Obstetric Care and Health System Responsiveness for Hospital-Based Delivery in Lao People's Democratic Republic

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Objective: *To assess obstetric care and health system responsiveness for hospital-based delivery care in Lao PDR, and associated factors.*
Material and Method: *A cross-sectional study was conducted in two provincial hospitals in Lao PDR between June and October 2010. All delivered women were interviewed for their perception of health system responsiveness and their medical records were reviewed for the obstetric care they received.*
Results: *Five hundred eighty one women participated in this study. The mean scores of obstetric care and health system responsiveness were 19.5 ± 2.5 and 31.6 ± 1.5, respectively. The mean score of overall performance was 51.0 ± 2.8. Of the two hospitals, designated as Hospital A and Hospital B, the health responsiveness was rated lower in women undergoing cesarean section and delivering in Hospital B. Male doctor or obstetrician or delivery in Hospital B was significantly associated with higher obstetric care and overall performance.*
Conclusion: *Different health system responsiveness for the delivery care between the two hospitals was found. Strategies to improve obstetric care need to be discussed and studied.*

Keywords: *Health system responsiveness, Hospital-based delivery care, Obstetric care, Essential skills, Skilled birth attendant*

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Maternal morbidity and mortality are common in Sub-Saharan Africa and Asia[1]. Globally, facility-based delivery by a skilled birth attendant and the availability of emergency obstetric care in a facility are recommended to reduce maternal mortality and severe morbidity[2]. However, the rate of delivery in a special medical facility is still low, particularly in developing countries, and this low rate has been shown to be associated with the perception of poor quality care and a lack of qualified health facilities[3,4]. Importantly, poor quality of care was reported in countries where the maternal mortality ratio was high[4].

According to the WHO, a skilled birth attendant is defined as "an accredited health professional such as a midwife, doctor or nurse who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management, and referral of complications in women and newborns"[5]. Following this definition, a doctor or nurse in a facility should be able to provide routine care for delivery and basic management of emergency obstetric care to all delivered women[1,5]. A consensus statement from WHO African regional offices agreed upon the essential skills of competency in care during labor and birth, including routine care for normal delivery and basic management for specific complications in 2006 (Table 1)[6].

Apart from specific obstetric care, the non-medical behavior of health personnel and system, as measured by health system responsiveness, is also important when considering overall quality of care[7]. According, again, to the WHO guideline, health system responsiveness comprises eight domains: respect for the dignity of persons; autonomy of participation by involvement in decision making; confidentiality of information during the course of care; prompt attention; adequate quality of basic amenities; clarity

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Table 1. Criteria of obstetric care assessments modified from essential skills of competency in labor and birth recommended by African WHO regional consensus[6]

Topic	Evaluation items
Routine delivery care	
Initial assessments	1) Taking history
	2) General examination
	3) Abdominal examination
	4) Labor pain and uterine contraction
	5) Vaginal examination
Labor management	6) Progress of labor using the partograph
	7) Emotional support
Delivery management	8) Signs and symptoms of second stage
	9) Immediate care of the newborn
Immediate postpartum management	10) Oxytocin or methergin use
	11) Rubbing up a contraction
	12) Vaginal examination
	13) Recording blood loss
	14) Evaluation of placenta and membranes
	15) Vital signs of mother's condition
Special care for complicated delivery	
Management of postpartum hemorrhage	Empty bladder, oxytocin use, intravenous infusion by fluid, detecting of hemorrhagic shock, manual removal of placenta, removal of retained pieces of placenta, repair of soft tissue
Management of pregnancy-induced hypertension	Measuring blood pressure, examination of edema, urinalysis of proteins, detecting preeclamptic signs and symptoms, utilization of anticonvulsants
Management of immediate infection causes	Management of infections, detection of infection cause, providing parenteral antibiotics and other therapies
Removal of retained placenta	Premedication prior to performing the manual removal of placenta, sterile techniques, examination on removal of placenta, use of oxytocin
Dystocia delivery	Performing vacuum or forceps extraction or caesarean section
Shoulder dystocia	Helping the baby have safe delivery without birth asphyxia, detecting the baby with shoulder dystocia before delivery
Breech presentation	Detecting the baby with breech presentation before delivery, caesarean section
Birth asphyxia	Resuscitation of baby with birth asphyxia before referral, recording Apgar scores

of communication for care and treatment; access to social support from family and community; and choice of health care providers[8,9].

A recent study found the maternal mortality ratio in Lao People's Democratic Republic (Lao PDR) was high and the proportion of births in a facility was low[10]. Quality of both medical and non-medical perspectives for delivery care is crucial before delivery in a facility by a skilled birth attendant would be promoted. However, these factors have not been assessed in Lao PDR. There is a critical need for a better understanding of the current status of Laotian maternal health care and related information that could help identify potential strategies to improve service utilization and maternal outcomes. Therefore, the present study aimed to assess obstetric care based on

essential competency skills and health system responsiveness for hospital-based delivery care in the provincial hospitals in Lao PDR, and associated factors.

Material and Method

Study setting

A cross-sectional study was conducted between June and October 2010 at two provincial hospitals in Lao PDR, designated as Hospital A and Hospital B. These two hospitals were selected to be study settings since these are the provincial hospitals in the central region that are responsible for delivery care within the provinces, and comprehensive emergency obstetric care with health insurance is available. In 2010, reports from the Provincial Maternal and Child Health offices showed the rates of hospital deliveries to total deliveries in the vicinities of these two specific hospitals to be 61% and 51%. The present study protocol was approved by the National Ethics Committee for Health Research in Lao PDR and the Institute Ethical Research Committee of the Faculty of Medicine, Prince of Songkla University, Thailand.

Study participants

The present study participants were women who delivered at the two study hospitals during the study period. As the authors had no previous studies to work with, the sample size was calculated based on an estimated achievement of care in 60% of the subjects, with a 95% confidence interval, precision of 5%, and design effect of 1.5, and to meet these targets at least 554 women were needed. All skilled birth attendants currently working at the present study facilities during the study period were also interviewed.

Data collection process

Preparatory phase

The present study was approved by the involved hospital directors before the data collection was begun. One public health officer, who did not work in either of the hospitals, was trained by the principal investigator in the process of conducting the interviews. The routine reporting systems of the medical records of the women who delivered at each hospital were also reviewed by the investigators. The investigators discussed the reporting systems and information in the medical records with the health providers before the data collection started to ensure they had an understanding of the systems.

Data collection phase

All women who delivered at the hospitals during the study period were approached by the interviewer at 24 to 48 hours postpartum and invited to participate in the study. After the consent form was signed, the interview was carried out in a private room. All women were informed that their responses would be anonymous and confidential. Their opinions on the responsiveness of the health system were assessed during a face-to-face 20 to 30 minute direct interview using a structured checklist[11]. Obstetric care was measured by the principal investigator by reviewing the medical records of the interviewed women using a structured checklist of essential skills of competency[9].

Variables

The two main outcome measures in the present study were the obstetric care received by each patient, as assessed by the researcher, and health system responsiveness, as revealed through the patient interviews. Fifteen items of essential skills in labor and birth were used as the criteria of measuring obstetric care (as shown in Table 1). The responses of all items of routine care for delivery were scored quantitatively with a score of zero for "not performed", one for "not completely performed", and two for "completely performed". Total scores for routine care ranged from 0 to 30. Management of specific complications was described qualitatively.

Face validity was used for evaluating the validity of items in each domain. Eight domains of health system responsiveness for women's current delivery care were translated using a back translation. The number of items of each domain varied, with seven for dignity, five for clear communication, and three for autonomy, confidentiality, prompt attention, social support, basic amenities and choice of providers. The responses of the items were rated "1 = very bad", "2 = bad", "3 = moderate", "4 = good", and "5 = very good". The scores from each domain were averaged to be 1 to 5, resulting in a total score of all domains ranging from 8 to 40. In addition, the influence of the health system's responsiveness on the women's decision to deliver in the hospital was also ranked from the most to the least influence without repetitive ranking. The rankings were scored, summed, and then averaged. Higher scores indicated a greater influence on their decision.

Independent variables included the women's and provider's characteristics. The women's characteristics were demographic and socioeconomic

status (age, religion, ethnicity, occupation, education, and monthly family income), and obstetric information (gravidity, parity, route of delivery, current pregnancy, and delivery complications). The characteristics of the providers who mainly assisted the woman's delivery were age, gender, type of provider, and working years.

Data analysis

Double data entry and validation were done using Epidata version 3.1 software and analyzed by R software version 2.12.1 (The R Foundation for Statistical Computing, Austria, 2010). Women's characteristics between two studied hospitals were analyzed by Chi-square or Fisher's exact test for categorical variables and Wilcoxon Ranksum test for continuous variables. Scores of obstetric care and health system responsiveness were calculated descriptively. Overall performance was analyzed by summing the scores of obstetric care and health system responsiveness. The obstetric care, health responsiveness, and overall performance were presented as mean and standard deviation. The factors associated with obstetric care, health system responsiveness and overall performance were analyzed by a linear mixed-effects model fitted by maximum likelihood adjusting for the clustering of delivered women within a skilled birth attendant. Factors in the final model were presented as coefficient and standard error and considered as significant when the p-value was less than 0.05.

Results

Fig. 1 shows a flow chart of the study participants in two study hospitals. Of the 581 women recruited, 273 (46.9%) delivered at hospital A and 308 (53.1%) at hospital B. Their ages ranged from 16 to 46 years (mean ± SD 25.2 ± 5.3 years). The socio-demographics of the women are shown in Table 2.

The scores the women gave for their impressions of the obstetric care they received ranged from 12 to 29 (out of a possible top score of 30), with a mean of 19.5 (SD 2.5). Table 3 shows the performance of birth attendants based on the essential skills. When the researchers evaluated the obstetric care scores in skill items, common items leading to low scores were no reported partogram (52.7%) and no record of estimated blood loss in delivery (40.9%). Thirteen percent of the women overall developed specific complications, such as postpartum hemorrhage, pregnancy-induced hypertension, dystocia, abnormal presentation, cord prolapse, or rupture of membranes more than 12 hours prior to delivery. These complicated patients received special management based on obstetric care criteria. The achievement of obstetric care, health system responsiveness and overall performance at the authors' cut-off point level of > 75% were 13.4%, and 95.5% and 12.0%, respectively.

The health system responsiveness scores ranged from 24 to 40 (out of a possible top score of 40, mean ± SD 31.6 ± 1.5). The average score of all domains of responsiveness was 4 out of 5, except the score for basic amenities, which was 3.8 and choice of provider was 3.9. The prioritized domains of health system responsiveness, which influenced the woman's decision to deliver at the hospital, were ranked in descending order as follows: dignity, clear communication, autonomy, prompt attention, confidentiality, social support, basic amenities, and choice of provider. The scores of overall performance ranged from 42-61 (out of the top possible score of 70, mean ± SD 51.0 ± 2.8).

Table 4 presents the factors associated with obstetric care, health system responsiveness and overall performance by a linear mixed-effects model fitted by maximum likelihood adjusting for the clustering of delivered women within the care of a single skilled birth attendant. In the final model of analysis, the women's characteristics were not significantly associated with the scores of obstetric care, health system responsiveness, or overall

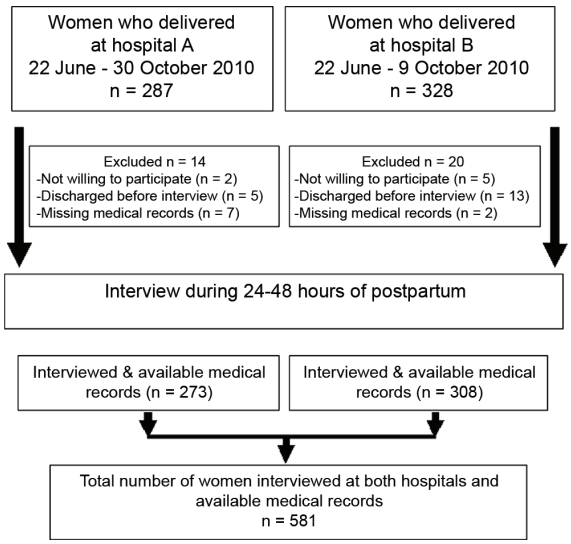

Fig. 1 A flow chart of study participants

Table 2. Women's characteristics in the two hospitals

Characteristic	Hospital		p-value
	Hospital A, n (%) (n = 273)	Hospital B, n (%) (n = 308)	
Age (years)			0.13*
< 20	39 (14.3)	33 (10.7)	
20-34	219 (80.2)	247 (80.2)	
> 35	15 (5.5)	28 (9.1)	
Religion			0.10**
Buddhist	255 (93.4)	299 (97.1)	
Christian	5 (1.8)	2 (0.6)	
Animist	13 (4.8)	7 (2.3)	
Ethnicity			0.06*
Laolum	254 (93.0)	298 (96.8)	
Other	19 (7.0)	10 (3.2)	
Education			<0.001*
Illiterate	6 (2.2)	29 (9.4)	
Primary school	110 (40.3)	73 (23.7)	
Secondary school	145 (53.1)	190 (61.7)	
University or higher	12 (4.4)	16 (5.2)	
Occupation			0.34*
Housewife	99 (36.3)	96 (31.2)	
Officer	52 (19.0)	51 (16.6)	
Merchant	43 (15.8)	59 (19.2)	
Farmer	79 (28.9)	102 (33.1)	
Monthly family income (US$)			<0.001***
Median (IQR)	100 (64.5, 169.8)	80 (40.0, 140.0)	
Gravity			0.01*
Primigravida	157 (57.5)	144 (46.8)	
Multigravida	116 (42.5)	164 (53.2)	
Parity			0.03*
0	157 (57.5)	145 (47.1)	
1-2	99 (36.3)	127 (41.2)	
3-4	14 (5.1)	28 (9.1)	
> 4	3 (1.1)	8 (2.6)	
Route of delivery			0.07*
Normal delivery	234 (85.7)	280 (90.9)	
Caesarean section	39 (14.3)	28 (9.1)	
Pregnancy complications			0.02*
No	252 (92.3)	265 (86)	
Yes	21 (7.7)	43 (14)	
Delivery complications			0.21*
No	270 (98.9)	299 (97.1)	
Yes	3 (1.1)	9 (2.9)	
Type of birth attendants			<0.001*
Nurse or midwife	166 (60.8)	234 (76.0)	
Doctor or obstetrician	107 (39.2)	74 (24.0)	

* Chi-square test, ** Fisher's exact test, *** Wilcoxon Ranksum test

Table 2. (cont.)

Characteristic	Hospital		p-value
	Hospital A, n (%) (n = 273)	Hospital B, n (%) (n = 308)	
Age of birth attendants (years)			0.92*
≤ 35	80 (29.3)	88 (28.6)	
> 35	193 (70.7)	220 (71.4)	
Gender of skilled birth attendants			0.28*
Male	46 (16.8)	41 (13.3)	
Female	227 (83.2)	267 (86.7)	
Working years of skilled birth attendants			0.01*
≤ 5	26 (9.5)	52 (16.9)	
> 5	247 (90.5)	256 (83.1)	
Specific refresher training in obstetric care			<0.001*
No	116 (42.5)	50 (16.2)	
Yes	157 (57.5)	258 (83.8)	

* Chi-square test, ** Fisher's exact test, *** Wilcoxon Ranksum test

Table 3. Performance of essential skills

Items	Performance of essential skills		
	Not performed n (%)	Partially performed n (%)	Completely performed n (%)
Taking history	0	284 (48.9)	297 (51.1)
General examination	0	15 (2.6)	566 (97.4)
Abdominal examination	1 (0.2)	65 (11.2)	515 (88.6)
Labor pain and uterine contraction	3 (0.5)	448 (77.1)	130 (22.4)
Vaginal examination	0	89 (15.3)	492 (84.7)
Progress of labor using a partograph	306 (52.7)	162 (27.9)	113 (19.4)
Emotional support	5 (0.9)	576 (99.1)	0
Signs and symptoms of second stage	9 (1.5)	518 (89.2)	54 (9.3)
Immediate care of the newborn	1 (0.2)	395 (68.0)	185 (31.8)
Oxytocin or methergin use	0	518 (89.2)	63 (10.8)
Rubbing up a contraction	0	560 (96.4)	21 (3.6)
Vaginal examination	53 (9.1)	488 (84.0)	40 (6.9)
Recording blood loss	238 (40.9)	292 (50.3)	51 (8.8)
Evaluation of placenta and membranes	5 (0.8)	467 (80.4)	109 (18.8)
Vital signs of mother's condition	0	3 (0.5)	578 (99.5)

performance. Gender and types of providers and hospital were the significant factors for obstetric care and overall performance. Women who underwent cesarean section and delivered in hospital B rated a lower score of health system responsiveness significantly compared to those delivered vaginally and in hospital A.

Discussion

The quality of care as measured by the performance of essential skills in labor and delivery, and the responsiveness of the health system, were moderate and high, respectively. Male, doctor or obstetrician or skilled birth attendant who worked in Hospital B were significantly associated with better

Table 4. Factors associated with obstetric care, health system responsiveness and overall performance

Factors	Obstetric care Total scores = 30		Health system responsiveness Total scores = 40		Overall performance Total scores = 70	
	Coefficient (SE)	p-value	Coefficient (SE)	p-value	Coefficient (SE)	p-value
Intercept*	19.6 (2.5)	-	31.9 (1.5)	-	51.0 (2.8)	-
Route of delivery (Ref: vaginal delivery)						
Cesarean section	-	-	-0.5 (0.2)	0.02	-	-
Gender of skilled birth attendant (Ref: male)						
Female	-1.5 (0.3)	<0.001	-	-	-1.0 (0.4)	0.02
Type of skilled birth attendant (Ref: nurse or midwife)						
Doctor or obstetrician	1.4 (0.3)	<0.001	-	-	1.6 (0.3)	<0.001
Hospital (Ref: hospital A)						
Hospital B	1.2 (0.2)	<0.001	-0.6 (0.2)	<0.01	0.6 (0.2)	<0.01

SE = standard error; Ref = reference group
* Intercept: baseline scores without factors

scores of the obstetric care and overall performance for delivery care. Health system responsiveness was rated lower in women undergoing cesarean section and delivering in Hospital B.

In the present study, the routine delivery of care was assessed through a medical record review using a checklist of the essential skills recommended by the African WHO consensus[6], since it is the currently accepted standard for essential obstetric care[12]. Most previous studies that examined the effect of skilled birth attendance on overall delivery care have been conducted in developing countries such as Indonesia, Ghana, Africa, Eritrea, and Nepal[13-17]. There have been a variety of ways of assessing care in these studies, including self-reporting[13], medical record review[14,16], observation[13,15,17] and clinical examination[13]. In addition, various scorings were used in the evaluations, for example, rating a score of zero for non-recording and a score of one for recording skills reported in the medical records[16] or scores of 1 (the least) to 3 (the most) for competencies rated by providers or observer's self-assessment[13]. Reviewing medical records can be applied on a wider scale than observation and clinical examination, and produces less bias than self-reporting[18].

Obstetric skills for basic management in normal delivery, detection of emergencies or complications and referral procedures are necessary skills for all skilled birth attendants, either doctors or nurses. Although different methods of measurement were used in the studies referenced above, similar findings of inadequate obstetric care were reported[14-16]. The authors in a study from Eritrea claimed that low score of evaluation on performing partograph could not be explained whether not recording the partograph was due to a lack of partograph forms or a lack of trained personnel to fill in the partographs[14]. In the present study, the authors found that not performing the report in a partograph during labor was mostly observed, although a form of partograph was found in the medical records of the studied women. The failure to do a partograph as part of standard procedure raises the concern that deliverers might not recognize the onset of a complication in a timely fashion[15].

Health system responsiveness was used to measure the way individuals are treated and the environment in which they are treated[8]. Three common methods for measurement of health system responsiveness are a scale directly rating a number domains detailing the perceptions of the patient concerning the responsiveness of the system, rating

the various domains of responsiveness in terms of their importance, and assessing responsiveness using vignettes describing hypothetical scenarios of services[19]. Most earlier studies examined health system responsiveness concerning overall healthcare services from population surveys by asking about the patient's experiences of receiving care as in- or ambulatory patients, using either a rating scale and/or ranking importance to measure health system responsiveness[20-22].

Although the variety of reporting across populations can be controlled by the use of vignettes, there has been no strong evidence to indicate systematic differences in reporting behavior of respondents[23], and there are no vignettes related to delivery care available. As a result, direct ratings of each domain and ranking of all domains concerning their relative importance were chosen in the present study. The lowest average score was in the domain of basic amenities, indicating that most respondents felt that the basic amenities needed to be improved. This finding was similar to a previous study from Germany[21]. The prioritization of domains found in our study was similar to the rankings found in previous studies, particularly the three highest rated domains: dignity, prompt attention, and communication[21,22]. A study in Thailand found dignity and prompt attention were the most important domains[20]. However, these previous studies did not involve delivery care services. Only one study from Ghana measured factors related to the performance of skilled birth attendants[16]. That study found that a better obstetric performance was rated for doctors or obstetricians than for nurses or midwives, which the present study also found.

There were some limitations in the present study. First, the present study was based on data from women who gave birth in a hospital, thus whether the quality of healthcare service influenced the utilization of healthcare service could not be evaluated. Second, the assessment of care of complicated cases was limited due to the low number of subjects. Third, the reasons for inadequate obstetric care and low health system responsiveness were not determined. Finally, generalizability of findings is limited to delivery care located in the provincial hospitals of Lao PDR.

The present study evaluated obstetric care and health system responsiveness of skilled birth attendance concurrently. Further studies to identify the causes of the low rate of partograph use and recording of estimated blood loss in delivery in Lao PDR are needed. The evaluation methods and findings of the present study will be useful for hospitals in countries that need to better understand the current status of maternal health care and identify potential strategies to improve birth and maternal outcomes.

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Potential conflicts of interest

The authors guarantee that the article has not been published elsewhere and not being considered for publication elsewhere. It has been submitted with the full knowledge and approval of the institution or organization given as the affiliation of the authors.

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การดูแลระหว่างการคลอดและการตอบสนองผู้รับบริการต่อระบบบริการคลอดในโรงพยาบาลในประเทศลาว

เดาเวียง ดวงวิจิตร, ทิพวรรณ เลียบสื่อตระกูล

วัตถุประสงค์: *เพื่อประเมินการดูแลระหว่างการคลอดและการตอบสนองผู้รับบริการต่อระบบบริการคลอดในโรงพยาบาลในประเทศลาวและปัจจัยที่เกี่ยวข้อง*

วัสดุและวิธีการ: *การศึกษานี้เป็นการวิจัยแบบตัดขวางในโรงพยาบาลระดับจังหวัดจำนวนสองแห่งในประเทศลาวในช่วงเดือนมิถุนายน ถึง เดือนตุลาคม พ.ศ. 2553 โดยหญิงหลังคลอดได้รับการสัมภาษณ์เกี่ยวกับการรับรู้สำหรับการตอบสนองผู้รับบริการต่อระบบบริการคลอด และการทบทวนการดูแลระหว่างการคลอดในแฟ้มเวชระเบียน*

ผลการศึกษา: *ข้อมูลจากหญิงหลังคลอดจำนวน 581 ราย พบว่าให้การประเมินการตอบสนองการบริการคลอดของโรงพยาบาลเท่ากับ 31.6 ± 1.5 และเมื่อประเมินการดูแลการคลอดจากแฟ้มเวชระเบียนได้ค่าเฉลี่ยของการดูแลเท่ากับ 19.5 ± 2.5 ส่วนค่าเฉลี่ยของคุณภาพการดูแลโดยรวมเท่ากับ 51.0 ± 2.8 ผลการประเมินการตอบสนองผู้รับบริการต่อระบบบริการคลอดพบว่าคะแนนการตอบสนองการบริการต่ำในหญิงที่คลอดด้วยการผ่าตัดคลอดทางหน้าท้อง และคลอดในโรงพยาบาล B เมื่อเทียบกับหญิงที่คลอดเอง และคลอดในโรงพยาบาล A ตามลำดับ การดูแลการคลอดและคุณภาพการดูแลโดยรวมมีความสัมพันธ์อย่างมีนัยสำคัญกับผู้ทำคลอดที่เป็นเพศชาย เป็นแพทย์หรือสูติแพทย์ หรือ ทำงานในโรงพยาบาล B*

สรุป: *การตอบสนองผู้รับบริการต่อระบบบริการคลอดระหว่างโรงพยาบาลระดับจังหวัดสองแห่งมีความแตกต่างกัน การดูแลการคลอดมีความจำเป็นที่ต้องพัฒนาโดยศึกษาหายุทธศาสตร์ที่เหมาะสมต่อไป*