



## SPECIAL ARTICLE

## Application of evidence-based teaching in maternal and child health in remote Vietnam

Jane E. Hirst<sup>a,\*</sup>, Heather E. Jeffery<sup>b,c</sup>, Jonathan Morris<sup>a</sup>, Kirsty Foster<sup>d</sup>, Elizabeth J. Elliott<sup>e,f</sup><sup>a</sup> Royal North Shore Hospital, Sydney, Australia<sup>b</sup> School of Public Health, University of Sydney, Sydney, Australia<sup>c</sup> Royal Prince Alfred Hospital, Sydney, Australia<sup>d</sup> Northern Clinical School and Office of Postgraduate Medical Education, University of Sydney, Sydney, Australia<sup>e</sup> The Children's Hospital at Westmead, Westmead, Australia<sup>f</sup> Maternal and Child Health, Hoc Mai Australia Vietnam Foundation, University of Sydney, Australia

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## ABSTRACT

**Objective:** To develop, implement, and evaluate an evidence-based multidisciplinary teaching program to improve maternal and infant health in remote Vietnam. **Methods:** Needs assessments identified prevention of infection, neonatal resuscitation, and prevention of postpartum hemorrhage as primary targets. A 3-day workshop based on the small group, interactive, skills-based SCORPIO method was developed. Participants underwent formative written and performance-based assessments. Qualitative and quantitative evaluation of course content and teaching method was conducted. **Results:** Two annual workshops were conducted for 58 health professionals, all of whom demonstrated skills acquisition to an adequate standard on completion. The workshops were rated as good or excellent overall by 100% of the participants, who reported that the content would help with their clinical work and that the teaching method was acceptable and easy to understand. **Conclusion:** We demonstrated the SCORPIO method can be adapted to teach knowledge and clinical skills in remote Vietnam. Further work is needed to demonstrate an effect on health outcomes. © 2008 International Federation of Gynecology and Obstetrics. Published by Elsevier Ireland Ltd. All rights reserved.

## 1. Introduction

The remote and mountainous Dien Bien Province, approximately 500 km northwest of Hanoi, is one of the poorest regions of Vietnam. With a population of approximately 400 000, it is home to 21 different ethnic minority groups. Access to health services is influenced by the mountainous terrain, limited transport system, and the cultural reluctance of ethnic minority women to seek medical assistance. The estimated maternal mortality rate (MMR) is 400 per 100 000 live births and infant mortality is over 35 per 1000 births, which is higher than in Vietnam as a whole, where the estimated MMR is 100–130 per 100 000 live births and the infant mortality rate is 15 per 1000 live births [1–3]. The most common direct causes of maternal death in Vietnam are postpartum hemorrhage, pre-eclampsia, and infection [1]. The World Health Organization estimates that hemorrhage accounts for 25% of maternal deaths worldwide [4], while infection, asphyxia, and prematurity are the main causes of neonatal death worldwide [3].

Training of health professionals in Vietnam is largely based on didactic methods, with little opportunity for ongoing professional training. Small group, interactive teaching is more effective than didactic

methods alone in changing knowledge, skills, and clinical practice [5]. The SCORPIO (Structured, Clinical, Objective Referenced, Problem-oriented, Integrated, and Organized) teaching method developed by Hill [6,7] has been used effectively for both undergraduate and postgraduate perinatal teaching in low- and high-income healthcare settings [8–10]. In a World Bank funded project, SCORPIO was used to train health professionals working in 85% of birthing units in Macedonia. The method was highly valued by the majority and changed neonatal clinical practice, resulting in a 36% reduction in early neonatal mortality in babies weighing more than 1000 g [9].

With the support of the Vietnamese Ministry of Health and the Dien Bien Provincial Health Department, a group of health professionals from the Hoc Mai Foundation of the University of Sydney designed, delivered, and evaluated an evidence-based education program in Dien Bien province using the SCORPIO method. The objective was to improve knowledge and skills for providers of midwifery, obstetric, and neonatal services in Dien Bien Province and to assess the method's validity and acceptability in this setting.

## 2. Materials and methods

A multidisciplinary team visited a range of health facilities in Dien Bien Province to identify areas of educational need for health providers. Three priority areas were identified: neonatal resuscitation, prevention of anemia and postpartum hemorrhage, and prevention of maternal and neonatal infection. These field trips also provided the team with an

\* Corresponding author. Department of Obstetrics and Gynecology, Level 5 Douglas Building, Royal North Shore Hospital, St Leonards, NSW 2065, Australia. Tel.: +61 438025201. E-mail address: [janehirst@bigpond.com](mailto:janehirst@bigpond.com) (J.E. Hirst).

**Table 1**

Detailed teaching station learning objectives for SCORPIO: Prevention of maternal anemia and postpartum hemorrhage

Station	Learning objectives
Prenatal assessment of anemia	<ul style="list-style-type: none"> <li>• Define the term anemia</li> <li>• List the common causes of anemia in pregnancy in Vietnam</li> <li>• Describe the implications of anemia in pregnancy</li> <li>• Take a relevant history from a pregnant woman to establish possible causes of anemia</li> </ul>
Diagnosis of anemia	<ul style="list-style-type: none"> <li>• List the clinical signs of anemia in a pregnant woman</li> <li>• Employ universal precautions when taking a blood sample</li> <li>• Demonstrate the safe and correct method of obtaining a blood sample using a lancet</li> <li>• Measure and accurately interpret hemoglobin using the WHO color scale</li> <li>• Document the result of the test appropriately</li> <li>• Safely dispose of sharps and contaminated material</li> </ul>
Management of anemia	<ul style="list-style-type: none"> <li>• Outline prenatal management of the mild to moderately anemic pregnant patient</li> <li>• Differentiate between pregnant patients who require referral to a more specialized center for investigation and urgent management of their anemia and those who can be managed safely locally</li> <li>• Manage anemia safely with iron and folate as appropriate</li> <li>• Recommend appropriate intrapartum care for a pregnant woman who is diagnosed with anemia prenatally</li> </ul>
Management of the normal third stage of labor	<ul style="list-style-type: none"> <li>• List the clinical situations that involve high risk of postpartum hemorrhage</li> <li>• Recognize the signs of separation of the placenta</li> <li>• Apply controlled cord traction in a safe manner</li> <li>• Use oxytocin appropriately</li> <li>• Appropriately apply fundal massage</li> </ul>
Postpartum hemorrhage: assessment	<ul style="list-style-type: none"> <li>• Systematically describe the essential steps of assessment for a woman with postpartum hemorrhage</li> <li>• Assess blood loss reasonably accurately</li> <li>• Describe how to accurately assess the state of the fundus</li> <li>• Describe the conditions necessary to facilitate accurate and complete assessment of the lower genital tract for damage</li> </ul>
Postpartum hemorrhage: management	<ul style="list-style-type: none"> <li>• Outline principles of management of postpartum hemorrhage</li> <li>• Assess and appropriately replace fluid loss in a woman with PPH</li> <li>• Describe the appropriate drug therapy of PPH and administer drugs appropriately and safely</li> <li>• Apply continuous uterine massage and know when to stop</li> </ul>

appreciation of the remote and mountainous terrain, which impedes access to medical care, and insight into local cultural beliefs and low levels of education and literacy that influence delivery of health care to ethnic minority groups. The team met with key health professionals and leaders in the Provincial Health and Public Health Departments in Dien Bien Province as well as the Women's Union of Vietnam, the National Hospital of Paediatrics (which provides specialist pediatric services for North Vietnam), the Vietnamese Ministry of Health, the United Nations Population Fund, and WHO in Hanoi to discuss the content of the program and its feasibility and implementation.

A team of Australian health professionals comprising a pediatrician, 2 neonatologists, 2 obstetricians, 2 midwives, 2 neonatal nurses, a public health physician, and a qualified medical educator from a primary care background developed and implemented the program. Team members unfamiliar with the SCORPIO method of small group teaching were trained. As none of the workshop participants spoke English, 6 doctors from the National Paediatrics and Obstetrics Hospitals in Hanoi acted as interpreters for each workshop. The workshop began with the introduction of tutors and interpreters to the teaching method, setting the tone for a safe, interactive, and enjoyable learning environment.

The Dien Bien Ministry of Health selected participants for the workshops. The team encouraged selection of doctor–midwife pairs from individual health facilities. To date, 58 participants (at least 4 from all of the 9 districts in the province) attended a workshop in either March 2006 or November 2007.

A 3-day workshop was designed for 30 doctors, midwives, and nurses. Each day was devoted to 1 of 3 topics: prevention of infection; neonatal resuscitation; and prevention of maternal anemia and postpartum hemorrhage. Course content was evidence based and referenced appropriately [11–17]. Teaching materials were translated into Vietnamese. All materials and equipment, including pelvic models and infant mannequins to teach obstetric and resuscitation techniques were brought from Australia. Some items of medical equipment that were used in the workshop but were not available in Dien Bien Province (eg, neonatal resuscitaire, neonatal laryngoscope, infant bag-and-mask set, WHO anemia test kit) were transferred to health directors at the conclusion of the workshop.

Prior to the workshop, all participants were given specific written learning objectives and reference material in both Vietnamese and English (Tables 1 and 2). One SCORPIO was run each day, beginning with an introductory lecture or practical demonstration for the whole group. Following this, the participants were divided into 5 groups of 6 and rotated through 6 teaching stations each lasting 25 minutes and with a 20-minute break after 3 stations (Fig. 1). Each station had well-defined learning objectives (Table 1). Stations were highly interactive and used adult teaching and learning concepts such as problem-based techniques and role play for clinical reasoning, and “tell-show-do-feedback” to enable acquisition of skills. At the end of each SCORPIO a formative assessment was conducted using an individual or group OSCE (Objective Structured Clinical Examination) and a short written test. Immediate feedback was provided and retraining given as required.

A predetermined level of competency had to be achieved for successful completion of the program. Participants who were identified to need remedial help were given individual teaching and the opportunity to practice relevant skills before being reassessed.

Evaluation of the individual SCORPIOs and of the workshop overall were conducted using anonymous questionnaires completed by participants. We used 5-point Likert scales to assess the attributes of the teaching program, where 1 represented “poor” or “strongly disagree” and 5 represented “excellent” or “strongly agree.” Participants were also given the opportunity to provide comments on how the workshop could be improved. Formal evaluation was also sought from interpreters and tutors and debriefing discussions were held at the end of each day.

### 3. Results

A total of 58 participants attended 2 workshops conducted at the Dien Bien Provincial Hospital in 2006 and 2007. By the end of the

**Table 2**

Topics for SCORPIO stations and formative assessment: Prevention of infection and neonatal resuscitation

Prevention of infection	
Station topics	<ul style="list-style-type: none"> <li>• Prevention of postpartum maternal infection</li> <li>• Neonatal infection</li> <li>• Neonatal skin, eye, and cord care</li> <li>• Maintaining a clean area for delivery</li> <li>• Effective handwashing</li> </ul>
Formative assessment	<ul style="list-style-type: none"> <li>• Individual OSCE: management of a sticky eye in the newborn</li> <li>• Short written test</li> </ul>
Neonatal resuscitation	
Station topics	<ul style="list-style-type: none"> <li>• Preparing for resuscitation</li> <li>• Assessment of the newborn infant</li> <li>• Bag and mask ventilation</li> <li>• Intubation</li> <li>• Integrated resuscitation</li> <li>• Post resuscitation care</li> </ul>
Formative assessment	<ul style="list-style-type: none"> <li>• Individual OSCE: bag and mask ventilation</li> <li>• Short written test</li> </ul>

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