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Averting maternal death and disability

The evolution of a quality of care approach for improving emergency obstetric care in rural hospitals in Nepal

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Abstract

We describe the iterative process of developing a locally-appropriate quality of care approach and its role in emergency obstetric care (EmOC) programming in Nepal. We describe the context of maternal health issues in Nepal, the rationale for developing a quality of care approach within a model to improve EmOC, and outline the outcomes and catalytic effects of the process. The lessons learned during the development of this approach are detailed. The program developed and implemented a quality of care approach at three district hospitals in Nepal. This resulted in improvements in the structure, process and outcomes of EmOC in these institutions. The process also resulted in improved understanding of quality of care approaches on both local and national levels and the creation of a Nepalese quality of care evaluation framework for maternity services. While the theoretical concept of quality of care is difficult to translate into a concrete approach, we used a process in rural hospitals in Nepal that created highly motivated teams and improved the overall functioning of these hospitals.

Keywords: Quality of care; Safe motherhood; Emergency obstetric care; Developing countries

1. Introduction

Improving the quality of care (QOC) within maternal health is an area that has gained significant interest in recent years. However, it remains a subject of debate with a range of opinions on the definition of quality of care and the extent to which QOC determines utilization levels. Furthermore, there exists more literature on models and approaches than on actual implementation experience.

We describe a QOC approach integrated into the efforts of His Majesty's Government of Nepal (HMGN) and the Nepal Safer Motherhood Project (NSMP) to improve access to and the quality of

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emergency obstetric care (EmOC) in rural districts. The Nepal District EmOC Model, the rationale for a QOC approach within that model and the process of developing a QOC approach over a 5-year period (1997–2003) are presented.

When NSMP first began to explore the use of a QOC approach, most documentation concerning implementation pertained to the field of family planning [1]. The evolution of NSMP's quality of care approach occurred in parallel with the development of the international application of QOC to maternal health and has drawn upon the literature as it has been presented.

As there remains a paucity of documentation about the use of QOC approaches in improving maternity care [2], Nepal's experience is relevant to other low resource countries challenged with reducing unacceptably high maternal mortality rates.

2. Nepal context

2.1. Maternal health and health services

Nepal is a small landlocked country of 23 million people [3], 71% of whom live below the poverty line [4]. Significant progress has recently been made in some areas of reproductive health with current total fertility rates of 4.1 and a contraceptive prevalence rate of 39% [5]. Nepal's maternal mortality ratio (MMR) remains high. While the government claims an MMR of 539 deaths per 100 000 live births [6], UN estimates put it at 740 (range 440–1100) [7]. It is estimated that 12 women die each day in Nepal due to pregnancy, labor and postnatal complications. Almost half of these deaths are attributable to postpartum hemorrhage [8] and most are avoidable. Only 12% of births are attended by a skilled provider, a doctor or nurse, and over 90% of births take place in the home [5]. Only 5% of the estimated need for EmOC is currently met. Indeed, only 0.7% of all births (estimated using crude birth rate and population) are by cesarean section—compared with the UN target rate of 5–15% [4]

Nepal's health policy reflects a commitment to safe motherhood; however, this has yet to be translated into an adequate allocation of funds—a situation common in many low-resource countries. While the cost of an emergency safe motherhood/child survival package in Nepal is estimated to cost US$4.73 per capita, at present only US$3.1 per capita is spent on all health care [9].

Nepal's doctor-to-population ratio is four per 100 000 (compared with the UK's ratio of 164 per 100 000) [10], and most doctors, including 60% of obstetricians, are in urban areas. Thus services are even scarcer for the 85% of the population who live in rural areas. Health care services for the majority of Nepal's population are provided by a complex network of rural healthcare providers—both allopathic and ayuravedic—with varying level of skills. Policy makers face the dual challenges of trying to better allocate available resources as well as to increase resource levels.

2.2. The national safe motherhood policy and program

Only within the last decade has HMGN begun to address maternal health as a serious health issue. Concerted efforts to reduce maternal mortality commenced in 1997 with the launch of the HMGN Safe Motherhood Program. This was followed a year later with the National Safe Motherhood Policy, a far-reaching, comprehensive policy that addresses both health service needs (excluding post-abortion care) and the social barriers to achieving safe motherhood goals. HMGN has recognized that maternal mortality cannot be significantly reduced without access to lifesaving services [11]. Efforts to increase access to quality comprehensive and basic emergency obstetric care (CEmOC and BEmOC) are now central to the national program's strategy.

To increase access to EmOC services, HMGN has focussed on expanding the role of nurses, recognizing this as a key factor in scaling up EmOC services. HMGN has defined clinical protocols for health workers, developed and implemented midwifery courses, enabled nurses to provide postabortion care (PAC) and endorsed an anesthetic course for nurses which will allow them to expand the spectrum of BEmOC services they can provide. The recent (2002) passage of a bill

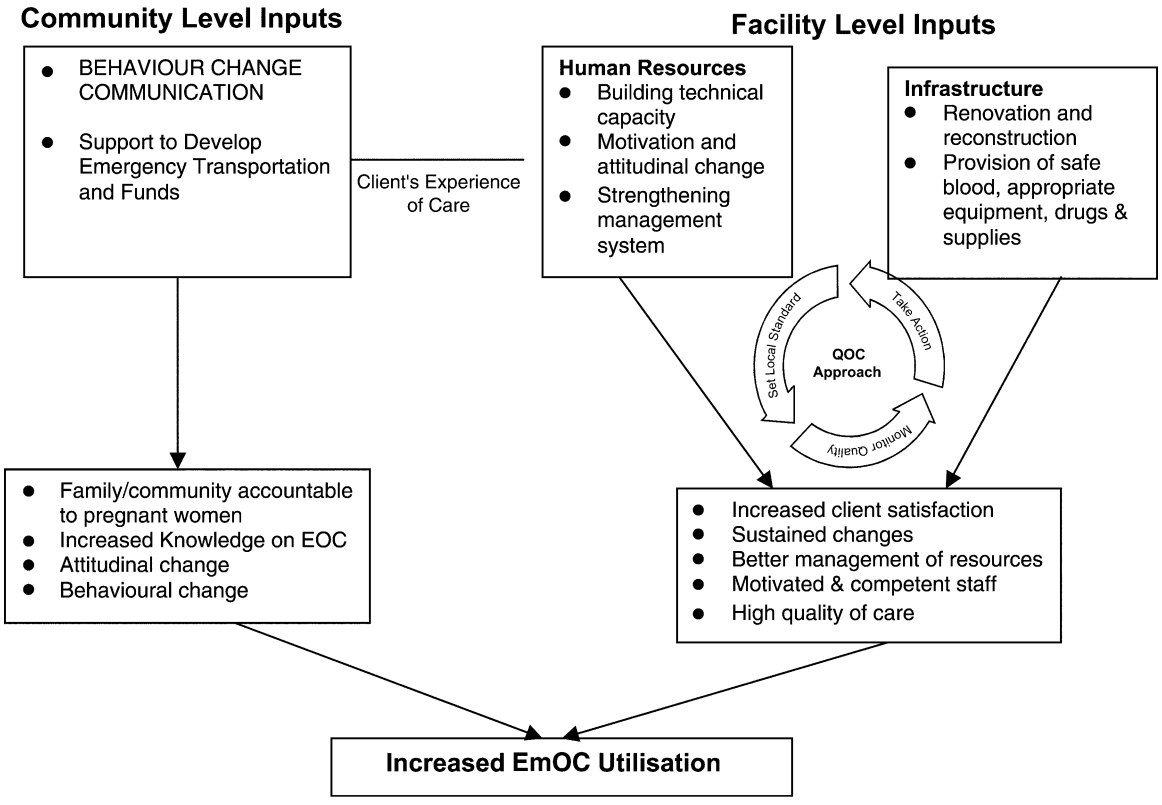

Fig. 1. Nepal district model to improve EmOC.

legalizing abortion under certain circumstances was accompanied by a training strategy that includes nurses as comprehensive abortion care providers for early gestations. A national assessment of the performance of HMGN's lowest cadre of health care providers, Maternal Child Health Workers (MCHW) has just been completed with resulting policy implications [12]

HMGN has recently begun EmOC monitoring (to be fully integrated into the national health information management system). Coupled with these efforts to provide more—and better—maternal care, HMGN has greatly improved its understanding of strategies to address the complex barriers to care including the development of a behavior change communication strategy.

2.3. The Nepal safer motherhood project

In 1997, the Nepal Safer Motherhood Project (NSMP), funded by DFID and managed by Options UK, began with the explicit purpose of promoting utilization of EmOC through the development of a District EmOC Model to address the availability and quality of care, and barriers to EmOC-seeking behavior in project communities. Within its supported districts, the project aims to increase utilization of quality midwifery and basic and comprehensive EmOC services. To do this, NSMP works to improve service provision (facility level), demand creation (community level), and national policy (central government).

Fig. 1 shows the Nepal District Model to Improve EmOC. At the level of the hospital and health care facility, both 'software' and 'hardware' components were provided. Software support included a range of training for clinical and non-clinical staff, e.g. training on infection prevention, emergency newborn care, post-basic midwifery and midwifery refresher, use and maintenance of equipment, and anesthetic assistance. Hardware

support has ensured adequate infrastructure for full EmOC, e.g. construction and renovation of operating theaters, labor wards, and maternity wards; adequate hospital equipment and supplies; and facilities for a 24 h blood transfusion service. At the community level, we addressed client needs and satisfaction through behavior change communication strategies and addressed such practical needs as emergency funds and transport schemes (these are managed through over 50 partner organizations).

During Phase One of the project (1997–2000), NSMP operated in three districts expanding to a total of 10 districts in Phase Two (2001–2004), representing 15% of Nepal's population. The total NSMP direct support budget for both phases is £2.08 million sterling, or US $3.7 million.

3. Quality of care approach

The underlying principle of NSMP's QOC approach is that improved QOC contributes to enhanced patient care and improved maternal outcomes. The positive relationship between QOC and service utilization has been proven for family planning [13] and evidence that sub-standard obstetric care contributes to maternal mortality [14] also underlies the QOC approach.

NSMP recognized that supporting staff training and upgrading facilities would not automatically lead to improved EmOC. Project staff also appreciated that many clinical workers lacked motivation for many reasons and that there was an 'implicit' health system culture in Nepal that viewed the health system as the means of providing income to health care workers rather than health care to patients [15]. The QOC approach explored the mindset of providers and encouraged them to participate in finding ways to overcome barriers to good quality service. The 3 general steps in the approach are to (1) set local standards for quality of EMOC services; (2) take actions to achieve the agreed-upon standards and (3) monitor changes over time.

3.1. Development of the QOC process—1997–2000 (Phase 1)

The first step in the development of a QOC approach was a baseline assessment using tools modified from WHO's Mother–Baby Package [16]. These tools (Table 1) were used in 1997 to assess the 3 hospitals supported in Phase One and, slightly revised in 2000, to assess the seven Phase Two hospitals and five Primary Health Care Centres (PHCCs). The original QOC monitoring tools comprised of a set of yes/no checklists, reviewing 10 elements that covered resources available, practices to ensure effective use of resources, mortality and morbidity outcomes and availability of EmOC services.

Next, two teams were created at each district hospital, one each for maternity care and infection prevention—and collectively called the QOC team. The maternity team consisted of the nursing staff, a doctor, and support staff. The infection prevention team consisted of a medical superintendent, the charge nurse, the head of central supply, an administrator, support staff, cleaners and a representative for each hospital unit. These QOC teams were facilitated by hospital-based and project-supported Human Resources Development Officers (HRDOs) (experienced midwives with an understanding of safe motherhood principles). We also provided technical training, received by members of both teams, to determine and set their own standards for maternal healthcare and infection prevention practices.

Arriving at the ideal definition of what constitutes QOC at the three district hospitals proved difficult as there was no internationally accepted definition at that time despite two decades of addressing QOC [1]. Despite the lack of consensus, there was general agreement that the QOC concept must move from a focus on biomedical outcomes to a more inclusive definition that addresses both provider and client satisfaction [17]. The flexibility of NSMP's approach meant that each hospital group could choose its own definition of 'Quality of Care'.

Both the maternity and infection prevention teams assessed each hospital's QOC monthly (using the 1997 checklists). They identified barriers to quality healthcare and analyzed causes of poor care. They developed local action plans (copies of plans were posted in the maternity unit to encourage all staff members to participate in the

Table 1
Quality of essential obstetric care monitoring tools—1997

Element 1. Accessibility and availability of services			
	Indicator: BEOC facility is providing the following services 24 h a day		
Q1.1.0	Injectable oxytocic	Y	N
Q1.1.1	Injectable antibiotics	Y	N
Q1.1.2	Injectable sedatives and anticonvulsants	Y	N
Q1.1.3	Injectable antihypertensives	Y	N
Q1.1.4	Plasma expanders	Y	N
Q1.1.5	Instrumental delivery (forceps or vacuum)	Y	N
Q1.1.6	Manual removal of placenta	Y	N
Q1.1.7	D and C	Y	N
Q1.1.8	MVA and postabortion care	Y	N
Q1.2	*Indicator: CEOC facility is providing the following services 24/7*		
Q1.2.1	All of the above (BemOC)	Y	N
Q1.2.2	Cesarean section	Y	N
Q1.2.3	Laparotomy	Y	N
Q1.2.4	Blood transfusion	Y	N
Element 2. Safe blood transfusion services			
	Indicator: the blood transfusion facility has the following		
Q2.2.1	All types of donors are available	Y	N
Q2.2.2	A skilled technician available 24/7	Y	N
Q2.2.3	Screening tests are always available	Y	N
Q2.2.4	There is a provision free blood if unable to pay	Y	N
Element 3. Availability of essential supplies and equipment			
	Indicator: The following provisions are always available		
Q3.1.1	Running water in the delivery room	Y	N
Q3.1.2	Running water in the operating room (OR)	Y	N
Q3.1.3	OR with clean and dirty layout	Y	N
Q3.1.4	Screens in delivery room	Y	N
Q3.1.5	Functioning OR light	Y	N
Q3.1.6	Functioning light in delivery room	Y	N
Q3.2	*Indicator: the following equipment are always available*		
Q3.2.1	Functioning sterilizer for equipment and supplies	Y	N
Q3.2.2	Functioning vacuum extractor	Y	N
Q3.2.3	Functioning suction in OR	Y	N
Q3.2.4	Functioning suction in delivery	Y	N
Q3.2.5	Sterile pack for normal delivery		N
Q3.2.6	Sterile pack for cesarean delivery	Y	N
Element 4. Promotion and protection of health			
Q4.1	*Indicator: all pregnant women attending ANC and before discharge are always alerted to the warning signs of obstetric emergencies:*		
Q4.1.1	Verbally during antenatal care	Y	N
Q4.1.2	Verbally during the postpartum before discharge	Y	N
Q4.2	*Indicator: IEC materials on warning signs are always used to reinforce safe motherhood messages*		
Q4.2.1	Available	Y	N
Q4.2.2	Used	Y	N
Element 5. Acceptability of services			
Q5	*Indicator: The following provisions are made to improve the acceptability of services to women and their families*		
Q5.1	Screens are used to ensure privacy during labor and physical examination	Y	N
Q5.2	A companion allowed with client in 1st stage labor	Y	N

Q5.3	A female companion allowed with client in 2nd and 3rd stages of labor	Y	N
Q5.4	A female attendant tends to woman during delivery	Y	N
Element 6. Technical competence of health care providers			
Q6.1	*Indicator: protocols or guidelines available and used for the following care*		
Q6.1.1	Normal care during labor	Y	N
Q6.1.2	Care of normal neonate (immediately postpartum)	Y	N
Q6.1.3	Care of the woman with pre-eclampsia	Y	N
Q6.1.4	Care of the woman with obstructed labor	Y	N
Q6.1.5	Care of the woman with incomplete abortion	Y	N
Q6.1.6	Care of the woman with puerperal sepsis	Y	N
Q6.1.7	Care of the woman with PPH	Y	N
Q6.1.8	Infection control procedure	Y	N
Q6.1.9	Waste disposal	Y	N
Q6.1.10	Referral to another center	Y	N
Q6.1.11	Postpartum care of mother and baby	Y	N
Element 7. Client-provider interaction			
Q7	*Indicator: evidence of:*		
Q7.1	Procedures are explained to women and families	Y	N
Q7.2	Verbal consent for procedures is obtained	Y	N
Q7.3	Clients are actively involved in conversations about care (e.g. they ask questions, give opinions, staff check for understanding)	Y	N
Element 8. Comprehensiveness of care and linkages to other reproductive health services			
Q8	*Indicator: the MCH clinic offers a comprehensive reproductive health services 5 days a week. This should include:*		
Q8.1	Antenatal care	Y	N
Q8.2	Tetanus toxoid immunization	Y	N
Q8.3	STD diagnosis and treatment	Y	N
Q8.4	Postnatal clinic	Y	N
Q8.4	Depo-Provera	Y	N
Q8.5	Oral contraceptives	Y	N
Q8.6	Norplant	Y	N
Q8.7	Intratterine devices	Y	N
Q8.8	Condoms	Y	N
Q8.9	Female sterilization	Y	N
Q8.10	Male sterilization	Y	N
Element 9. Continuity of care and follow up			
Q9.1	*Indicator: protocols and guidelines for referral to follow up services are available for:*		
Q9.1.1	Postnatal referral for family planning	Y	N
Q9.1.2	Postnatal referral for childhood immunization	Y	N
Q9.1.3	Referral to next referral center emergencies that cannot be handled at the hospital	Y	N
Q9.1.4	Feedback to peripheral staff who have referred a woman for EOC to the hospital	Y	N
Element 10. Support to health care workers			
Q10.1	*Indicator: all the following sanctioned posts are always filled to ensure 24 h a day services*		
	Grade of staff	Always Sometimes Rarely Never	
Q10.1.1	Medical superintendent or DHO as appropriate		
Q10.1.2	Public health officer		
Q10.1.3	Medical officer anesthetist		
Q10.1.4	Matron		
Q10.1.5	Sister in charge		

Q10.1.6	Staff nurse
Q10.1.7	Auxiliary nurse midwife
Q10.1.8	Auxiliary health worker
Q10.1.9	Health assistant
Q10.1.10	Peons
Q10.1.11	Sweepers
Q10.1.12	Administrative staff

assessment process). And they worked to implement the plans over the following month. Both teams reviewed the previous 3 months' action plans each quarter. Areas of improvement were noted and, in cases where activities had stalled, incomplete actions were followed up over to the next period. Findings were recorded, with one copy sent to the project office in Kathmandu and one copy retained at the hospital.

Six months after this process began (in September 1999), all hospital staff met to assess and review progress. This meeting incorporated feedback from hospital clients on QOC and enabled the entire hospital staff to better understand the QOC approach and evaluate the overall quality of maternal healthcare: identifying their own problems, learning about possible solutions from each other and sharing assessment findings in a non-threatening environment. The meeting also allowed the QOC teams to share with other staff progress made towards improving the quality of care in their units, to assess how other basic health services were affecting that quality (laboratory, drug management, and emergency services etc) and to develop solutions. Several problems were addressed using only local funds or incurred no cost, e.g. hospital management committee recruitment of local nurses to fill vacant posts, modifying clinic hours better to meet the needs of clients, supporting the cost for the additional drugs and supplies, and maintenance and repair. However, NSMP provided most of the resources to deal with infrastructure and supply needs during the first 2–3 years.

Integral to this process was the adoption of methods to encourage accountability, respect and desire to provide service amongst staff members that will result in both a greater self respect and a respect for clients, and help staff internalize the concept of responsible care giving.

Approaches adopted were:

- integration of an appreciative approach to all interactions—seeking strengths and achievements in work and building on these rather than focusing on problems;
- involving everyone as equals, for example in staff meetings and planning processes, thereby challenging inherent caste and gender barriers to team work;
- engendering a belief that staff themselves are able to develop their own potential and to challenge inherent limitations of caste and sex.

3.2. Development of the QOC process—2001–2003 (Phase 2)

At the end of the first phase of NSMP, three events accelerated the evolution of the QOC process just as the project was preparing to scale up from three districts to 10. First, the Infection Prevention and Maternity Care teams in each hospital decided to merge into one general QOC team; second, local ownership of the process dramatically increased as hospital management committees assumed full responsibility for providing emergency supplies and services previously given by NSMP, and the team leadership shifted from the project-supported HRDO to one of the hospital nurses identified as a 'change agent'; and third, several key pieces of international research in QOC were published that helped in defining QOC, and addressed the monitoring of progress in the context of maternity services [18–20].

From the beginning, the Family Health Division (FHD) of HMGN's Department of Health Services (DOHS) closely observed the progress and experience of NSMP's District EmOC model and QOC approach. In 2001, the FHD and NSMP held a joint review of 5 years' experience of this approach, incorporating the new evidence-based international learning. The approach was revised,

and was published as the Nepali language 'Guide for Quality Obstetric Care' (March 2002). The tools, including locally appropriate tools for monitoring the quality of EmOC, were jointly developed with HMGN and received consensus approval from other agencies managing projects in safe motherhood (UNFPA, UNICEF, GTZ and USAID). In addition, this process resulted in the agreement and provision of one definition of QOC—that proposed by Pitroff and Campbell [18].

> High quality of care maternity services involve: (i) providing a minimum level of care to all pregnant women and their newborn babies and (ii) a higher level of care to those who need it; (iii) obtaining the best possible medical outcome; (iv) providing care that satisfies women and their families and care-providers and (v) maintaining sound managerial and financial performance and developing existing services in order to raise the standards of care provided to all women.

The jointly revised QOC model emphasised the importance of monitoring the process in QOC improvement and provided additional user-friendly monitoring tools in Nepali. The original checklists were modified to include guidelines on how to monitor the process of change over time. This model adopted Graham's [20] criteria-based audit processes into the QOC approach. These criteria assist staff to quantify the technical performance of care in each facility with individual facilities choosing two or three technical practices to audit over a 6 month period—for example rates of induction, episiotomy and post-operative infection.

The 'Guide for Quality Obstetric Care'[1] is now used in two zonal hospitals, nine district hospitals, and four primary health care centers. The guide also provides information on quality of care and a set of tools for measuring progress in improving QOC in both the provision of care (Table 1) and in clients' experience of the care provided.[2] These tools are used at minimum for quarterly review and feed into the development of action plans, copies of which are forwarded to FHD and NSMP.

[1] Available from the Family Health Division, Ministry of Health, His Majesty's Government of Nepal, Kathmandu, Nepal.

[2] Available from the Safer Motherhood Project, or the corresponding author.

4. Results

NSMP has adopted Donabedian's framework [21] to assess progress under the headings of structure, process and outcome. Considerable evidence for positive changes in the quality of EmOC at supported facilities has come from the self-assessment workshops held in the autumn of 1999 and an independent review of NSMP in June 2000. In addition, NSMP has received anecdotal evidence of the impact of the QOC approach since 2000.

4.1. Structure—resources, equipment and care providers

4.1.1. Availability of all necessary infection prevention materials

In 1997, of the eight emergency materials (virex, utility gloves, puncture proof containers, apron, towels, boots, soap and running water) needed for infection prevention only two (running water and soap) were available in all three NSMP-supported hospitals—and then only periodically. The project provided the required materials for 2 years until hospital staffs were able to lobby hospital management committees to provide the resources to sustain these supplies, achieved in 2001. Eighteen months into Phase Two, seven additional project-supported district hospitals have also become self-sustaining in the area of infection prevention materials.

4.1.2. Provision of 24 h blood supply service

None of the NSMP-supported hospitals had a 24 h blood transfusion service in place in 1997 but by the end of the second year of project support, all did. The total number of units of blood supplied per facility in 2001 ranged from 279 to 984 units with about half being for obstetric emergencies. No hospital exempted poor women from paying for this service but by the end of year three all provided some blood free (though only 7–9% of the total) to very poor women in need of transfusion [22].

4.1.3. Provision of drugs obstetric emergencies

Initially, none of the hospitals had on-site supplies of magnesium sulfate or oxytocics. The

project supported the supply of these at first and within 2 years the hospital management committees valued these drugs sufficiently that they are now continuously available.

4.1.4. Availability of nurses

The chronic under-filling of sanctioned posts coupled with a high transfer rate results in a constant state of understaffing. Before 1997, only 30% of government sanctioned posts were filled at the three district hospitals, by 2002 this proportion had risen to 50% and, by 2003, 90–100% of these posts were filled. This dramatic improvement was due in part to active recruitment by the hospital management committee, using funds generated locally through user fees and income from the rental of small shops in the hospital compound. The budget to cover salaries for sanctioned posts had previously been budgeted (but not spent) by HMGN Ministry of Health, therefore no new funds were required. However, even when all sanctioned posts were filled, there were still too few nurses to meet hospital needs. Hospital management committees responded by hiring more local nurses (who were outside the government system and therefore, not transferable) to boost the number of nurses by an additional 20–50%. While these local nurses are not government workers and receive no long-term government benefits, they benefit professionally from project-sponsored in-service training. Lower level nurses (assistant nurse midwives) also have the opportunity to receive formal nursing training to advance up the career ladder if their performance is exceptional.

4.1.5. Availability of midwifery and EmOC services

In 1997, none of the nurses at the three district hospitals had received any training, beyond the basic course, on critical areas of EmOC. By 2003, over three-quarters had received midwifery training and approximately one-fifth was trained as post-abortion care (PAC) providers.

4.1.6. Improved training approach

The project's original needs assessment surmised that training individuals had not been effective in motivating staff to improve the quality of care; staff expressed their view that individual training created jealousy and a high level of resistance to any new ideas newly trained colleagues tried to introduce.

Therefore, NSMP adopted a 'whole site training approach' with training provided to support staff, the administrative team, and hospital management committees all at the same time. One advantage of this approach is that at the end of the training every member has the same level of involvement and knowledge creating a sense of responsibility and support. Another is that the training takes place in the workplace saving travel time and money and allowing staff to continue with some of their regular responsibilities while the training is in progress. Subject matters covered in the 'whole site approach' included infection prevention, communication skills, and management.

4.2. Process–the way in which health care is delivered

4.2.1. Integration of reproductive health services

Before 1997, antenatal care (ANC) and antenatal tetanus toxoid (TT) immunizations were provided separately and only in one clinic per week. ANC services were restricted from 10:00 h to 14:00 h. Outpatient department and reproductive health services such as postnatal care, family planning (FP), and STD/RTI all functioned separately; with family planning services often not provided on the same days as other reproductive health clinic services.

Currently, most hospitals have integrated ANC, TT and PAC with other maternity and FP services, and the numbers of ANC clinics per week have increased. There is now a referral link between the ANC clinic and the general medicine clinic to manage STD/RTI cases.

4.2.2. Client–provider interaction

The 1997 needs assessment showed that hospital staff blamed their poor interpersonal communication skills on the time constraints of high patient loads. An example of how this was addressed came from the finding that ANC clinics opened very late (approx. 23:30 h), creating overcrowding and a long waiting time for pregnant women. To staff it appeared as though there was little time or

space to respond to women's concerns or explain procedures to them. In 1998, a whole site workshop on 'interpersonal communication skills' gave staff both the opportunity to learn how to use time more effectively, and to learn and practice new counselling skills. Changes occurred: the ANC clinic opened at 22:00 h, verbal consent for obstetric procedures was obtained, women's concerns and questions were addressed, and women were supported to make decisions based on factual information.

4.2.3. Continuous monitoring of quality improvement

The joint development and adoption of the Nepali language 'Guide for Quality Obstetric Care' and its regular use by 17 institutions across the country showed increased awareness of, and interest in, improving the quality of obstetric care. In 2003, NSMP brought all local 'change agents' together to review their experiences with the guide; this resulted in changes in the monitoring tools in plans for a more strategic review of the manual to be followed by translation into English.

4.3. Outcome

To evaluate outcomes we used process data (e.g. EmOC utilization data) which are usually more sensitive than outcome data to changes in quality. Outcomes (such as number of deaths) may also be affected by non-facility QOC factors [17].

4.3.1. Addressing sustainability

Local ownership of the QOC approach is now evident in the ability of the hospital staff to maintain QOC improvements in the face of the gradual and planned reduction in on-site support by NSMP. Training and hardware support has decreased by 50% and the mentoring and support provided by the HRDOs reduced by 70% (time now used by them to focus on transferring their skills to the 'change agents'). NSMP has monitored the QOC given since this reduction in project support and are generally satisfied that standards are being reasonably maintained.

The success of the Phase One hospital management committees in generating local resources for sustained support of emergency supplies and services meant that NSMP planned from the outset on involving the Phase Two hospital management committees to ensure their support.

4.3.2. Developing teamwork and a desire to provide care

The concept of teamwork was difficult to put into practice because of the hierarchical nature of Nepali culture. Traditionally, staffs are expected to follow instructions without question and not express their concerns or opinions to their seniors. The result of this institutional climate was apathy. Through the QOC development process, the environment radically changed. A team mentality developed, with support staff and service providers working together with common purpose. For example, a cleaner now attends infection prevention meetings alongside the hospital medical superintendent and feels comfortable enough to give his suggestions on infection prevention practices, knowing that quality is everyone's responsibility. Management skills have improved, as has communication among colleagues. Providers now show a discernable pride, and the degree of respect towards both each other and clients is appreciably greater.

The reputation and high profile gained by the three Phase One hospitals within the national Safe Motherhood Program adds to the continuing pride that these hospitals place in the quality of their services.

4.3.3. EmOC utilization data

All 3 sites have increased the met-need for EMOC and cesarean sections. Although progress is slow (approx. 2–3% increase in met-need a year) and the gap between met-need and unmet need remains unacceptably high, the flow of patients and hospital workload has significantly increased.

4.3.4. Replication of model

In addition to NSMP's own scale-up of application of the District EmOC model (and QOC approach) from three districts to 10, the FHD began in 2002 to replicate the model in another district without project support. A few important

changes are already occurring in this hospital: clear job descriptions have been drafted; the management committee mobilizes resources more effectively; and a stronger maternity team—comprising doctors, nurses and support staff—is already evident.

5. Conclusions

NSMP's District EmOC model is a package of inputs: improved physical facilities, upgraded equipment and supplies, extensive training, and addressing of community-level barriers to EmOC. The QOC approach is only one component of this package. It is difficult to weight the contribution of each individual component to the overall improvement of service and NSMP firmly believes that the components act in synergy. We propose that introducing a QOC approach, without other inputs, would have been less effective, while its inclusion maximized the overall beneficial effect.

As a result of the catalytic nature of the QOC approach, service providers and managers have gained a degree of self-confidence that allows them to manage resources more effectively and to resolve local problems without external intervention. Hospital management committees are impressed with the improvements they see and respond to further requests for support, allocating additional resources to emergency drugs, increased staffing, replacement of infection prevention supplies, and blood for women in need of transfusion.

This successful program the QOC approach of this project increased the use of EmOC, Furthermore, HMGN appreciated how QOC improvements could be realistically addressed. The revised QOC approach (as presented in the manual 'Guide for Quality Obstetric Care')—and the HMGN's commitment to replicating the project– is testament to the success. The very process of developing and implementing a QOC approach acts as a catalyst to bring about change. NSMP believes using such an approach, as part of a package to increase access to EmOC, is useful to other countries committed to enhancing the quality of services—even where resources are scarce.

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