Capsular Training on Skilled Birth Attendance: Lessons from an Operations Research Study in Bahraich District, Uttar Pradesh

September 2013

Background

Access to a skilled birth attendant (SBA) is critical for averting maternal and neonatal deaths. In line with the Government of India (GOI) guidelines, the Government of Uttar Pradesh (GOUP) rolled out a 21-day SBA training programme across the state to train Auxiliary Nurse Midwives (ANMs), Lady Health Visitors (LHVs), and Staff Nurses (SNs) posted in public health facilities as SBAs. However, interviews conducted in Bahraich district in 2011 revealed a wide gap between SBA clinical standards and trained providers' knowledge and skills. ANMs, trained as SBAs, lacked knowledge and awareness about SBA guidelines for delivery and newborn care as well as life-saving obstetric practices such as active management of third stage of labour (AMTSL).

The poor knowledge and skills of trained SBAs raised the possibility of either 1) poor quality of the 21-day training as implemented or 2) poor design of the training programme as structured. In this context, the Manthan Project, led by IntraHealth International and funded by the Bill & Melinda Gates Foundation, conducted an operations research (OR) study to test both hypotheses. The Project worked to improve the quality of the 21-day training through the provision of a training coordinator for quality assurance and compared this to a four-phase **capsular training** model as an alternative SBA training approach. Capsular training was based on existing evidence showing that a phased capsular approach, which allows for a "spacing effect" (i.e., repeated training over spaced intervals), is more effective than the traditional single-bolus approach for competency-based training.[1,2,3]

Objectives

- Test the feasibility, effectiveness (as measured by improved knowledge and skills), and cost of a four-phase capsular SBA training compared with a single-bolus 21-day SBA training
- Develop recommendations for the GOUP to strengthen SBA training in the state

Capsular Training Approach

The SBA capsular training approach (Box 1) consisted of four clinical training capsules ranging from 4 to 7 days, delivered over a six-month period with a one-month gap between each session. Trainees returned to their work sites between capsules to practice skills learned. The capsular training design, by focusing on a specific set of skills in each capsule, allowed trainees to gradually learn and absorb the content over time. It also offered more scope for experience sharing, peer learning, and interaction with trainers due to relationships being formed over the six-month period. Finally, it allowed trainers to address trainees' questions or problems during subsequent training sessions.

The capsular training content, based on GOI guidelines[4], is identical to the 21-day training content. and used a Community Health Centre (CHC) as the training site. The four trainers included one Medical Officer trained in basic emergency obstetric and neonatal care and three Staff Nurses previously trained as SBAs and currently posted at the CHC. Each training batch included four participants.

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Box 1. Capsular SBA training content

Capsule 1: Basic skills (4 days)

- Antenatal care
- Infection prevention

Capsule 2: Essential skills (7 days)

- Conducting normal delivery
- Use of partograph
- Active management of third stage of labour
- Essential newborn care

Capsule 3: Initial complication management and referral (5 days)

- Newborn resuscitation
- Initial management of postpartum hemorrhage

Capsule 4: Initial complication management and referral (5 days)

- Initial management of severe pre-eclampsia and eclampsia
- Initial management of bleeding during pregnancy

Study Design

The Project used a matched-pair randomised design, with an experimental arm (capsular training) and a comparison arm (traditional 21-day GOI training). The study sample comprised 32 ANMs/LHVs/SNs posted in 22 rural government health facilities in Bahraich district that had no prior SBA training and worked in health facilities reporting more than 20 deliveries per month. The study matched trainees according to type of facility and number of deliveries conducted, prior to random allocation to either arm. Trainees included 25 ANMs, four LHVs, and three SNs. Trainees' average age was 48, and their average work experience was 22 years. They worked at Primary Health Centres (14 trainees), Additional Primary Health Centres (8), CHCs (7), or at the sub-centre level (3).

The Project standardised the following training aspects in both study arms:

- **Quality of Training:** The study appointed a full-time training coordinator to ensure rollout as per standard training guidelines. This included ensuring training site readiness, implementing the training schedule as planned, ensuring a mix of didactic teaching and hands-on practice, and maintaining trainee log sheets for practice of skills.
- **Trainers from the government health system:** Each arm used government staff as trainers. The training team at the district women's hospital, the site for the 21-day training, included two senior obstetricians and gynaecologists, one paediatrician, and a Staff Nurse. The training team at the CHC comprised of one Medical Officer and three Staff Nurses.
- **Comparable training procedures:** Both arms of the study used the same training batch sizes, curriculum, methodologies, training materials (e.g., mannequins, job aids), and GOI SBA certification criteria for determining provider competency.
- **Support and monitoring:** The Project staff participated in monthly meetings and used a monitoring checklist to ensure availability of SBA supplies at trainees' worksites.

Materials and Methods

The study assessed trainees' knowledge and clinical skills for delivery before and three months post-training through knowledge tests and clinical observations. For knowledge assessment, the Project used the GOI SBA trainee knowledge assessment guide. For clinical skills assessment, trained investigators carried out observations using a standardised checklist derived from the GOI SBA Handbook[5] for five priority skill areas: use of partograph, AMTSL, essential newborn care, newborn resuscitation, and infection prevention. Five trained General Nurse Midwives (GNMs) carried out all observations at the 22 trainee worksites. For each of the 32 trainees, investigators observed 5-8 deliveries for a total of 232 (119 experimental, 113 comparison) and 202 (102 experimental, 100 comparison) birth events at baseline and endline, respectively. Investigators collected baseline data from August to December 2012 and endline data from March to July 2013.

Results

SBA knowledge. Scores improved in both study arms (Table 1). Capsular training participants achieved higher scores for intranatal care (e.g., use of partograph, use of oxytocin for AMTSL) and management of obstetric complications than participants in the 21-day single-bolus training.

Table 1. SBA Pre and Post Test Knowledge Scores

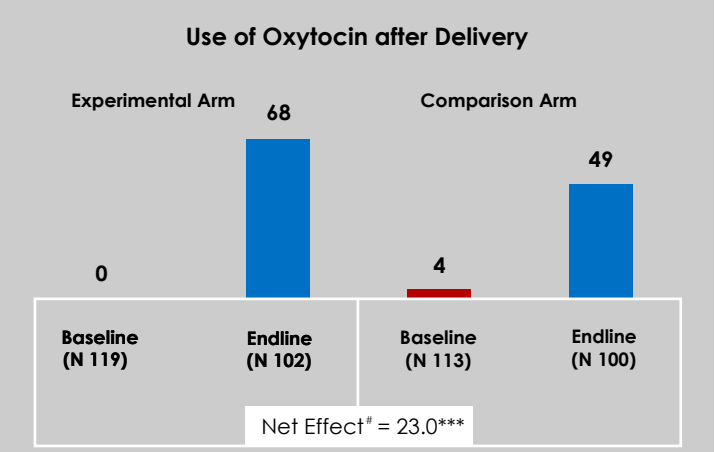
Test Score	Experimental		Comparison	
	Baseline	End line	Baseline	End line
70% and above	8	14	7	15
Below 70%	8	2	9	1
Number of trainees	16	16	16	16

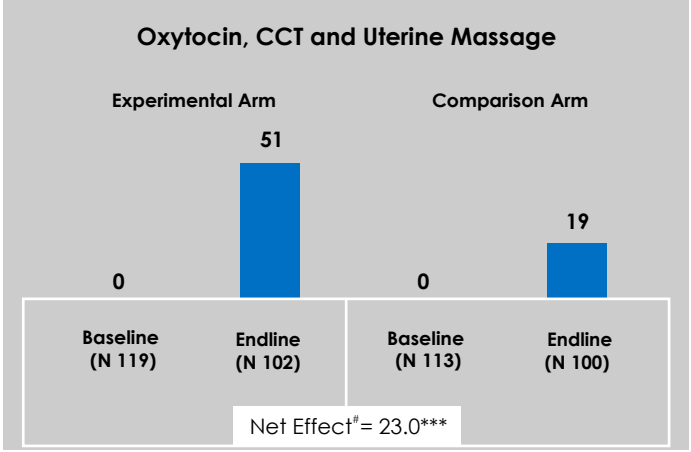
(All figures in numbers)

Partograph use. At baseline, none of the study participants used a partograph in any of the 232 deliveries observed, despite its availability at their worksites. At endline, while partograph use was still low, trainees in the experimental arm used it more (25%) than trainees in the comparison arm. Moreover, the quality of partograph plotting was comparatively better in the experimental than the comparison arm. More than half of deliveries in both arms arrived at the facility in an advanced stage of labour, which lessens the necessity of using a partograph.

AMTSL. At baseline, none of the trainees practiced AMTSL. At endline, the practice of AMTSL improved in both study arms (Figure 1). The experimental arm performed much better than the comparison arm for all the three AMTSL components, which includes administration of Oxytocin*, controlled cord traction (CCT), and uterine massage.

Figure 1. Practice of AMTSL





#Net effect= Difference of differences between baseline and endline in experimental and comparison arms in percentage
*p<0.05, **p<0.01, ***p<0.001 (All figures in percentage)

Intra-partum oxytocin use for labour augmentation. Although the SBA guidelines do not allow SBAs to use oxytocics for labour augmentation, this is a common malpractice[6]. After training, experimental arm trainees complied more with these guidelines, with only 14% providing labour augmentation at endline (down from 33% at baseline). Intra-partum oxytocin use continued in the comparison arm at about the same levels even after training (37% at baseline, 41% at endline).

* Oxytocin (10 IU, IM) is the recommended drug for prevention of PPH to be used during the third stage of labor.

Newborn care practices. For almost all the newborn care practices, participants from the experimental arm performed significantly better than their counterparts in the comparison arm after training (Table 2). Participants in the comparison arm performed relatively better for newborn weighing, which may be explained in part by the higher performance on this indicator among the experimental arm participants at baseline.

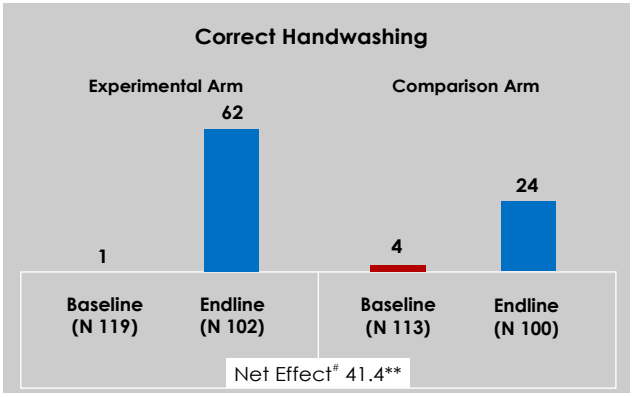
Table 2. Newborn care practices

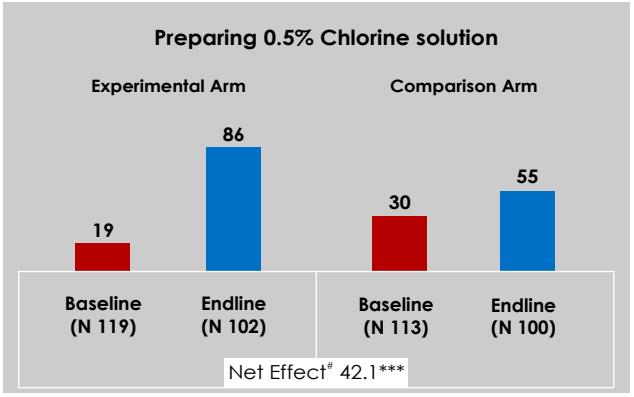
Newborn care practice	Experimental		Comparison		Net effect#
	Baseline	End line	Baseline	End line	
% newborn dried immediately after birth	67	94	64	70	22**
% newborn's temperature checked after birth	11	79	5	52	22**
% newborn wrapped and kept with mother	55	74	32	48	3
% newborn weighed	61	73	42	57	-3
% newborns intiated breastfeeding within an hour	61	68	53	38	22*
Number of observations	114	100	108	95	

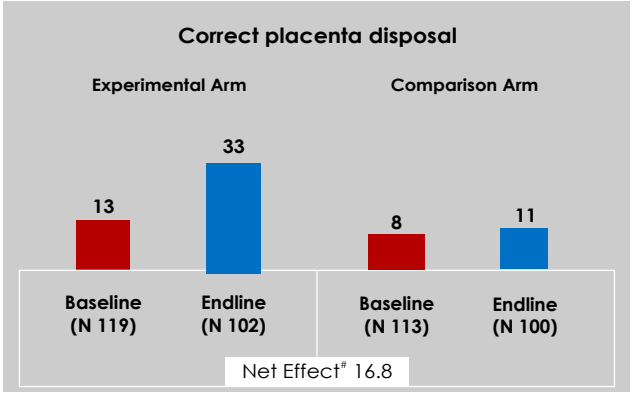
#Net effect = Difference of differences between experimental and comparison in percentage
*p<0.05, **p<0.01

Infection prevention. Infection prevention practices improved in both study arms. Participants in the experimental arm reported relatively more improvement, especially in hand washing practices and availability of 0.5 percent chlorine solution (Figure 2). The change in practice for correct disposal of placenta improved somewhat in the experimental arm but did not measurably improve in the comparison arm.

Figure 2. Infection prevention practices







"In the training I have learnt how to manage PPH and eclampsia cases….., I have also learnt how to fill a partograph and measure BP"

ANM, Bahraich

#Net effect = Difference of differences between baseline and endline in experimental and comparison arms in percentage; **p<0.01, ***p<0.001
(All figures in percentage)

Costing

The Project carried out cost analyses of the key activities associated with the two training approaches by enumerating the resources incurred for the SBA training, including the costs for the training coordinator and the costs of follow-up support for SBAs during monthly meetings. The training costs included the human resource cost of the trainers and trainees and the costs of venue, training materials, per diem, and related expenses. For human resource costs, the estimation process involved apportioning government officials and project staff time spent on implementing the training, and valuing this time based on a daily rate derived from their monthly salary. The costing study showed that the capsular training approach cost less than the traditional 21-day training (Table 3). The average cost per trainee in the experimental arm (Rs. 80,743) was 18 percent less than the comparison arm (Rs. 95,174). This is explained by the lower trainer costs in the experimental arm, which had more nurses than doctors.

Table 3. Comparative average costs for the two training approaches (INR)

Item	Experimental	Comparison
Training coordinator remuneration	25,000/month	25,000/month
Monthly facility visits to meet with SBAs[1]	2,528/site	2,528/site
Total training costs[2]	80,743/trainee	95,174/trainee
Total training cost for batch size of 4[3]	297,970/batch	355,694/batch

[1]Human resources and transportation.
[2]Includes training coordinator remuneration cost.
[3]Human resources, venue, training materials, per diem, and related expenses.

Lessons Learned and Recommendations

1. Emphasise quality for all training approaches.

Ensuring high-quality training leads to improved transfer of knowledge and clinical skills regardless of the training approach.

2. Capsular training approaches improve retention of knowledge and skills.

Capsular training participants performed better than trainees in the 21-day single-bolus training, suggesting that the capsular training approach is more effective. Incremental learning interspersed with short periods of practice at trainees' worksites improved competency at endline.

3. Trainings can occur in real health centre settings with trainees from the government system.

Health facilities with high delivery loads, such as CHCs, can serve as SBA training sites with some strengthening of training infrastructure. This can help fast-track training in districts. Properly trained Medical Officers and Staff Nurses at CHCs can serve as effective SBA trainers.

4. Dedicated training coordinators important to improve training quality.

The availability of a dedicated training coordinator ensured smooth coordination of training and oversight of all management aspects of training in both study arms. This addressed a persistent gap in the existing system,

which expects doctors and nursing staff to manage all aspects of training. The GOUP could appoint a consultant under the District Program Management Unit (DPMU) for this purpose.

5. Capsular training requires a tracking system.

The nature of capsular training required that a trainee tracking system be put in place to ensure trainees' participation in subsequent capsules. This could be managed by establishing a simple tracking system at the DPMU.

6. Capsular training is cost-effective. Capsular training approach costs are the same or less than the 21-day single-bolus training approach while producing better results.

Conclusion

The SBA capsular training approach offers a more effective approach compared with 21-day single-bolus training. Providers achieved improved knowledge and application of clinical skills in accordance with SBA guidelines when trained using the capsular approach, which does not cost more than the 21-day approach. In both approaches, it is important to appoint a dedicated coordinator and institute a trainee tracking system to ensure quality training management and implementation. Strengthening essential supplies and supportive supervision is critical for SBAs to practice and retain the newly acquired skills.

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The Purpose of the Manthan Project (2009-2013) is to support the Government of Uttar Pradesh to improve maternal and newborn health outcomes in the state through the development and adoption of effective operational strategies to increase coverage of evidence-based interventions within the National Rural Health Mission.

References

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The Manthan Project is led by IntraHealth International and funded by the Bill & Melinda Gates Foundation. For more information on the Manthan Project, visit www.intrahealth.org/manthan

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