DISSEMINATION BRIEF | JUNE 2021

An Innovative Approach to Strengthen Provider Capacity for the Prevention and Treatment of Postpartum Hemorrhage at Frontline Facilities

The 2019-21 Advancements in Postpartum Hemorrhage Care (APPHC) Partnership, led by Breakthrough RESEARCH and the Health Evaluation and Applied Research Development (HEARD) Project, conducted an implementation research study in Madagascar to test a package of interventions and tools designed to address key barriers for PPH prevention and treatment. Specifically, it aimed to address provider vulnerabilities and strengthen capacity and confidence through a novel approach for providers at primary health care centers/centre de santé de base (CSB) level.

KEY POINTS

- A facility-based mentoring program is an acceptable and a feasible strategy to improve provider knowledge and self-efficacy for delivering high-quality Post-Partum Hemorrhage Care.
- The Virtual Mentor – is a hands-free chatbot that speaks to health care workers and acts as the virtual voice of a senior clinical expert that is a realistic and acceptable option for training providers.
- Provider support tools to enhance the clinical environment for prevention, detection, and management of PPH are acceptable, appropriate, and feasible for use in frontline facilities.
- Realistic obstetric simulation training facilitated by mentors at frontline facilities in Madagascar is feasible and acceptable.

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Mentors visited CSBs and coached providers using two complementary capacity building components 1) they facilitated highly realistic postpartum hemorrhage (PPH) simulations enhanced with a Virtual Mentor (VM)—a hands-free chatbot that speaks to health care workers as they practice managing PPH, developed by researchers at the University of California San Francisco; and 2) they introduced a provider support package developed following formative research and tested by Ideas42 through Breakthrough RESEARCH.

Methods

The Intervention Package

The APPHC partnership worked closely with stakeholders from the MoH, the Society for Obstetricians and Gynecologists (COMAGO) and the Accessible Continuum of Care and Essential Services (ACCESS) project to design the intervention package. We implemented the provider support package and simulation and VM in 10 facilities in V7V. In an additional 10 CSBs in Atsinanana, we introduced VM with simulation alone due to resource constraints. Mentors introduced the intervention package at each CSB, across four visits.

Mentor Training

Master trainers led remote simulation training of mentors who received three days of training during which they learned to conduct each of the four PPH simulations and use the Virtual Mentor on Lenovo 7 tablet devices. They also received three remote coaching sessions with simulation and VM experts. ACCESS and MoH staff provided local training support.

In addition, pre-recorded instructional videos were developed and played during the mentor training sessions to remotely train mentors on each tool and included information on where and how to install and store these tools at CSBs. These instructional videos also ran through a visualization exercise on PPH risk.

In-situ Realistic Simulations with Virtual Mentor

Mentors made four visits, across a six-week time period, to all 20 CSBs in the study. During each visit (each of which lasted 1-3 hours), the mentor reviewed basic principles of PPH management prior to facilitating the PPH simulation, with help from a patient actor playing the role of the birthing woman. During the PPH simulation, the CSB provider conversed in French with Virtual Mentor, while assessing the patient and taking actions to stop excessive bleeding. The Virtual Mentor's algorithm aligns with Madagascar MOH standards. Virtual Mentor gives audible (in French), step-by-step recommendations for correct PPH management while the CSB provider practiced completing those actions, treating the actor as if she were a real patient. The PPH scenarios are summarized in Table 1.

TABLE 1 DESCRIPTION OF EACH SIMULATION CONDUCTED DURING EACH MENTOR VISIT

Visit #	Simulation description
1	Normal birth followed by a moderate PPH caused by uterine atony
2	Normal birth followed by a severe PPH caused by uterine atony, signs of shock
3	PPH diagnosed 30 minutes after birth caused by retained placental fragments, with shock
4	Precipitous birth followed by PPH caused by cervical laceration, with shock

Provider Support Tools

Breakthrough RESEARCH designed the four context-driven support tools together with CSB-providers informed by findings from earlier formative and baseline findings on PPH prevention, detection and management in V7V. The tools aim to enhance the clinical environment to support providers in the prevention, detection, and management of PPH and are further described in Table 2. The first three tools were designed for ongoing use during routine patient care once the mentor introduced them at the CSBs, and at some sites providers integrated these tools into the PPH simulations. Figure 1 summarizes the provider support package.

At the first visit to CSBs in the V7V region, mentors introduced the provider support tools, showed the training videos, and supported installation of the tools in appropriate locations at each of the ten participating CSBs.

Evaluation

We assessed the pre- and post-intervention PPH knowledge and self-efficacy of all providers and the acceptability, feasibility and accessibility of simulation and VM and provider

FIGURE 1 COMPONENTS OF THE PROVIDER SUPPORT PACKAGE

1. An activity to increase the perception of PPH risk and visualize the consequences

2. A timer that assists in the timely administration of oxytocin after delivery and other clinical tasks

3. A set of badges explaining the support roles that family members can play during deliveries, to facilitate task sharing with providers

4. A simplified, visual poster of the clinical algorithm on how to manage a PPH case, printed on phosphorescent paper

TABLE 2 DESCRIPTION OF PROVIDER SUPPORT PACKAGE INTRODUCED DURING 1ST VISIT AND REINFORCED IN SUBSEQUENT VISITS

Visit #	Simulation description
All	A glow-in-the-dark illustrated PPH algorithm poster
All	Task badges for delegating important support roles to family members during labor and delivery, and immediate postpartum
All	Custom-made timer to support consistent and timely administration of oxytocin immediately after birth
All	A risk and consequence visualization activity to motivate prevention and early detection of PPH

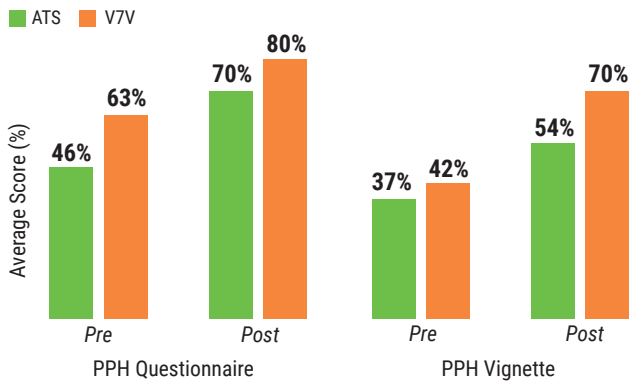
support tools at the final CSB visit. Mentors documented provider behaviors during PPH simulations. Observational data on the location and condition of the provider support tools in V7V region was collected during mentor visits. Providers were interviewed during the second and final visits and after the study ended. In addition, we sought input from the study participants and stakeholders throughout this implementation—during coaching sessions, debriefing workshops, and evaluation forms.

Results

This section highlights results from the PPH knowledge and efficacy assessment and provider interviews. Detailed analysis of all results is available upon request.

Thirty-one providers across 20 CSBs participated in this pilot study. The majority of participants were female (75%), younger than 40 years old (81%), midwives (55%), and reported less than five years of experience since qualification (52%). Participants in both regions demonstrated an increase in both PPH knowledge and confidence.

FIGURE 2 CHANGES IN PPH KNOWLEDGE AS ASSESSED BY PRE-POST PPH QUESTIONNAIRE AND PPH VIGNETTE RESPONSES



Knowledge Questionnaire

In the ATS region, scores on a 10-item knowledge test increased pre- to post- from 46% to 70%, and in V7V from 63% to 80%.

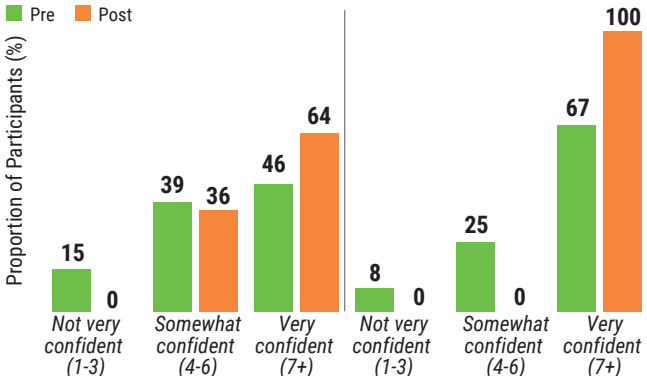
PPH Vignette: An Open-Ended Case Study Interview

A data collector read details of a PPH patient case to each provider and asked questions about what should be done to help the bleeding woman. We counted the number of correct PPH treatment actions the provider stated throughout this interview, out of 21 possible indicated actions. Providers, on average, increased their score in this assessment by 19 percentage points from pre- to post-intervention.

Pre- and Post- Self-Efficacy Questionnaire

We used the question, "How confident are you that you are able to effectively treat postpartum hemorrhage?" as a general measure of confidence, on a 1-10 scale. The proportion of participants that answered 7-10 (representing the highest confidence) increased between time points 1 and 2 in both regions—from 46% to 64% in ATS and from 67% to 100% in V7V (see Figure 3).

FIGURE 3 CHANGES IN SELF-EFFICACY MEASURES (BY REGION)



Provider Response to Intervention Components

We administered questionnaires and interviews to assess the acceptability, feasibility, and sustainability of the mentor's training approach. The following quotes are representative of these results. Similarly, providers from V7V CSBs consistently reported frequent use of and high satisfaction with the support tools during interviews. Specifically, they felt that the tools made their work easier and that they were more prepared to prevent and manage PPH.

Intervention Component	Illustrative provider quotes
Simulation	*"The simulation must be integrated in the CSB because women give birth in the CSB."* *"I would also like to be trained on...what is it again...how to use misoprostol, how to do cervical repair, how to use tranexamic acid, I need training specifically.... And also, a handover to us on bimanual compression, abdominal aorta compression, tamponade condom method. A refresher course."*
Virtual Mentor	*"The Virtual Mentor is very helpful because if I'm alone at the job and a PPH case comes up, the Virtual Mentor is like a colleague. He is the one who helps me."* *"[The provider was] very surprised and interested in the Virtual Mentor. All the tablets work well, except the utterances of the provider which disrupts the Virtual Mentor. After the simulation, the provider would like to obtain the Virtual Mentor as an aid or support device in the event that a PPH presents itself."* *"After the simulation, the service provider is very surprised, he accepts and fully agrees with the feasibility of the Virtual Mentor, he asks for an endowment of this device for the CSB because it facilitates and serves as a guide in the event that a PPH arises in the center."*
Timer	*"As soon as the baby is born, it keeps track of the time of that birth. Secondly, it helps to remember the oxytocin injection. It is because of these two things that I love it most. And that sets this timer apart."* *"The timer prevents problems. It's the absence of it that creates the problems because we'll be in trouble if we don't have the time."* *"Its existence reminds me that oxytocin needs to be prepared, that there is a fight against postpartum hemorrhage. Just seeing it reminds me of things."* *"It suits me because it helps me, and it makes my work during childbirth easier."*
Task Badges	*"The result of the badges in childbirth is that all the work is done on time. Everything is done on time. For example, if you ask for a service, it's done immediately. Everything is organized and there is no waiting for others. With the badge, everyone knows their role and they do it. In the days before badges, when you asked for something, everyone looked at each other."* *"Their help makes the work easier and lighter. It makes my job easier because they help me."* *"Whenever I see [the badges], I think that I am not alone. That there are people who can help me cope with a woman's birth."* *"Since the existence of the badges, everything has gone smoothly. I didn't get angry anymore. My relationship with the family of the parturient has improved a lot. Also, nothing disturbs me anymore. I am at peace."*
Algorithm Poster	*"I feel light when I see it, every time I see it because there is no more holding back or wondering what to do if there is a hemorrhage because it is already there."* *"When there is a case of PPH, it will be much easier to make the diagnosis to identify exactly what PPH it is since it is already noted in this poster, 'this and that can happen, so you have to do this and that.' In other words, you won't have a problem managing PPH during delivery since this poster exists because you can see immediately what you need to do."* *"To date, we haven't had a case yet. But anyway, every time we pass by it, we do a sort of retraining every time we pass by. Especially when it's at night, its light is a little bit special, it always catches your eye and you read it… It has become a lesson."*

Discussion

While the number of participants in this pilot study was small, results suggest a combined mentorship approach using virtual mentor and support tools is a promising package of tools to reinforce and improve knowledge, skills and confidence of providers. Mentor and provider participants consistently communicated that while Virtual Mentor is suitable for training and even real patient care, the application requires further improvement to be fully functional. Mentors also benefit from additional targeted simulation facilitator training. This package of approaches warrants further exploration in more facilities and with additional high-priority conditions such as preeclampsia. The provider support tool package was also welcomed by the providers, who reported during interviews they greatly appreciated the assistance of the tools and intend to continue their use during routine delivery care in their CSBs. There is potential for these support tools to be introduced in additional facilities to aid and reinforce consistent adherence to PPH care best practices.

Conclusion

This pilot study accomplished the overall objective of the APPHC collaboration, which was to identify barriers to optimal PPH prevention, detection, and treatment in Madagascar and to generate and test novel solutions that can change frontline providers' PPH-related behaviors. From project planning to implementation to evaluation, key collaborators and technical partners were fully engaged. The implementation data presented here suggests that the project was successfully executed and can be considered a potentially promising approach for replication in similar contexts. A more rigorous evaluation of impact on clinical outcomes is recommended.

Recommendations

- Expand in-person, simulation educator training for mentors focused on mastering simulation facilitation and debriefing.
- Improve Virtual Mentor's functionality including language recognition and clinical content.
- Integrate use of provider support tools more intentionally into simulation experiences for greater familiarity.
- Consider adding simulation training for other high-priority conditions such as pre-eclampsia, and procedures such as aortic compression and uterine balloon tamponade
- Consider adding team training to improve coordination of front-line emergency response.
- Consider a pilot study for use of the Virtual Mentor in actual patient care.

This work is part of the Advancing Postpartum Hemorrhage Care (APPHC) partnership supported by USAID and led by the Breakthrough RESEARCH Project and the Health Evaluation and Applied Research Development (HEARD) Project. The APPHC partnership generates and tests solutions to address key implementation barriers for PPH prevention and treatment and contributes to the effective implementation of interventions, strategies, and innovations for PPH in Madagascar and Malawi. https://www.respectfulcareresources.com/apphc

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