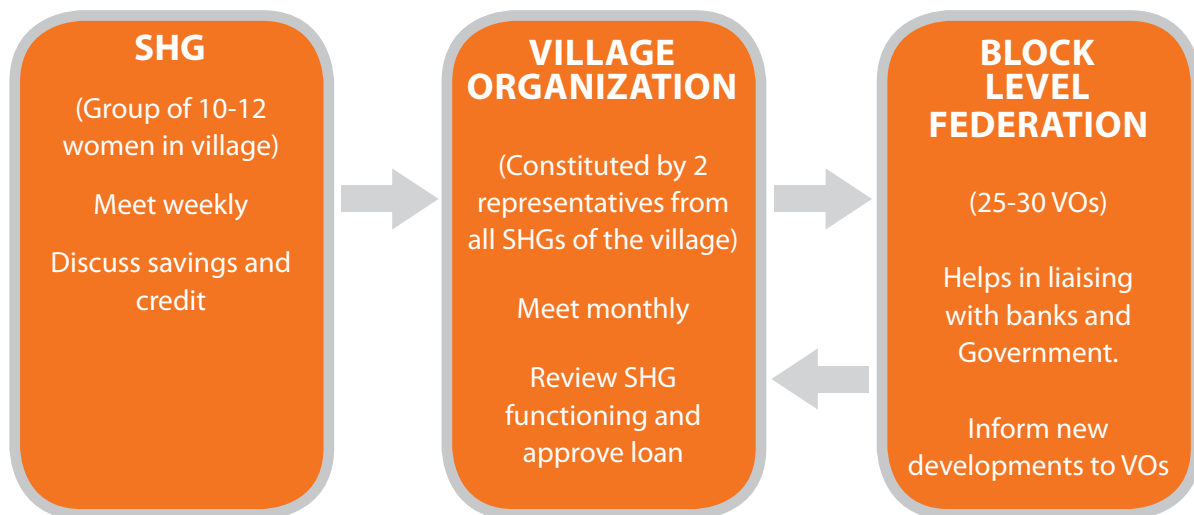
- the Integrated Child Development Services under the Ministry of Women and Child Development,
- the Public Health Engineering Department,
- the Ministry of Panchayati Raj, and
- SHGs developed and promoted by various departments like the Ministry of Women and Child Development, Government of India and the Ministry of Rural Development (MoRD) (Khan et al. 2012c).

Among these four platforms, the first three are more focused on the socio-political and economic development of the general rural population, and their target groups are not specifically marginalized. The MoRD launched the *Aajeevika* National Rural Livelihoods Mission in 2011 to create institutional platforms for the rural poor (SHGs and federations of SHGs) enabling sustainable livelihoods and financial inclusion. The Mission aims to cover 70 million below poverty line households across 600 districts in the country for a period of 10 years (*Aajeevika* n.d.). The Mission has been conceived as the cornerstone of the national poverty reduction strategy (GoI 2012).

SHGs are generally a voluntary group of 10 to 12 women in villages meeting regularly (2 to 4 times a month), usually for microfinance activities and discussing and resolving issues of concern to them and their community. In certain programs, SHG activities such as record keeping are facilitated by trained staff, including Community Mobilizers or Coordinators. In general, a group of 10 to 15 SHGs form a village organization (VO), and around 25 to 30 VOs are federated at the block level (Figure 1).

SHGs convene groups of unrelated women, by allowing them to expand their social networks outside the family, expand their social capital, foster solidarity and learning from each other, and create wider opportunities for raising their voices and demands (Mohindra 2003). Moreover, they play an active role in community mobilization, i.e. encourage participation and action by the community to make use of its resources in the best way for development of the community (Storey 2011, UNESCO n.d.). Community mobilization strengthens community participation for sustainability and self-reliance (WHO 2006). Literature shows that SHGs play a key role in empowering disadvantaged groups and uniting members of a group to demand their rights to services (Raju and Nikhilesh 2010, Reddy and Manak 2005, Sundram 2001). SHGs have the potential for social mobilization, to engage and motivate a wide range of partners and allies at national and local levels to raise awareness of and demand for healthcare services (UNICEF n.d.).

Figure 1: The linkage between SHGs, Village Organizations and Block Level Federations



Source: Adapted from Khan et al. 2012c

In recent years, the SHG model has emerged as a promising institutionalized and scalable demand-side social platform for scaling up family health interventions. Most SHGs rest on the principle of economic empowerment through microfinance activities, and a few specifically focus on women’s issues. A few organizations also promote health through SHGs. Some organizations like Project Concern International created new SHGs keeping health as the prime agenda, without microfinance, and the driving force to build the social platform.

Others such as JEEViKA in Bihar, piloted women outreach workers or JEEViKA *Sahelis* in three districts with 40 VOs. JEEViKA *Sahelis*, selected by VOs were trained and are supposed to make SHG members aware of public health services entitled to them, motivate them to utilize these services and deliver basic health services such as testing for pregnancy and blood pressure, among others (Khan et al. 2012c).

The extent to which health issues alone can be attractive enough to bring women and their families together as a platform for change is questionable. Interviews and discussions with Chiefs of Party of development organizations and programs that nurture SHGs revealed that, until now, no systematic evaluation has assessed whether SHG forums could be used to provide health messages and engage in related dialog and, to what extent, could help increase knowledge, change intention to adopt and finally adopt healthy practices. Kincaid (2000) demonstrated an effective use of the social network approach to sustainably change contraceptive behavior in Bangladesh. Other studies in the literature also show that community mobilization and networking of civil society organizations like SHGs can play a key role in empowering marginalized and disadvantaged groups and unite members of a group to demand their rights to services (Sundram 2001, Reddy and Manak 2005, Raju and Nikhilesh 2010).

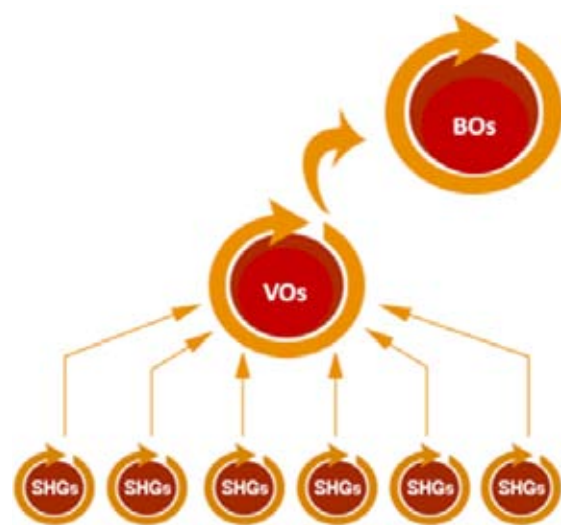
Self Help Groups of RGMVP mainly work to improve social and economic conditions of a community's most disadvantaged groups, especially women's empowerment. RGMVP is a rights-based organization in UP, India. Currently RGMVP works in 52 districts of UP and has constituted nearly 106,000 SHGs (RGMVP 2014).

Each SHG of RGMVP consists of 10 to 12 families and from each family one member becomes the member of the SHG. In each GP approximately eight to 10 SHGs are constituted. In larger GPs the number could go up to 15 to 25 SHGs. The SHG members make regular savings over a few months until there is enough capital in the group to begin internal lending. Funds are then lent to members in times of need or to start livelihood initiatives. After sufficient savings, SHGs are linked to banks by opening a SHG account and subsequently when the bank is satisfied with the regularity and functioning of the SHG, they are given a cash credit limit to access micro-credit and take loans.

All the SHGs mobilized at the village level are federated into Village Organizations (VOs). Two women from each SHG are nominated by the SHG members to represent the SHG in VOs. Thus depending on the number of SHGs in the GP, each VO consists of 20-35 SHG women. These VOs in turn are federated into Block Organizations (BOs), representing 5,000 to 7,000 women (Figure 2). Thus, the SHG model of RGMVP is organized in a three tier system of SHGs, VOs and BOs.

With this backdrop, OR was conducted through community mobilization in an innovative and sustainable way by using SHGs as the platform to provide information of healthy practices that could influence health of women and newborns. The aim of the OR was to assess the feasibility of having SHGs become an effective channel for imparting information and engaging in dialog on healthy practices to improve women's knowledge and intention to adopt those practices. The study also explored the feasibility of using a member of the same SHG as a peer educator to provide information on healthy practices and the quality of counseling she could give to other women of the SHG. These women were called *Swasth Sakhis*. The existing supervisory cadres of

Figure 2: Federal Structure of SHG Organizations of RGMVP



Source: RGMVP website. Retrieved from <http://www.rgmvp.org/about-model.asp?lk=ab3/>

SHGs, known as VO members, were supposed to provide supportive supervision to the activities of the *Swasth Sakhis*.

The project envisaged that the intervention would not only help in generating demand but in the long run will also create pressure on service providers and the health system to take note of the increasing demand for services and provide the required services. However, in the short run we did not expect any significant increase in supply or change in the health system nor was it required to achieve the objective of the present exercise. It is important to mention that the immediate outcome variables (knowledge gain and increased intention to adopt healthy practices) of the project are not dependent on the supply of services. Many of the interventions were part of the family health behaviors such as breastfeeding, delayed bathing of the baby, clean cord care, among others.

## OBJECTIVES

The objective of the study was to demonstrate and document the feasibility of using SHGs as a forum for promoting healthy behaviors related to maternal and newborn health and family planning, while using one of the women of the SHG as a peer educator in this effort.

The specific objectives were:

- to assess if SHGs are an effective forum to disseminate knowledge, positive attitudes, and supportive subjective norms, and in the long term the practice of, safe family health behaviors that have a direct bearing on improving maternal and child mortality/morbidity indicators, and
- to identify the factors that facilitate or hinder sustainability and scalability of the interventions (using SHG forum to provide health messages and using a peer educator from the group as *Swasth Sakhi*).

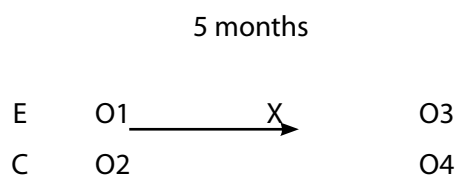
It was hypothesized that the group setting of an SHG forum will provide the opportunity to discuss and debate on the information provided by the peer educators or *Swasth Sakhi* who also belong to the community, share the same values, language and cultural background. Such group discussions could help in increasing their knowledge and in adopting healthy behavior related to maternal and child health behaviors.

In this section, a detailed account has been provided on the study design, study area and population, intervention plan, input and output indicators, and analysis plan to evaluate the study.

# METHODS

## STUDY DESIGN

An experimental control and pre - post design was used in this study to test the hypotheses mentioned at the end of the last chapter. The design of the study is presented in a diagram as shown below.



Where:

E represents the experimental group

C represents the control group

X represents the intervention

O1 represents pre intervention observations of the experimental group

O2 represents pre intervention observations of the control group

O3 represents post intervention observations of the experimental group

O4 represents post intervention observations of the control group

## STUDY LOCATION

The study was conducted in Jhansi district in Uttar Pradesh. The reasons behind selecting Jhansi were twofold. First, USAID India while reviewing the concept note also agreed on working in Jhansi. Second, both the IHBP OR studies were carried out in the same district but different blocks, therefore, the logistics and support staff of the project were utilized more effectively.

Bangra and Baragaon administrative blocks of Jhansi district were selected as the study sites. These two blocks were selected because of the presence of enough number of RGMVP SHGs in the area to cover the sample requirement. In fact the number of RGMVP SHGs was the maximum in Babina block. However, that block was not considered because of presence of a prior intervention by UNICEF on a similar topic. Initially it was planned to randomize the GPs of these two blocks either into experimental and control area. However, just



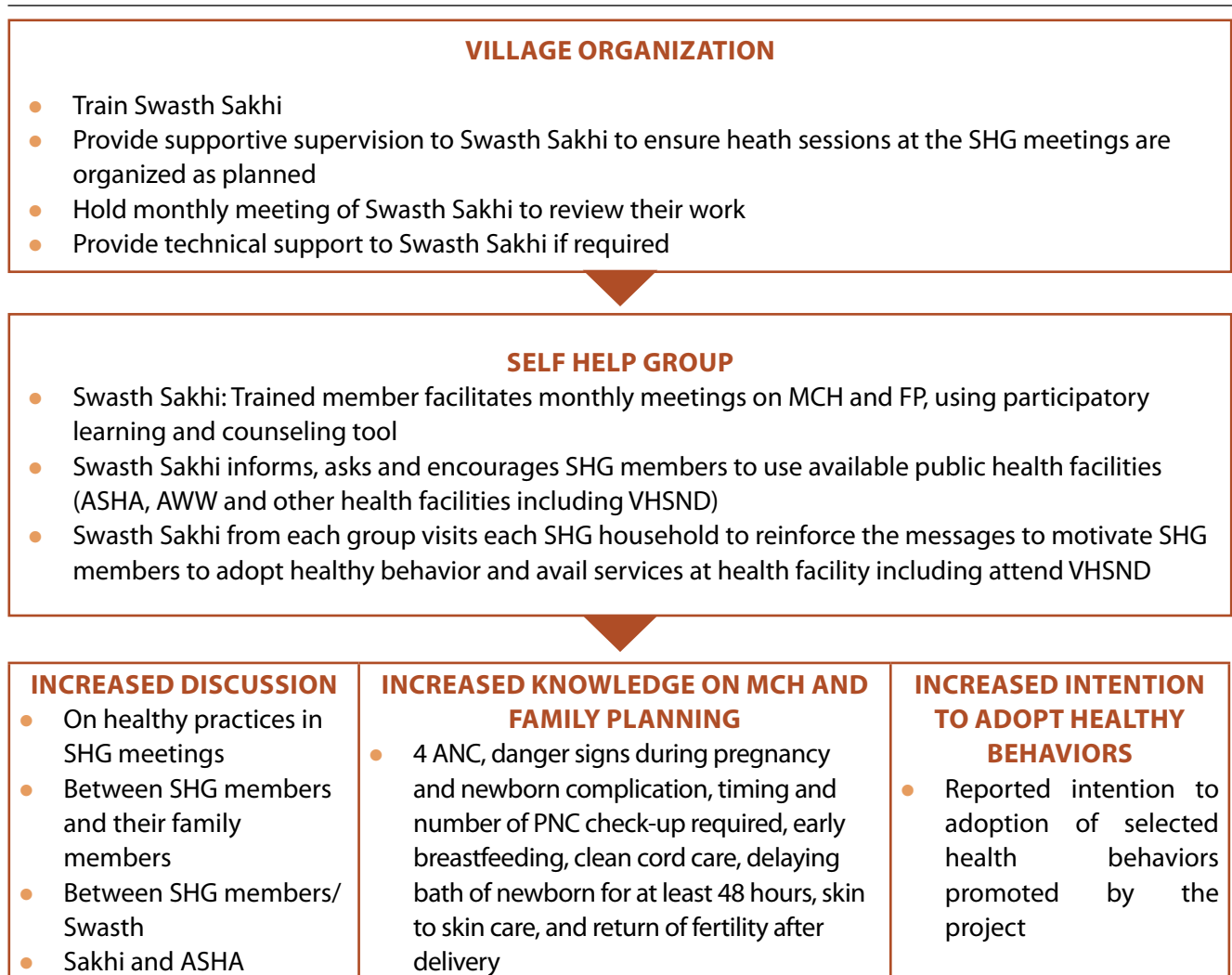
before the start of the intervention, RGMVP decided to start a similar intervention program in all the GPs with SHG of Bangra but not in Baragaon. GPs of these two blocks, where RGMVP SHGs were present, were selected. Therefore, in Bangra, 25 GPs were selected as the experimental area. While 23 GPs in Baragaon were selected as the control area.

## INTERVENTION

In the present study, the intervention had three components:

- use of the SHG platforms to provide information on healthy maternal and newborn practices and engage the SHG members in participatory discussion and counseling.
- use of one of the women from the same SHG as a peer educator. Before working as a peer educator, the selected woman was given training and provided with counseling aids. She was designated as *Swasth Sakhi*. For each SHG, at least one *Swasth Sakhi* was trained.
- use of selected VO members, who had the supervisory role of SHG activities related with micro-financing, were also trained with *Swasth Sakhi* and to provide supportive supervision to the *Swasth Sakhi* to conduct health session in the weekly SHG meetings (Figure 3).

FIGURE 3: CONCEPTUAL MODEL OF THE INTERVENTION IN THE STUDY



The first component provided a forum where group discussion on health issues could regularly take place. Women of the SHG get opportunities to question and clarify their doubts or myths related to the health issues. Such group dynamics helped to assimilate new learning, change intention to adopt and in the long run in adopting the healthy practices.

The second component intended to create a change agent within each SHG in the form of a *Swasth Sakhi* to act as a peer educator. At least one *Swasth Sakhi* from each SHG was selected by the SHG members themselves, based on her interest in promoting health and preferably a minimum educational qualification of 5<sup>th</sup> standard. *Swasth Sakhis* were trained by the Council staff in: a) topics related to maternal and newborn health and postpartum family planning, b) communication and counseling and c) what different public health services are available which could be availed for receiving services. From each VO, at least one VO member was also trained by the Council staff along with *Swasth Sakhis*.

The third component of the intervention was supportive supervision by the members of VO. Each GP has one VO and it is constituted by taking two senior and active members from each of the SHGs of that GP. The VO members, who had greater interest in promoting health for community welfare, were volunteered for supportive supervision.

To provide a counseling aid to each *Swasth Sakhi*, the Council developed a booklet that provided a quick pictorial reference for mother and newborn health (Figure 4). The sketches and messages had been adopted from a training module for community health trainers (CHT) of RGMVP, originally developed jointly by the PHFI and RGMVP for a different project. The key messages are on the healthy behaviors related to MCH having direct bearing on maternal and newborn care including post-partum contraception. The messages included: 1) four antenatal care (ANC) check-ups during pregnancy, 2) danger signs during pregnancy, 3) newborn complications, 4) timing and number of postnatal care (PNC) check-ups required, 5) early breastfeeding, 6) clean cord care, 7) delaying bath of newborn for at least 48 hours, 9) skin to skin care, and 10) return of fertility after delivery.

Figure 4: Counseling aid for *Swasth Sakhi*



## Implementation of the intervention and monitoring

Training of the *Swasth Sakhis* and VO members of SHGs was conducted in Bangra block. Three trainings batches were conducted in RGMVP office of Bangra. Four trainings were conducted in different GPs of Bangra for the convenience of the attendees from remote areas. A total of 280 counselling aids were distributed among the attendees of the training. A second round of trainings was conducted in June 2014 among those *Swasth Sakhis* and VO members who could not attend in the first round of trainings. A total of 11 trainings were organized throughout Bangra. The Council staff along with the district coordinator gave all the trainings. The CHTs of RGMVP were also present in the trainings and reinforced the messages in local dialects. In total 109 *Swasth Sakhis* and 166 VO members attended the

Figure 5: Training of *Swasth Sakhi* and Village Organization Members



Photo credit: Balbeer Singh Kandari, Population Council

training. Some of the SHG members could not be trained because either they were non-functional at the time of the study or were in nascent stage and hence could not become part of any new activity.

SHGs usually meet four times in a month each time for about an hour. In one or two such sessions, a half an hour was fixed to discuss health issues and behavioral change required to make the family healthy. However, the allocation of time was self-selected by the group and the discussion time on health sometimes extended beyond half an hour. In one session one to two topics were discussed such as ANC check-ups and the danger signs in the newborn. Initially in most of the meetings the CHT of the RGMVP responsible for a particular GP/zone was also present. Sometimes CHT of RGMVP used their big flipcharts and props to reinforce the messages given by *Swasth Sakhi*.

SHG members were encouraged to share the information on maternal and newborn health given in the SHG meeting with women of their household, as well as friends and neighbors who are not member of the SHGs, and also with other members of the households such as husbands, mothers-in-law, daughters-in-law, among others. Sometimes such women were also invited to join in the SHG meeting. *Swasth Sakhis* were also advised to inform the SHG members about different sources of health care services such as ASHA, Anganwadi Worker (AWW) and public health facilities and village health sanitation and nutrition day (VHSND).

The district coordinator hired under the project regularly attended the SHG meetings where the maternal and newborn health topics were being discussed. The district coordinator also attended the meetings of VO and BO; and reinforced the trainings and counseling strategies to the VO members and BO members. In total the coordinator attended 49 such meetings. Of these 37 meetings were with SHGs, four with VOs, eight with BOs and one with district staff of the RGMVP. Observation reports of all the meetings were prepared and qualitative descriptions of the meetings were written in Hindi. The counseling abilities of the *Swasth Sakhis* were monitored using a structured observation checklist. Structured observation of 30 discussion sessions of SHG were done, where *Swasth Sakhi* discussed health topics. Apart from these the Council staff also visited and participated in the discussions in SHG to give feedbacks and encouraged to organize regular meeting on health topics.

## EVALUATION

The process and impact of the intervention were evaluated by conducting both quantitative and qualitative assessments. The quantitative assessment included monitoring of the intervention and a panel study of the knowledge and intention of behavior of eligible women conducted both at baseline and endline. In the qualitative assessment, IDIs of key informants were conducted. The key informants included selected women, *Swasth Sakhis* and VO members. The details of both quantitative and qualitative assessments are given below.

### Quantitative assessment

The quantitative assessment of the intervention was done by monitoring of the intervention and by a panel study of knowledge and behavioral intention of the eligible women on certain maternal and newborn health issues. The data for the panel study was collected before beginning of the intervention i.e. at baseline and 5 months after the implementation of the intervention i.e. at endline.

#### *Sample size sampling procedure*

The eligibility criteria for households were presence of: (a) at least one family member as a member of a SHG, and (b) at least one married woman aged 18-49 years living in the household. To identify the SHG households, SHG record register of the RGMVP was used. Each SHG household was listed to identify the eligible households from the selected GPs in the intervention and control areas before the start of the intervention.

The baseline survey data of Manthan<sup>1</sup> project showed the level of knowledge on most of the MNCH behaviors (except skin to skin care) was about 35 percent among the poorer segment of population (Khan et al. 2012d). Assuming a 15 percent point increase in the level of knowledge at endline i.e. after 4 months of intervention, at 95 percent confidence level with 90 percent power and with design effect 1, the required sample size comes as 227. Adjusting for an estimated 10 percent non-response rate it became 252. Since there is a chance of dropouts in a panel study, with an assumption of 25 percent drop-out rate, the final sample size works out to be 336. It was rounded up to 340. Since the study has two arms, 680 women at baseline and those 680 women at endline to be interviewed to examine the impact of the intervention.

The formula used and assumptions made for sample size calculations are as follows:

$$n = \frac{\text{deft} * \{Z_{1-\alpha} \sqrt{2P(1-P)} + Z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)}\}^2 / (P_2 - P_1)^2}{(1-c)}$$

Where:

n= required sample size for each arm

Deft = design effect (taken as 1 in this case all GPs having SHG were considered in the sampling frame. Therefore, design effect 1 is considered.)

P1 = the estimated proportion in the experimental area at baseline (considered as 35 percent)

P2 = the estimated proportion in the experimental area at endline, such that the quantity (P2-P1) is the size of the magnitude of change it is desired to be able to detect (considered as 50 percent)

P =  $(P_1 + P_2) / 2$

$Z_{1-\alpha}$  = the Z-score corresponding to the probability with which it is desired to be able to conclude that an observed change of size (P2 - P1) would not have occurred by chance (Type I error) (considered as 1.96 at 95 percent confidence level)

$Z_{1-\beta}$  = the Z-score corresponding to the degree of confidence with which it is desired to be certain of detecting a change of size (P2 - P1) if one actually occurred (Type II error) (considered as 1.28 for 90% power)

C = correction factor adjusting for response rate, here 0.9 (over the non-response rate of 10%)

A team of about 20 investigators were recruited for the HH listing. The listing took about 20 days to complete. The house listing schedule (given in Appendix A) consisted of four columns. These were:

1. Name of the head of household
2. Is there any currently married women aged 18-49 years in the household?
3. Note name of all currently married women aged 18-49 years in the household
4. Is the woman currently a member of SHG?

<sup>1</sup> The Manthan Project was conducted by Intra Health International in partnership with PC to provide technical assistance to the Government of UP. The aim of the project was to improve maternal and newborn health (MNH) under India's NRHM. One of the major activities in this project was to demonstrate and document strategies to expand evidence-based MNH interventions in two districts of UP - Jhansi and Bahraich. As a part of evaluation of this project a baseline survey of MNH behaviors was conducted among the women of two study districts.

If the selected household had more than one eligible woman, one of them was selected at random. During the house listing for the quantitative survey 1,695 households in Bangra block and only 569 households in Baragaon were found eligible. At the start of the project the study was designed as a pre-post cross-sectional study and the required sample size was 575 for each study arm. Therefore for the control area, the independent sample at two time points i.e. at baseline and at endline would become equivalent of a panel sample. In view of these, it was more rational to conduct a panel study for the evaluation of the intervention. Moreover, experts from FHI 360 and PC visited the two study blocks and also came up with the suggestion of changing the study design from a cross-sectional to a panel study. Following the revised design the required sample size was reduced to 340 for each study arm.

At the baseline survey 803 women were interviewed, of them 446 were from experimental area and 357 were from control area. At the endline survey all the households were visited. However, for various reasons a fairly large number of the women were not available for the interview at the endline survey, therefore, 470 women were participated in the endline survey. Of these 233 women were from experimental arm and 237 women from the control arm. The major reasons for non-participation were unavailability of the participants at home during the harvesting time, and engagement with family and social events related to the yearly autumn festival.

Eligible women in the selected SHG households were interviewed to measure changes in their knowledge and intention to adopt the target behaviors, which included:

- ANC check-ups,
- clean cord care and thermal care,
- early breastfeeding,
- use of contraceptive methods, and
- uptake of services at the VHSND and from an ASHA.

The study also assessed whether eligible women received any health/family planning related message from any health workers or SHG *Swasth Sakhi* or elder family members who often attend SHG sessions and discuss with others or from any other sources.

An assessment of the change in knowledge of the *Swasth Sakhis* due to intervention was done by measuring their level of knowledge at two time points - before training and, after training. There were 52 *Swasth Sakhis* who participated in a small survey before and after the training. The same set of questions were asked at both the time points to evaluate the change in the knowledge level of the *Swasth Sakhis*.

### *Data collection and data management*

Population Council's own staff conducted the quantitative data collection. Two teams each consisting of six female investigators were formed. Each team had a supervisor to facilitate and monitor the day-to-day work. The district coordinator of the study supervised the overall data collection activity. PC researchers did regular visits to monitor the data collection activities. A semi-structured questionnaire was administered for interviewing women in the study area. The questionnaire was bi-lingual -- in English and Hindi. In order to save time in data coding and data entry, computer assisted personal interviewing (CAPI) technique was employed in data collection using mini-laptops. The data entry package was developed in CPro software to reduce the chance of entry error to a large extent with appropriate checks and logics. Prior to main fieldwork, all the investigators and supervisors were given a 7-day training. The training consisted of: (a) an overview of the study objectives, (b) woman's questionnaire, (c) classroom mock practice, (d) field testing, (e) de-briefing of the points emerged in the field, and (f) research ethics. After the training the bi-lingual questionnaire was

loaded in the laptops and was tested in a real field setting, although in an area different from the study area.

The interview was conducted using the questionnaire installed in the mini laptops. Every-day the data was sent through email by the supervisors of each team to the PC researcher. Programming proper skips and logics in CSPro reduced the inconsistency and validity of the data. Yet if any inconsistency was observed, it was reported to the supervisors for clarification and correction if necessary. The text responses given for “other (specify)” and were recoded later.

To keep the data anonymous, names were not written on any questionnaire, rather each respondent were assigned a unique identification number. All data and the recorded qualitative information were kept in a password-protected computer.

### Analysis plan

The following analyses were done to satisfy the objectives of the study:

1. Univariate descriptive analysis like frequency, percentages, mean, and standard deviation were computed.
2. To examine the similarity of background characterizes of the followed-up and dropped-out participants of both experimental and control areas, Z-test/ t-test were calculated.
3. Further, comparison of background characteristics of the followed-up participants in experimental and control areas were done using Z-tests/ t-tests.
4. The following analyses were done to fulfill the 1<sup>st</sup> objective:
  - a. Analyses of knowledge related variables were done in terms of dichotomous variable – ‘correct’ knowledge vs. ‘incorrect’ knowledge. For example, the question on “What is the minimum number of antenatal check-ups required to ensure a healthy pregnancy?” The correct answer to this question is at least 4 ANC. During analysis, proportion of women who answered 4 ANC was calculated. Further, the change in this proportion of women with correct knowledge over two periods at baseline and endline were calculated to examine the impact of intervention.
  - b. For those variables having more than one correct answer, number of correct answer given by the respondents were counted and average was calculated. For example, if on an average women knew about 1 danger signs during pregnancy in baseline and in endline if the average is found to be 2 that indicated a positive change.
5. The change in the correct knowledge for experimental and control group were examined using McNemar tests and paired-t test to account for the correlation of responses in two time points from the same individual.

Figure 6: Quantitative Data Collection in Mini Laptops using CAPI



Photo credit: Praween K. Agrawal, Population Council

6. The net change in knowledge and its significance was calculated using difference-in-difference (DID) analysis. The DID analysis was done using the following:

	S = 2 (Study arm- Experimental)	S = 1 (Study arm- Control)	Difference <sub>s</sub>
t = 2 (Endline)	$Y_{22}$	$Y_{12}$	$Y_{22} - Y_{12}$
t = 1 (Baseline)	$Y_{21}$	$Y_{11}$	$Y_{21} - Y_{11}$
Difference <sub>t</sub>	$Y_{22} - Y_{21}$	$Y_{12} - Y_{11}$	Net Change or DID = $(Y_{22} - Y_{21}) - (Y_{12} - Y_{11})$

Level of the significance of DID will be tested through a regression analysis

$$Y = a + b_{1s} + b_{2t} + b_{3s*t}$$

Where:

Y = dependent variable

a = constant

s and t are study arm and time, respectively

$b_1$  and  $b_2$  are slopes for study arm and time, respectively

$b_3$  = treatment effect

s\*t is a dummy variable indicating treatment status

The <0.05 p-value for treatment effect indicated the significant DID

7. To fulfill the 2<sup>nd</sup> objective Generalized Estimation Equation (GEE) analyses were done. In this analysis presence of 'correct' knowledge (for individual knowledge topic) was considered as dependent variable. Individual identity code for each of the participants was considered as 'subject variable', the 'time' (dichotomous variable: baseline vs. endline) were considered as 'within-subject variable' to account for correlation in responses between baseline and endline. The independent variables for the analysis were study arm, time, different background characteristics and an interaction variable between study arm and time (denoted as study arm \* time).
8. Comparisons of knowledge of *Swasth Sakhis* before and after the training were done using paired-t tests and McNemar tests to account for the correlation between the answers.
9. All these analyses were done using SPSS software (Version 18.0).

## Qualitative assessment

Qualitative IDIs were conducted to understand the process of the intervention, whether it is helping SHG families and how, difficulties faced, better strategies that may work, and so on. A total number of 16 IDIs were conducted. Eight SHG members, six *Swasth Sakhis*, and two RGMVP staff (N=2) were interviewed in depth using a brief guideline. All qualitative information collected through IDIs was recorded using voice recorders. Trained research investigators under the supervision of PC researchers prepared the transcripts of the interview in Hindi. The transcripts of all the IDIs were then coded for analysis.

## Ethical considerations

PC's technical and program staff reviewed the study proposal internally both for technical soundness and ethical quality. A separate ethical approval was received from a local ethical review board besides the technical Institutional Review Board of FHI 360. All participants of the study, both in experimental and control area were informed in detail about the purpose of the study before beginning the interview both at baseline and endline survey. The consent form was read in Hindi, as it is the principal language of the study area and thereafter consent was received.



# RESULTS

In this section, the key findings from the data collected, during the monitoring visits and in the baseline and endline surveys, to evaluate the outcomes of the study, are presented. The changes in the knowledge of maternal and newborn health and possible determinants to these changes have also been examined among the women from SHG households of the study area.

## FINDINGS FROM MONITORING OF INTERVENTION ACTIVITIES

The monitoring visits were concentrated in the intervention area, i.e. Bangra block. The prime purpose was to observe how the intervention was being implemented, in two ways. Observations were made to see whether the SHG meetings were being held as planned, and the process of conducting the health sessions and topics covered. A semi-structured checklist was prepared to observe the session in a systematic manner, yet providing an opportunity to note down significant observations and quality of counseling made by the *Swasth Sakhi*. The project coordinator, posted in Jhansi, carried out all the monitoring visits and reported the observations on a weekly basis to the Co-PI of the study in New Delhi. The Co-PI also made frequent visits to the field, both to collect firsthand information on progress and provide supportive supervision and feedback to the project coordinator.

**TABLE 1: Details of the SHG meetings observed in intervention area (Bangra) during study period**

Characteristics	n	Percentage
Types of SHG meetings		
SHG meetings	37	75.5
Village Organization meetings	4	8.2
Block Organization meetings	8	16.3
Average duration of SHG meetings Mean $\pm$ SD	2 h 34 m	$\pm$ 56 m
Average duration of health discussion in SHG meetings Mean $\pm$ SD	1 h 35 m	$\pm$ 34 m
Average number of health topics discussed in SHG meetings Mean $\pm$ SD	7.8	$\pm$ 3.4
<b>Total number of meetings attended = 49</b>		

## Observation of SHG meetings

A total number of 49 meetings were observed (Table 1). Most were SHG meetings (76%). Average duration of SHG meetings was two and a half hours, with average duration of discussion on health issues was one and a half hours. The other activities in the SHG meeting were regular prayer at the start of the meeting and the discussion on micro financing. However, spending 60 percent of the total duration of the meeting on discussing health reflects the interest of the SHG members in health issues.

The qualitative interviews of *Swasth Sakhi* also confirm this finding as a *Swasth Sakhi* said:

*“ Members of the SHG are keenly interested in the health session as reflected by their participation in the discussion on health issues. Many of them have adverse happening in their family such, as they were not able to handle properly and timely some complication in case of mother and newborn, could not recognize danger sign or similar other problems. They now realize that had they knew about all these earlier, they could do have faced those problems in better way. ”*

It is also worth mentioning that weekly SHG meetings were not regular in most GPs. To address this problem, RGMVP staff organized many of the SHG meetings with focus on health, besides their normal functioning. In these meetings, often more than two SHGs were invited and the number of participants was more than the usual SHG meetings, which normally consist of 10 to 12 SHG members.

## Observation of the discussion of health issues in SHG meeting

The findings of the structured observation of the health discussions in SHG meetings are presented in Table 2. A total of 30 health discussions by *Swasth Sakhis* were observed. There were 12 key health messages as a part of this intervention study. Those included: 1) importance of four ANC check ups, 2) TT injection, 3) anemia and iron and folic acid (IFA) tablets, 4) danger signs during pregnancy, 5) PNC check up, 6) danger signs in newborns, 7) thermal care including delayed bathing and Kangaroo Mother Care (KMC), 8) cord care, 9) early breastfeeding, 10) return of fertility, 11) family planning goal, and 12) choice of contraceptive method. The key points of observation included: what topics were covered in the session, whether *Swasth Sakhi* explained the messages, and whether she used the flipbook given by Population Council to explain the messages and reinforce them.

**TABLE 2: Characteristics of the SHG meetings in intervention area during study period (N=30)**

Key messages	Message given	Explained the significance of message	Used flipbook for reinforcement
	%	%	%
4 ANC check-ups	71.0	67.7	45.2
TT injection	64.5	64.5	45.2
Anemia & IFA tablets	64.5	64.5	41.9
Danger signs of pregnancy	64.5	61.3	45.2
PNC check-up	77.4	77.4	58.1
Danger signs of newborn	80.6	77.4	61.3
Thermal care	74.2	74.2	64.5
Cord care	74.2	74.2	64.5
Early breastfeeding	80.6	77.4	64.5
Return of fertility	35.5	32.3	16.1
Family planning goal	32.3	32.3	16.1
Choice of contraceptive	35.5	35.5	20.0

The table shows that some messages like danger signs of the newborn (81%), early breastfeeding (81%), PNC check ups (77%) were discussed more frequently than other topics. Some topics, especially topics related to family planning were discussed less frequently such as return of fertility (36%), family planning goal (32%), and contraceptive choice (36%). In rural UP, talking about family planning is still taboo and not openly discussed in public, particularly if the discussion is on specific contraceptive methods and their use. Similarly, discussion of maternal health care seems to be less important than newborn care, which was the most frequently discussed topic. This finding shows the importance of having reorientation sessions with *Swasth Sakhis* on how they can initiate discussion on these issues.

The observer also rated each observed health discussions as 'poor', 'average' and 'good' based on seven criteria: 1) use of the flipbook, 2) gave the complete message, 3) explained the importance of the message, 4) reinforced the message, 5) used examples, 6) satisfied SHG members' questions in general, and 7) encouraged questions. If less than four criteria were fulfilled, the health discussion was rated as 'poor'. If at least four criteria were satisfied, the discussion was considered 'average'. If at least six criteria were satisfied, the discussion was rated 'good'. Overall, 17 meetings (53%) were rated 'good', 10 meetings (37%) were rated 'average', and three meetings (10%) were rated 'poor'. The frequencies of the quality criterion captured from the health discussion are presented in Table 3.

In the BO and VO meetings, *Swasth Sakhis* and VO members were trained on the importance of conducting discussions on health issues by the RGMVP staff. One of the observations in a BO meeting reported:

**TABLE 3: Frequency of quality criteria in health discussions in intervention area (Bangra) during study period (N=30)**

	n	%
Used flipbook	27	90.0
Gave complete message	27	90.0
Explained the importance	20	66.7
Reinforced message	20	66.7
Used examples	21	70.0
Satisfied questions	17	56.7
Encouraged questions	7	23.3

*“Institution Building and Capital Building staff of RGMVP reiterated the importance of the role of Swasth Sakhi to improve the knowledge level of the SHG members. She also discussed the strategies that Swasth Sakhis can use for the smooth discussion of health in SHG and VO meetings.”*

In a Village Organization meeting it was reported,

*“The Regional Program Executive of RGMVP used a flipchart to explain the participants how the Kangaroo Mother Care or Skin-to-Skin care can be given to a newborn child. He also explained the importance of giving clean cord care, colostrum feeding, and danger signs of newborn.”*

## FINDINGS FROM QUANTITATIVE SURVEY

The evaluation of the study was done at different levels: change in *Swasth Sakhi* knowledge levels, change in eligible women's knowledge of maternal and newborn health issues in a panel study with baseline and endline surveys of eligible women in SHG households, and changes in SHG functioning and health discussion in meetings.

## Swasth Sakhi knowledge levels

To measure the effect of training on the knowledge of maternal and newborn health among *Swasth Sakhis* their knowledge before and after training was measured and compared. This comparison is presented in Table 4. Before the start of training and after training, 52 *Swasth Sakhis* participated in two small surveys. The same set of questions was asked in both surveys.

Table 4 shows significant improvement in knowledge level from before training to after training for all of the maternal and newborn health topics. During the endline survey, i.e. after completion of the study, an attempt has been made to interview the *Swasth Sakhis* one more time using the same questionnaire, which was used before and after the training to test the retention of their knowledge. However, many *Swasth Sakhis* were not available for interview in their homes. After repeated visits, we could able to contact 23 *Swasth Sakhis*. Their knowledge scores on all these health aspects were not significantly different to the post training scores, indicating that most of the health messages have been assimilated and remembered well.

**TABLE 4: Comparison of knowledge level of *Swasth Sakhis* about mother and newborn health related topics at pre-training and post-training**

Health topics	Pre training	Post training	Pre vs. post
	N=52	N=52	P-value of McNemar test/ Paired t-test
4 ANC check-ups, %	32.7	92.3	0.007
Number of ANC test recalled, Mean (SD) <sup>a</sup>	4.1±1.3	4.9±0.6	3.65, 0.001
Number of danger signs in pregnancy, Mean (SD) <sup>a</sup>	5.4+1.9	6.3+1.2	3.08, 0.003
2 TT injections during pregnancy, %	44.2	96.2	<0.001
100 IFA tablet consumption during pregnancy, %	48.1	98.1	<0.001
Timing of first PNC check-up within 24 hour, %	61.5	90.4	<0.001
Number of at least 3 PNC within 7 days, %	30.8	86.5	<0.001
Number of danger signs in pregnancy, Mean (SD) <sup>a</sup>	5.1+1.9	5.2+1.9	0.53, 0.598
Early breastfeeding, %	82.7	94.2	<0.001
Nothing should be applied on cord, %	23.1	100.0	<0.001
Keep the cord clean and dry, %	15.4	36.5	<0.011
Delayed bath > 48 h, %	67.3	98.1	<0.001
Heard of STSC/KMC, %	50.0	96.2	<0.001
Return of fertility after 6 weeks of childbirth, %	9.6	78.8	<0.001

<sup>a</sup>Paired t-test was applied

## Women's knowledge levels

A total number of 803 eligible women, 446 from the experimental area and 357 from the control area, participated in the quantitative survey before the intervention. Of these, 233 women from the experimental area and 237 women from the control area took part in the follow up survey at the end of the study using the same set of questions with few additional questions on use of flip book and usefulness of the messages given. The background characteristics of the participants in the baseline and endline surveys are presented in Table 5. No significant difference was found for any of the background characteristics of the participants interviewed both at the beginning and at the end of the study or those who were followed up and dropped out. This helps ensure that the participants at the endline survey were a representative subsample of the participants of the original baseline survey and the dropouts were not from a result of selection bias.

### Background characteristics of participants

The average age of the participants of the experimental area was 32 years and for the control area was 34 years (Table 5). Participants were mostly Hindus. About two thirds of participants belonged to scheduled castes or scheduled tribes in both the experimental and control groups. Around one fourth of participants did not have any education, half had primary education, and the rest (about one fourth) had completed 10<sup>th</sup> standard or higher. The wealth index, an indicator of economic status, was calculated by using a standard set of questions on household assets at baseline. The wealth index of participants shows that a larger proportion (45%) in the experimental arm belonged to lower levels than in the control (26%). The mean number of children ever born per women was lower in the experimental arm (3.4) than the control (3.7).

**TABLE 5: Background characteristics of the respondents at the baseline and the comparison between follow-up and drop out respondents**

Background characteristics	Experimental			Control			P value of Z test/ t-test between follow-up and drop out for experimental arm	P value of Z test/ t-test between follow-up and drop out for control arm	P value of Z test/ t-test of follow-up respondents between two study arms
	Baseline	Follow-up	Drop out	Base-line	Follow-up	Drop out			
	N=446	N=233	N=213	N=357	N=237	N=120			
<b>Age</b> (Years), Mean(SD)	32.0 (8.9)	31.8 (8.9)	32.1 (9.0)	34.3 (9.1)	34.3 (8.9)	34.2 (9.6)	0.72	0.92	0.002
<b>Religion, %</b>									
Hindu	94.2	94.0	94.4	100.0	100.0	100.0	0.86	-	-
Muslim	5.8	6.0	5.6	-	-	-	0.86	-	-
<b>Caste/ tribe, %</b>									
Scheduled caste (SC)	45.3	41.6	49.3	43.1	40.5	48.3	0.10	0.64	0.81
Scheduled tribe (ST)	21.5	24.9	17.8	18.8	20.7	15.0	0.07	0.67	0.28
Other backward classes (OBC)	27.6	26.6	28.6	31.4	33.3	27.5	0.64	0.72	0.11
General	5.6	6.9	4.2	6.7	5.5	9.2	0.21	0.65	0.53
<b>Education status, %</b>									
No education	18.2	20.2	16.0	21.6	21.1	22.5	0.25	0.91	0.81
Primary (up to 5 <sup>th</sup> standard)/ read & write)	52.5	51.1	54.0	57.7	57.8	57.5	0.54	0.99	0.14
Secondary (10 <sup>th</sup> standard)	22.6	22.3	23.0	15.1	15.6	14.2	0.86	0.90	0.06
Higher secondary (12 <sup>th</sup> standard) and above	6.7	6.4	7.0	5.6	5.5	5.8	0.80	0.97	0.68
<b>Wealth Index, %</b>									
Low	40.4	44.6	37.7	24.4	26.2	20.8	0.14	0.71	<0.001
Middle	31.6	30.0	33.3	35.6	34.2	38.3	0.45	0.79	0.33
High	28.0	25.3	31.0	40.1	39.7	40.8	0.18	0.94	<0.001
<b>Number of children ever born, Mean (SD)</b>	3.3 (2.0)	3.4 (2.0)	3.2 (1.9)	3.6 (1.9)	3.7 (1.9)	3.3 (1.9)	0.28	0.06	0.10

### Knowledge of maternal and newborn health

The knowledge of maternal and newborn health among women of the study area has been presented in Table 6. Comparison of knowledge level from baseline to endline among women of the experimental arm showed significant increase in correct knowledge for: 1) importance of ANC, 2) two TT injections during pregnancy,

3) 100 IFA tablet intake during pregnancy, 4) number of danger signs during pregnancy and for newborn, 5) delayed bathing for more than 48 hours, 6) heard of KMC, and 7) return of fertility after childbirth.

**TABLE 6: Comparison of knowledge of mother and newborn health in respondents in both study groups at baseline and endline**

Background characteristics	Baseline		Endline		Net effect (Difference-in-difference) (E2-E1)-(C2-C1)
	Experimental (E1)	Control (C1)	Experimental (E2)	Control (C2)	
	N=233	N=237	N=233	N=237	
<b>Knowledge on maternal health</b>					
Importance of ANC, %	85.0 <sup>a</sup>	92.8	93.6 <sup>a</sup>	90.7	10.7*
At least 4 ANC check-ups, %	25.8 <sup>a</sup>	19.8	32.2 <sup>a</sup>	24.9	1.3
2 TT injections required, %	18.0 <sup>a</sup>	27.4	32.6 <sup>a</sup>	27.0	15
Minimum 100 IFA tablets need to be consumed, %	24.9 <sup>a</sup>	31.6	36.9 <sup>a,b</sup>	26.2 <sup>b</sup>	17.4*
First PNC check-up for mother within 24 hours, %	30.0 <sup>a</sup>	40.5	34.3 <sup>a</sup>	32.1	12.7*
Number of danger signs during pregnancy, Mean (SD)	0.9 (1.0) <sup>a</sup>	1.9 (1.2)	1.6 (1.4) <sup>a</sup>	1.6 (1.4)	1.1*
<b>Knowledge on neonatal health</b>					
First PNC check-up for child within 24 hours, %	40.8 <sup>a</sup>	49.4	41.6 <sup>a</sup>	39.7	10.5
Number of at least 3 PNC check-ups within 7 days, %	17.2 <sup>a</sup>	16.9	22.3 <sup>a</sup>	17.7	4.3
Number of danger sign of newborn, Mean (SD)	0.9 (0.9) <sup>a</sup>	1.9 (1.2)	1.5 (1.2) <sup>a</sup>	1.4 (1.2)	1.1*
Early breastfeeding, %	68.2 <sup>a</sup>	71.3	70.4 <sup>a</sup>	67.1	6.4
Nothing should be applied on cord, %	15.5 <sup>a</sup>	19.0	21.0 <sup>a,b</sup>	9.3 <sup>b</sup>	15.2*
Keep the cord clean and dry, %	17.2 <sup>a</sup>	24.1	14.2 <sup>a,b</sup>	7.2 <sup>b</sup>	13.9
Delayed bath > 48 h, %	38.6 <sup>a</sup>	32.1	37.3 <sup>a,b</sup>	24.9 <sup>b</sup>	5.9
Heard of KMC, %	20.4 <sup>a</sup>	38.8	33.5 <sup>a,b</sup>	21.1 <sup>b</sup>	30.8*
Correct method of KMC, %	6.4 <sup>a</sup>	20.7	22.7 <sup>a,b</sup>	15.6 <sup>b</sup>	21.4*
Return of fertility after 6 weeks, %	10.7 <sup>a</sup>	11.8	17.6 <sup>a</sup>	12.2	6.5

**Note:** <sup>a</sup> Significant difference in experimental arm between baseline and endline ( $p < 0.05$ , McNemar test/ paired t-test)

<sup>b</sup> Significant difference between experimental and control arm at endline ( $p < 0.05$ , Z-test/ independent sample t-test)

\* Significant difference in net effect (difference-in-difference),  $p < 0.05$

At endline, significantly higher percentage of correct knowledge was also reported for 100 IFA tablet consumption during pregnancy, cord care, delayed bathing, and KMC among women of the experimental area compared to the control area. The net increase, calculated by taking difference of the difference i.e. (E2-E1) – (C2-C1), in knowledge levels were reported for all outcome variables in the last column of the table. Difference-in-difference analysis revealed a significant net increase in knowledge for importance of ANC, consumption of 100 IFA tablets during pregnancy, first PNC check up for mother within 24 hour of childbirth, danger signs during pregnancy and for newborn, and KMC.

#### *Knowledge of danger signs for pregnant women and for newborn*

To examine the change in the knowledge of individual danger signs for pregnant mothers and newborns, the percentage of women with correct knowledge of each danger sign is presented in Table 7. Knowledge of danger signs for pregnant women such as severe headache, blurred vision, swelling of hands and feet, vaginal discharge, and absence or less movement of fetus significantly improved from baseline to endline among women in the experimental area compared to the control area. Net changes in knowledge of some key danger

sign such as high blood pressure, convulsion, excessive vaginal bleeding, and high fever were not significant. Less than 30 percent of women reported knowing any danger signs at all, however, so it is necessary to give special attention to danger signs for women during pregnancy in any future intervention.

**TABLE 7: Knowledge of danger signs for pregnant women and newborn child**

Danger signs	Baseline		Endline		Net effect (Difference-in-difference) (E2-E1)-(C2-C1)
	Experimental (E1)	Control (C1)	Experimental (E2)	Control (C2)	
	N=233	N=237	N=233	N=237	
<b>Danger signs for pregnant woman</b>					
Severe headache	15.0	27.4	24.5	15.6	21.3*
Blurred vision	3.4	14.8	5.2	3.8	12.8*
High blood pressure	4.7	1.7	2.1	1.7	-2.6
Severe swelling of feet / hand	12.9	41.8	29.2	19.0	39.1*
Convulsions	0.4	2.1	5.6	4.2	3.1
Excessive vaginal bleeding	14.6	23.6	21.9	31.2	-0.3
Vaginal discharge	10.7	21.5	27.9	29.1	9.6*
High fever	14.6	28.3	19.7	25.3	8.1
Absence / less movements of fetus	10.7	30.8	21.9	26.2	15.8*
<b>Danger signs for newborn child</b>					
Poor sucking or feeding / breastfeeding	11.6	32.9	19.0	21.1	19.2*
Redness and discharge around the cord	4.3	8.4	8.7	5.1	7.7*
Difficulty in/fast breathing	6.0	20.7	10.0	7.2	17.5*
Hypothermia/shivering	37.3	49.8	52.8	53.2	12.1
Baby becoming drowsy / unconscious	11.6	30.4	19.7	19.4	19.3*
Baby very small / low birth weight	2.6	16.5	8.2	8.0	14.1*
Baby does not cry	5.2	11.8	15.9	9.7	12.8*
Chest drawing in	11.2	16.9	8.2	11.0	2.9
Congenital malformation	0.4	4.6	3.9	3.4	4.7*

**Note:** \* Significant difference in net effect (difference-in-difference),  $p < 0.05$

Knowledge of most newborn danger signs such as poor sucking or breastfeeding, redness around cord, breathing difficulty, infant unconsciousness, low birth weight, and baby not crying markedly improved from baseline to endline among women of the experimental area. In some cases such as knowledge of hypothermia and chest drawing in, net increase was not significant. Except for hyperthermia, less than 30 percent of women were able to recall any newborn danger sign at endline. Although the intervention showed some significant net increase in knowledge, overall knowledge remained poor, because a majority of women could not answer correctly. One important reason for this could be a relatively too short intervention—just four months. In the future, the importance of newborn danger signs should be given focus in interventions. The health discussion on knowledge level of danger signs was also reported in qualitative interviews as well.

SHG member who was pregnant, 25 years old:

*I: In the last two months, what were those messages the Swasth Sakhi give you any health related messages in SHG meeting?*

*R: She told me to contact the ASHA when you are pregnant. And if I get ill I should contact ASHA, I should go to a hospital. I need to take 4 check-ups (antenatal). She also told me about the danger signs during pregnancy and also for the newborn child. She talked about the kangaroo method as well*

.....

*R: Earlier we used to put coal on the cord stump of the child. Now from your information, i.e. nothing should be applied, the child will be protected and it is good for us as well. If we could know it earlier, we would not have given goat milk to the newborn. Now we will only feed the breast milk.*

SHG member and newly mother, 18 years old:

*I: Please tell us some health messages you received from the Swasth Sakhi?*

*R: She told me that if you are pregnant you need to take two injections of TT ... you need to eat 100 tablets (of IFA).*

*R: My child is now two months old. I feed the child only breast milk. I don't feed her anything other than breast milk.*

....

*I: How did you convince the old people in family for your improved behaviors?*

*R: I shared the information that Swasth Sakhi has given to me to my mother-in-law. I told her all those information like wrapping the baby in warm cloths, kangaroo methods, breastfeeding, etc. So she agreed to change our old practice. So I was able to change my behaviors.*

SHG member. 22 years old:

*I: Did the Swasth Sakhi of your SHG inform you about contraceptive methods?*

*R: Yes. She told me about contraceptive methods. She was telling me that if I don't want child I may use condoms. She also told me that if we don't want to use condoms there are other contraceptive methods available such as I may take pills [oral contraceptive pills].*

However some old practices still prevail:

SHG member, 18 years old:

*I: How many days after delivery was the child given the first bath?*

*R: As soon as the baby was born I have given the first bath. I don't know when the first bath to be given or not. When I came back to home from hospital my family members cleaned the baby by giving it a bath then wrapped it by clean cloth.*

SHG member, mother of a newly born child. 25 years old:

*I: After the birth of the child when did you start breastfeeding?*

*R: I feed breast milk after four days of the delivery of the child... I think we should not start breastfeeding before that. I started the breastfeeding when the milk started flowing from my breast, not before that. Till then I gave the baby animal milk.*

### *SHG functioning and health discussions*

The data on the characteristics of SHG functioning and the discussion of health issues were collected from SHG members only. A total of 217 women were interviewed from the intervention area and 232 from the control area. A probing on regular weekly meeting of the SHG supported the earlier observation that the SHGs were not regularly organizing the weekly meetings. About half of the respondents of the experimental area both at baseline and endline reported that in the last two months they did not attend any regular SHG meetings. This was still poorer in case of control area where the percentage of respondents reporting 'no meeting' increased from 27 percent at baseline to 49 percent at endline. Around one fifth of respondents reported attending four or more SHG meetings in the last two months.

In the experimental area, slightly less than two thirds of respondents reported no discussion of health issues in their regular SHG meetings. About 22 percent of respondents reported one to two meetings in which health issues were discussed while in approximately 16 percent in the last two months some discussion on health was reported. Although we were not expecting any health discussion in the control group, about one fourth of respondents mentioned some discussion on health, which they generally discuss depending on incidences of the health problems in the community, but not necessarily on maternal or newborn care.



During IDIs irregularity of attending weekly SHG meeting revealed that, many times, meetings were held, but as respondents did not attend they did not know whether any meeting was held or not. Primary reasons for not attending included, working on their own farms, working as laborers, or visiting parents or families. During harvesting and swing session few women are able to attend SHG meetings. SHG members, however, continue to contribute monthly by visiting the *Pradhan* (president) of the SHG and paying their dues. Informal discussions with a regional RGMVP members further reveal that if any GP, VO has not been formed, SHG functioning is not properly monitored and thus do not regularly organize weekly meetings. In the words of an RGMVP staff member at Jhansi:

*“In those areas where our village organization is not functional, our SHGs are not running smoothly. Our workers are not being able to reach them. That is why the SHGs are not functioning well. But there are some other reasons as well. Some people from private financial agencies discourage them (the villagers) and cheated them as well. Because of these, some people think RGMVP too will do the same with them.”*

With all these limitations, the good news was that at least 50 percent of respondents reported regular SHG meetings. At the same time, at least 38 percent reported health discussions and 28 percent reported use of flip books in their SHG meetings.

### *Intention of maternal and newborn health behavior*

To examine the change in the intention of behavior related to maternal and newborn health the women were asked questions on their intention for behaviors both at the baseline and at the endline. The net changes in intentions were noticed for prior arrangement of transports, and prior identification of health facility to handle the complications during pregnancy. For newborn health intention of wrapping the baby with dry cloth and early breastfeeding showed significant net change. Although delayed bathing for more than 2 days and exclusive breastfeeding showed positive net change but those were not statistically significant.

**TABLE 8: Intention of behavior related to maternal and newborn health**

Danger signs	Baseline		Endline		Net effect (Difference-in-difference) (E2-E1)-(C2-C1)
	Experimental (E1) N=233	Control (C1) N=237	Experimental (E2) N=233	Control (C2) N=237	
<b>Intention of prior arrangement for pregnancy complications</b>					
Arrangement of transport	57.1	88.6	60.1	45.6	46.0*
Health facility identification	16.3	23.2	18.0	14.3	10.6*
Arrange of money	10.3	10.5	30.9	31.2	-0.1
<b>Intention of behavior related to newborn health</b>					
Wrap baby with dry cloth	23.6	52.3	40.3	37.6	31.4*
Early breastfeeding	15.5	38.4	27.5	29.1	21.3*
Delayed bathing > 2 days	10.7	20.3	6.0	7.2	8.4
Exclusive breastfeeding	11.6	26.2	9.4	12.2	11.8

**Note:** \* Significant difference in net effect (difference-in-difference),  $p < 0.05$

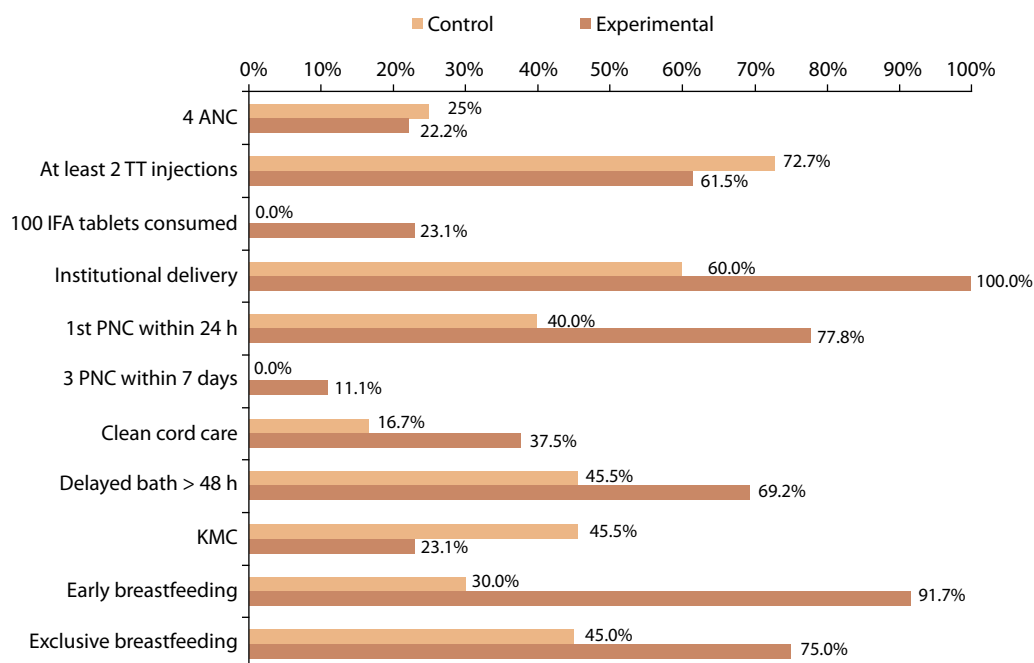
### *Maternal and newborn health behavior*

Women who delivered a child in the two months prior to the endline survey were interviewed for maternal and newborn health related behaviors they practiced during their last pregnancy and after delivery. Figure 7 shows the reported behaviors of those women and comparisons were done between women of the experimental and control areas. The data on maternal and newborn health behaviors were collected from 24 women, of those 13 women were from the experimental area and 11 women were from the control area.

Figure 7 shows that improved behaviors among women of the experimental area in consumption of 100 IFA tablets, institutional delivery, first PNC check up within 24 hour of child delivery, three PNC check-ups within seven days of child delivery, clean cord care, delayed bathing for more than 48 hours of child birth, initiation of breastfeeding within an hour of child birth, and exclusive breastfeeding i.e. not feeding the child anything other than mother's breast milk. However, behaviors like receiving at least four ANC check-ups, at least two TT injections during pregnancy, and giving KMC/STSC to the child were practiced more among women of the control area.

Although this result showing improved behaviors in experimental area but none of the differences was statistically significant. It should be taken with caution as the outcome is based on a very small number of sample and without any baseline data to see the extent of change. However, the consistency in higher correct practices in the experimental area gives some confidence that in the long term such an intervention could make a significant difference in promoting healthy family behavior.

Figure 7: Maternal and newborn behavior of women who delivered a child within two months prior to endline survey



### Predictors of Outcome variables

Generalized estimation equation (GEE) analyses were done to identify which of the background characteristics or program related variables have an association with the program outcome, i.e. change in knowledge level (Table 9). In these analyses key outcome variables, i.e. knowledge level of maternal and newborn health, were considered as dependent variables whereas the background characteristics of the respondents and the SHG functioning variables were considered as independent variables. The GEE analysis showed significant positive relationship with change in knowledge with the interaction variable between study arms (i.e. experimental and control) and time points (i.e. baseline and endline). This indicates the intervention program were more effective in increasing the knowledge level of the experimental group from baseline to endline. The topics which showed increased effect of intervention were knowledge of TT injections, danger signs of pregnancy, danger signs of newborn, clean cord care, and KMC. The other significant predictors were higher secondary education (for 2 TT injections during pregnancy, early breastfeeding, and clean cord care), wealth index (for

importance of 100 IFA tablets consumption), secondary education (for danger signs during pregnancy and for newborn), and primary education (for KMC and return of fertility).

**TABLE 9: Generalized estimation equation analysis to examine the association of predictors variables and change in knowledge level**

Predictors	Change from baseline to endline in correct knowledge of:								
	4 ANC	2 TT	100 IFA	Danger signs of pregnancy	Danger signs for newborn	Early breast-feeding	Clean cord care	KMC	Return of fertility
	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio	Odds ratio
<b>Study Arm</b>	1.44	<b>0.48*</b>	0.83	<b>0.36*</b>	<b>0.37*</b>	0.95	0.67	<b>0.27*</b>	0.88
<b>Time-point</b>	1.42	1.02	0.85	<b>0.77*</b>	<b>0.60*</b>	0.87	<b>0.26*</b>	0.94	1.28
<b>Study Arm * Time-point</b>	1.00	<b>2.56*</b>	<b>2.10*</b>	<b>2.67*</b>	<b>2.97*</b>	1.25	<b>4.84*</b>	<b>4.94*</b>	1.49
<b>Age group</b>									
18-29 years	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
30-39 years	1.01	0.88	1.03	1.15	<b>1.24*</b>	0.77	1.42	1.51	1.15
40-49 years	1.07	<b>0.57*</b>	0.77	1.09	1.17	0.71	1.09	1.32	<b>1.89*</b>
<b>Caste/ tribe</b>									
SC	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
ST	0.83	1.44	0.98	0.83	0.96	1.31	0.90	1.09	0.80
OBC	0.77	1.11	0.91	1.05	1.06	1.37	0.78	0.75	0.69
General	1.82	0.96	<b>0.43</b>	0.84	0.94	1.16	0.91	<b>0.33*</b>	1.02
<b>Education</b>									
No education	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Primary	0.88	0.79	0.82	<b>0.73*</b>	<b>0.75*</b>	0.87	0.72	<b>0.51*</b>	<b>0.53*</b>
Secondary	1.18	0.83	1.26	0.95	0.99	1.07	1.23	1.67	1.26
HS &+	1.26	<b>2.56*</b>	1.91	1.46	1.33	<b>3.30*</b>	<b>2.30*</b>	1.94	0.58
<b>Wealth Index</b>									
Low	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Middle	1.06	0.86	<b>1.63*</b>	1.16	1.17	1.12	1.17	1.15	1.33
High	1.01	1.02	<b>1.61*</b>	1.14	1.21	1.05	1.17	1.02	1.24
<b>Number of SHG meeting in last 2 months</b>									
No meeting	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
1-3 meetings	0.70	0.98	0.95	1.17	1.08	1.26	<b>1.52*</b>	<b>3.03*</b>	1.13
4 and more meetings	1.20	0.89	1.26	1.13	1.03	1.3	1.15	<b>2.21*</b>	0.92
Use of counseling aid for health discussion	1.35	1.23	1.21	1.21	0.93	1.2	1.34	1.46	1.48

**Note:** \* p < 0.05, Ref. = Reference category

# DISCUSSION

The study aimed to examine whether the SHG platform can be used to deliver maternal and newborn health messages, or not, and to identify the factors those could facilitate the intervention. The existing federal structure of the RGMVP was used to disseminate the health messages among SHG members with the help of a group of peer educators within the SHG known as *Swasth Sakhi*. The findings of the study indicate the usefulness of the SHG platform in delivering health messages, as the net changes in knowledge level of the women were significant higher for most of the health messages. Still in a majority of cases (almost two thirds) respondents were unaware of the danger signs. This could be for two reasons—the intervention was of too short a duration (4 months) and more time is required for significant impact on the large community members, and in the study area, nearly half of SHG members did not attend meetings regularly, particularly where a VO has not been formed and thus weekly SHG meetings are not monitored. Although the intervention seems to work, it does not according to plan.

As the regular meetings, planned as four per month, were held less frequently, the RGMVP arranged special meetings to facilitate the intervention of health messaging. In those special meetings all SHGs of a village or *purva* were asked to participate, and one capable *Swasth Sakhi* of the GP trained by the Council was selected (generally by RGMVP staff) to deliver the health message/engage in discussion in that special meeting. Sometimes these meetings were also arranged as a part of village organization meetings. That explains why duration of health discussions was nearly one and half hours, longer than expected (anticipated as half an hour once or twice a month). Moreover, structured observation of the health discussions report that discussions on family planning and contraceptive use are less frequent. It is necessary to design future interventions to promote discussion on those topics.

Among the key determinants of knowledge change, the interaction variable between the study arm (experimental versus control) and time (baseline versus endline) showed significant results for change in knowledge of most maternal and newborn health topics. Increases in knowledge from baseline to endline were better in the experimental area than in the control, confirming the effectiveness of the intervention. The other significant key determinant was women's education, which indicates that women's education plays a big role in the success of any mother and newborn health intervention program.

The intention to act for some of the behaviors of maternal and newborn health showed significant net change, but the changes were not consistent for all the behaviors. In a very small sample, the behavior of recently (2 months prior to endline) delivered women was also measured. This also indicates that more women in the experimental area correctly practiced maternal and newborn health behaviors than women in the control area. The small sample size does not allow drawing a definite conclusion, but the consistency of better performance in the experimental group is worth noting.

The study had several limitations that need to be kept in mind for future intervention programs on maternal and child health using SHG platforms:

- The intervention was short, just four months. It was originally planned for six months. However, the approval process particularly ethical review and requirement by FHI 360 for local ethical review took quite some time leading to delay in starting of the project. For success in any behavior change communication program, even four months is a very short time for achieving any sustainable change. Even in this short time, however, the intervention produced some significant increase in women's knowledge in the experimental area compared to the control area.
- The results of both the baseline and endline surveys show that regular meetings were organized in the study area and women were not regularly attending meetings because of various factors. Although special meetings on health were arranged by the RGMVP to boost the health intervention in the experimental area, this raises questions for the program's sustainability. It is worth mentioning that the meetings were not arranged by the Council but the SHG development organization, RGMVP. RGMVP staff in the project area reported that those SHGs are in a nascent stage and need nurturing. Therefore, to mobilize existing SHGs they need to arrange VO meetings and invite all interested SHG members. The situation maybe different where SHGs are older and more mature, as observed in other parts of UP such as Raibarily, Amethi, or Sultanpur.
- *Swasth Sakhis* took part in a small survey of their knowledge of maternal and newborn health issues both before and after their training by the Council and showed significant improvement. Another survey after the intervention was planned and attempted but with poor participation, with only 23 *Swasth Sakhis*. The results do show that generally *Swasth Sakhis* assimilated the messages and were able to answer as effectively as immediately after their training. Because of big drop off in the post intervention survey, however, the survey results must be viewed with a high degree of caution.
- Although the experimental and control areas were in the same district, there were differences, in some respects. Women's economic condition in the control area was better than in the experimental area. To avoid this disparity, earlier it was planned to pair 20 GPs from each block and randomly allocate the GPs in experimental and control arms. Just before the start of the intervention, however, RGMVP decided to launch a similar intervention for a different project in the experimental area. To avoid contamination it was decided to change the study design to a pre-post experimental control design. It would have been better to use the random GP allocation in the experimental and control arms for more rigor.

Using RGMVP SHGs to disseminate health message to the poor and unreached is an innovative strategy. The study shows the potential of SHG platforms to deliver health messages to increase women's knowledge. The present study should be assessed as a pilot study with its lessons adapted for a larger intervention study before scaling it up to a larger area. The findings of this study leads to the following recommendations for the future scaled-up programs of social and behavior change communication.

- The intervention could have been more effective if the SHG of the selected block would have been matured and functioning well. In the future care should be taken to develop an intervention program with relatively older and well established SHGs to provide supportive supervision.
- The duration of such intervention, particularly for changing behaviors, must be at least two years. For a sustainable change in behavior change a longer intervention is necessary.
- Since most of the unreached communities did not have any formal education. Innovative communication should be done with more stress on audio-visual communication rather than written communication. The flipbook developed for this project was quite useful because of its pictorial presentation of the health topics.
- The SHG is a feasible platform to lunch behavior change communication using the community itself. RGMVP's SHG platform has great potential as a tool for behavior change communication because it is fast expanding in Uttar Pradesh.

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