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Training Evaluation Report MotherCare/Indonesia

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Abbreviations

ACNM	American College of Nurse Midwives
BDD	Bidan di Desa (Trained Midwife working in a village)
Bidan	Trained Midwife working at a facility level
CE	Continuing Education
HMHN	*Healthy Mother and Healthy Newborn Care* Manual
IBI	Ikatan Bidan Indonesia (National Midwifery Association)
LSS	Life Saving Skills
MOH	Ministry of Health
PIH	Pregnancy Induced Hypertension
PP	Postpartum
PR	Peer Review
TBA	Traditional Birth Attendant

Executive Summary

To improve the knowledge and skills of facility-based midwives (bidan) and village-based midwives (bidan di desa), MotherCare has worked with the Indonesian Ministry of Health (MOH) and the Indonesian Midwifery Association (IBI) to develop a training and continuing education system in three districts in South Kalimantan—Banjar, Barita Kuala, and Hulu Sungai Selatan (HSS). With technical assistance from the American College of Nurse Midwives (ACNM), Life Saving Skills (LSS) training was adapted to meet the needs of the midwives and the community. Three LSS training centers in South Kalimantan were established based on their capacity to support competency-based training, particularly the availability of adequate clinical experience for each participant.

The training of 128 bidan in LSS was conducted in a series of two-week courses (Advanced LSS) from April 8 to September 27,1996 and June 16 to August 8, 1997. The training of the bidan di desa (Basic LSS) began in November 1996 and was completed in September 1998. A total of 268 midwives were trained from the three districts: 60 from Banjar (30%), 68 from Barito Kuala (37%), and 140 from HSS (100%). Two related and on-going programs support the LSS training: Peer Review and Continuing Education (PR/CE). These were developed in collaboration by MotherCare and IBI and are managed by IBI. This model of government-NGO partnership takes advantage of the fact that most government midwives in Indonesia are IBI members, and the partnership maximizes support to the midwives.

In mid-1997, the provincial MOH in South Kalimantan requested MotherCare to establish LSS training centers in the other six districts in the South Kalimantan Province so that more bidan and bidan di desa (BDD) could receive the benefits of the Basic and Advanced LSS training. Unfortunately, the volume of deliveries in the hospitals in these six non-MotherCare districts did not meet the criterion for an LSS training center (at least 15 births per trainee). As an alternative, MotherCare worked with the MOH to develop an LSS Internship Program at these six hospitals.

The objectives of the evaluation were to:

- ***evaluate the ability of the LSS training to increase the knowledge, confidence, and skills of the bidan and BDD in providing quality maternal and newborn care;***
- ***compare the ability of the LSS Internship and MotherCare Programs (LSS & PR/CE) to increase the knowledge, confidence, and skills of the BDD in providing quality maternal and newborn care; and***
- ***obtain feedback from the participants about various training programs and the PR/CE program.***

To achieve these objectives, the evaluation compared groups of bidan and BDD in various levels of in-service education and support. Three groups of bidan were defined:

1. **TRAINED**—bidan from MotherCare districts who received Advanced LSS training and participate in the IBI Peer PR/CE program.
2. **CLINICAL INSTRUCTORS**—bidan who serve as CLINICAL INSTRUCTORS in the Internship Program from non-MotherCare districts (had Advanced LSS training, do not participate in the IBI PR/CE program but received one additional week site prep); and

3. **UNTRAINED**—bidan from non-MotherCare districts who do not participate in any of the MotherCare training or support programs.

The three BDD groups were:

1. **TRAINED BDD**—from MotherCare districts who received Basic LSS training and participate in the IBI PR/CE program;

2. **INTERN BDD**—who participated in the Internship Program from non-MotherCare districts and do not participate in the IBI PR/CE program; and

3. **UNTRAINED BDD**—from non-MotherCare districts who do not participate in any of the MotherCare training or support programs.

The UNTRAINED groups were included to represent the level of knowledge and skills of the TRAINED, CLINICAL INSTRUCTOR, and INTERN groups before they participated in the MotherCare program.

Six tools were designed to capture changes in knowledge, confidence, skills, and application of skills in a clinical situation. Tools five and six captured more qualitative results. The six tools are:

1. Knowledge Test
2. Level of Confidence in Skills Rating
3. Skill Assessment
4 Partograph Review
5 Complications Audit
6 Level of Satisfaction Survey

Five key skills, which were felt to be important to reduce maternal and perinatal mortality and were considered to have had a low competency level among the participants before the training, were chosen for competency assessment. The five skills are:

1 infection prevention (how to get equipment ready for the next delivery),
2 use of the partograph,
3 manual removal of the placenta,
4 bimanual compression for the management of postpartum hemorrhage, and
5 neonatal resuscitation

The results of the evaluation found that the MotherCare LSS training programs significantly improved the knowledge, confidence, and skills of the bidan and BDD. The bidan and BDD who received the training scored higher on the knowledge test and in all five skills than UNTRAINED bidan and BDD Clear differences were seen in the management of complicated cases described between the TRAINED and UNTRAINED groups Of the bidan and BDD who participated in the MotherCare training program, significantly more were "competent" (defined as a score of $\geq$70%) than untrained bidan and BDD in their knowledge and ability to perform the key skills of manual removal of the placenta, neonatal resuscitation and use of the partograph. Little differences were observed in knowledge and skills when TRAINED bidan who received Advanced LSS training and participated in PR/CE programs were compared to the CLINICAL INSTRUCTOR bidan who also received Advanced LSS training but did not participate in the PR/CE programs.

The Internship Program increased the knowledge and skills of the BDD, but not to the same level as the MotherCare LSS training and PR/CE programs. The TRAINED BDD scored significantly higher than the UNTRAINED BDD in the skill assessment for manual removal of the placenta, bimanual compression, and neonatal resuscitation. However, the limitations of a two-week, in-service education program to increase the skill level of the bidan and BDD to an acceptable level need to be recognized. Not all the participants in the training programs achieved high levels of competency in all five skills. A short, in-service education course can not substitute a two to three-year midwifery program.

The content and structure of the MotherCare training program seem to be appropriate for the needs of the bidan and BDD. The level of satisfaction by the participants is high, and the content provides the necessary skills for the providers to adequately manage the most frequent complications. Some of the participants requested more practice during the training to gain more clinical experience. Peer Review and Continuing Education Programs appear to be functioning and are well-received by the bidan and BDD.

Introduction

To improve the knowledge and skills of facility-based midwives (bidan) and village-based midwives (bidan di desa), MotherCare has worked with the Indonesian Ministry of Health (MOH) and the Indonesian Midwifery Association (IBI) to develop a training and continuing education system in three districts in South Kalimantan—Banjar, Barita Kuala, and Hulu Sungai Selatan (HSS). To build on the national strategy to improve maternal and newborn care at the community level, MotherCare has worked with the MOH to ensure the presence of a "competent" village midwife at every delivery, exclusive of whether the actual delivery is by the village midwife or the traditional birth attendant (TBA). This strategy is expected to decrease the iatrogenic causes of obstetric and neonatal complications and to increase the opportunity for recognition of complications, for initiation of management in the early stages of a complication, and for more prompt referrals when necessary.

With technical assistance from the American College of Nurse Midwives (ACNM), the Life Saving Skills (LSS) training was adapted to meet the needs of the midwives and the community, as determined by a training needs assessment conducted in South Kalimantan, in November 1995. The bidan were found to need reinforcement in the handling of obstetrical emergencies and to have the clinical volume to maintain these skills once trained. However, because the bidan di desa (BDD) were fairly new in the community and had limited clinical volume (average of about one delivery per month), the LSS training content was modified to reinforce their knowledge of the normal aspects of antenatal, labor and delivery, and postpartum care, as well as in the management of postpartum hemorrhage and neonatal asphyxia.

The training needs assessment also indicated that the BDD needed support to become better integrated into the communities they service MotherCare and ACNM developed a new manual, *Healthy Mother and Healthy Newborn Care* (HMHN), to meet the needs of the BDD. The bidan LSS training became known as Advanced LSS (the full ten modules in the *LSS 2nd edition*) and the BDD training as Basic LSS (*Healthy Mother and Healthy Newborn Care* and the LSS module on hemorrhage and neonatal resuscitation).

LSS training centers in South Kalimantan were selected based on their capacity to support competency-based training, particularly the availability of adequate clinical experiences for each participant Two hospitals, Ulin (provincial hospital for South Kalimantan) and Banjarbaru (Banjar district hospital), were initially selected, and in 1996, work began to establish them as LSS training facilities At the urging of the MOH a third training center was established at the Ratu Zalecha hospital (district hospital in Matapura, Banjar) in March 1998. Each hospital underwent a one-week site preparation, during which the training program was introduced, clinical protocols were revised as needed, and they were agreed upon by all relevant staff to be consistent with the LSS training, and procedures for the use of the partograph and infection prevention were established. A "Mini-LSS" training for all the staff in the antenatal, labor and delivery, and postpartum wards was conducted at each training center to ensure that the facility, as a unit, was using the same skills and techniques that were taught in LSS

LSS trainers received a two-week Training of Trainers for clinical skills in LSS and a one-week Training of Trainers for training skills in March and April 1996. The training approach for the Training of Trainers using the same competency-based training, participatory learning methods, and adult learning principles, was as important to establishing the quality of the training team as the review of the clinical content Five trainers from each facility were trained to be trainers. Additional trainers (two from Ulin Hospital and one from Banjarbaru Hospital) were trained with the five

trainers from the Ratu Zalecha hospital. These additional trainers provide backup to the trainers at the two initial training centers. There are now 18 LSS trainers throughout the three centers in South Kalimantan.

The training of 128 bidan in LSS was conducted in a series of two-week courses from April 8 to September 27, 1996 and June 16 to August 8, 1997. The trainees included: nine clinical instructors from local midwifery schools, 13 hospital midwives, two midwives from the district health office, two midwives from IBI, and 108 health center midwives.

Since the LSS Trainers were expected to train BDD on different clinical content (Basic LSS) than that for the hospital and health center bidan (Advanced LSS), the trainers were given a separate clinical Training of Trainers for the Basic LSS course on November 11 to 22, 1996. The BDD training began in November 1996 and was completed in September 1998. MotherCare trained 284 village midwives from the three districts: 84 from Banjar, 60 from Barito Kuala, and 140 from HSS. As of March 1999, 52 percent of the BDD in the three MotherCare districts had received LSS training: Banjar (35%), Barito-Kuala (39%), and HSS (93%) (*1999 Bidan di Desa Survey*, MotherCare).

The training for bidan and BDD has been complemented by other supporting activities. In September 1997, two "Mini-LSS" workshops were conducted over a two-day period for the doctors and midwives who had not received LSS training at the district hospitals and health centers within the MotherCare districts. They were given an overview of LSS training with special emphasis on infant resuscitation, infection prevention, use of the partograph, and postpartum hemorrhage. The LSS training is supported by two related programs: Peer Review and Continuing Education (PR/CE). These were collaboratively developed by MotherCare and IBI, and they are managed by IBI. This model of government-NGO partnership takes advantage of the fact that most government midwives in Indonesia are IBI members, and the partnership maximizes support to the midwives.

All LSS-trained bidan in the three districts are trained as Peer Reviewers, and they are expected to visit each other and the BDD who received the in-service education twice a year. Through these peer review visits, the clinical practice of each LSS-trained provider is reviewed based on the standards and protocols taught during the LSS training Providers also receive additional support and information as needed. The results of the peer review visits are discussed in semi-annual, district Peer Review meetings. From the results of these meetings, decisions are made on the areas in which the bidan and BDD need continuing education This continuing education is offered by specially trained, district continuing educators at regularly scheduled IBI chapter meetings.

The objectives of the MotherCare In-Service Education program in Indonesia were to:

- ***Improve the care provided to mothers and newborns by the bidan and BDD so that bidan and BDD are better able to:***

  - recognize what is happening (normal and abnormal)
    know what needs to be done (management at this level or emergency care with referral)
  - be able to provide care at the expected level of competency for level of the bidan and BDD
  - have the confidence to provide the necessary care

- ***Improve the communication of the bidan and BDD with women and their families so that the bidan and BDD are better able to:***

  — obtain a more complete history from the woman/family
  — initiate discussion with the woman/family about issues that may be sensitive (family planning, need for referral, death)
  — counsel women to improve compliance with treatment/interventions
  — involve the woman/family in decision-making about treatment or management of complications
  — improve record keeping and registers
  — implement the use of partographs by the bidan and BDD
  — improve recording on partographs and other medical records
  — improve the completeness and accuracy of registers

As a result of the process of establishing the training centers and of the training, it is anticipated that the functioning of the medical team within a facility and from one level to another can also improve as providers understand each other's roles and capabilities better.

In mid-1997, the provincial MOH in South Kalimantan requested MotherCare to establish LSS training centers in the other six districts in the South Kalimantan Province so that more bidan and BDD could receive the benefits of the Basic and Advanced LSS training. Unfortunately, the volume of deliveries in the hospitals in these six non-MotherCare districts did not meet the criterion for an LSS training center (at least 15 births per trainee), and these facilities could not qualify as LSS training centers. However, to meet the MOH's request to train more BDD and to support the MOH's enthusiasm for the LSS training, MotherCare worked with the MOH to develop an LSS Internship Program at these six hospitals. The Internship Program allows BDD to spend time (recommended one month but in reality defined by the hospital) in the hospital, working under the guidance of a clinical instructor to fill gaps in her knowledge and skills, which she identifies.

The preparation of the hospitals to be sites for the LSS Internships included: procurement of equipment and supplies for the hospitals, orientation of hospital directors and the district-level MOH to LSS training, and LSS training of four clinical instructor midwives from each hospital at the Ulin LSS Training Center (October 1997) The establishment of the Internship Program has also meant conducting "Mini-LSS" training, site preparation, and an orientation to the LSS Internship Program at each hospital. The MotherCare long-term advisor, a midwife-intern from ACNM, and the LSS trainers from the Ulin, Banjarbaru, and Ratu Zalecha hospitals worked in teams to visit each district hospital for one week to conduct the preparation activities (June to August 1998). Because of this effort, MotherCare has been able to explore additional ways to meet the need to upgrade the knowledge and skills of the large numbers of BDD in the field as rapidly as possible.

Methods

The objectives of the training evaluation were to:

- ***evaluate the ability of the LSS training to increase the knowledge, confidence, and skills of the bidan and BDD in providing quality maternal and newborn care;***

- ***compare the ability of the LSS Internship and MotherCare Programs (LSS & PR/CE) to increase the knowledge, confidence, and skills of the BDD in providing quality maternal and newborn care; and***

- ***obtain feedback from the participants about various training programs and the PR/CE program.***

To achieve these objectives, the evaluation team compared groups of bidan and BDD in various levels of in-service education and support. Three groups of bidan were defined:

1. **TRAINED**—bidan from MotherCare districts who received Advanced LSS training and participate in the IBI PR/CE program;

2. **CLINICAL INSTRUCTORS**—bidan who serve as clinical instructors in the Internship Program from non-MotherCare districts (had Advanced LSS training, do not participate in the IBI PR/CE program but received one additional week site prep); and

3. **UNTRAINED**—bidan from non-MotherCare districts who do not participate in any of the MotherCare training or support programs

The three BDD groups were

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3. **UNTRAINED BDD**—from non-MotherCare districts and do not participate in any of the MotherCare training or support programs

To evaluate the first objective *(the ability of the LSS training to increase the knowledge, confidence, and skills of the bidan and BDD in providing quality maternal and newborn care)*, comparisons of scores and responses were made among four different pairs:

1 **TRAINED** bidan versus **UNTRAINED** bidan
2 **TRAINED BDD** versus **UNTRAINED BDD**
3 **TRAINED** bidan versus **CLINICAL INSTRUCTOR** bidan
4 **CLINICAL INSTRUCTOR** bidan versus **UNTRAINED** bidan

To evaluate the second objective (*compare the ability of the Internship and MotherCare Programs (LSS & PR/CE) to increase the knowledge, confidence, and skills of the BDD in providing quality maternal and newborn care*), comparisons of the scores and responses were made between two different pairs of BDD:

1. **TRAINED BDD** versus **INTERN BDD**
2. **INTERN BDD** versus **UNTRAINED BDD**

The UNTRAINED groups were included to represent the level of knowledge and skills of the TRAINED, CLINICAL INSTRUCTOR, and INTERN groups before they participated in the MotherCare program.

Evaluation Sample

Target sample size was 30 providers for each of group. Only 24 CLINICAL INSTRUCTOR bidan were trained, so this was the maximum possible for the CLINICAL INSTRUCTOR group. All 24 CLINICAL INSTRUCTOR bidan were requested to participate in the evaluation. Thirty-four bidan and BDD who received LSS training were randomly selected from the training participant lists and requested to participate in the evaluation Thirty-four INTERNS were also selected. Thirty-four UNTRAINED bidan and BDD who had not received LSS training were selected from three non-MotherCare districts (Tanah Laut, HST, and Tapin). Letters to request their participation in the evaluation were sent to those selected from District MOH.

Evaluation Tools

Six tools (two of which captured mostly qualitative data) were designed to capture changes in knowledge, confidence, skill, and application of skills in a clinical situation (see **Appendix A**):

1 Knowledge Test
2 Level of Confidence in Skills Rating
3 Skill Assessment
4 Partograph Review
5 Complications Audit
6 Level of Satisfaction Survey

1. **Knowledge Test** (26 questions)
   All questions were case scenarios testing application of knowledge, with one, two-point question excluded from the analysis due to lack of clarity The five categories of questions included: infection prevention (6 points), antenatal care (13 points), care during labor and delivery (12 points), postpartum care (12 points), and family planing (5 points), a total of 48 points. The test took 30 to 40 minutes to complete

2. **Level of Confidence in Skills Rating** (50 questions—53 for bidan)
   This tool was designed to identify participant's self-reported confidence level in specific maternal and neonatal skills Bidan and BDD were asked to answer each question according to their comfort level with "yes" (two points), "a little" (one point), or "no" for no or no response (zero points) Skill questions were grouped by categories. infection prevention (3), IPC/C (6), antenatal care (12), intrapartum care (12), newborn care (6), postpartum care (11), and intrapartum skills related to episiotomy and lacerations (3) (*for bidan only*). Completion of the checklist took ten to 15 minutes

3. **Skill Assessments**

The skill assessment was designed to assess the competency in the application of five selected key skills using case scenarios and models for demonstration of the care provided in particular situations. The five key skills were felt to be important to reduce maternal and perinatal mortality and were considered to have had low competency levels before the training.

1. infection prevention (how to get equipment ready for next delivery)
2. use of the partograph
3. manual removal of the placenta
4. bimanual compression for the management of postpartum hemorrhage
5. neonatal resuscitation

Each action defined in the skill checklist (for infection prevention, manual removal of the placenta, bimanual compression, and neonatal resuscitation) was worth two points if the action was correctly applied, one point if the action was partially correct or prompted, and zero points for not applying or incorrectly applying the action. Clinical and interpersonal skills were evaluated using skill checklists adapted from the HMHN or LSS manuals.

A case study was used for assessing the use of the partograph. The case study included ten observations that were plotted and assessed four times. This was taken into consideration when allocating points. Two points were given if the item was recorded correctly each time it was asked, one point if only some of the time, and zero points if never recorded correctly. This resulted in ten items worth 20 points and categorized as "Completion." In addition, a series of questions worth 17 points assessed the ability of the participant to interpret the observations on the partograph and to suggest management based on the interpretation. These questions were categorized as "Interpretation and Management." The skill assessment took an estimated 1.75 hours per participant.

4. **Partograph Review**

The partograph review was intended to evaluate the use of the partograph by the bidan and BDD Each participant was requested to bring at least five partographs, which the bidan/BDD had completed However, few were brought in and no complicated cases were identified in those reviewed, so this tool was dropped from the analysis.

5. **Complication Audit**

The complication audit was used to identify the types of complications that the bidan and BDD had encountered. It provided an opportunity for each participant to describe her management of a complication in a real-life situation and an opportunity for those who received the LSS or Intern Program training to define how it affected their decision-making and management of the complication Bidan and BDD were also asked to share a recent complicated case. As part of the complication audit, each provider was asked to estimate the number of cases involving the five specific complications (postpartum hemorrhage, prolonged labor, pregnancy-induced hypertension or PIH, fetal distress, and neonatal asphyxia) they had cared for or referred in the past year An interview guide was used to assist with data collection, and the completion of the audit in one-on-one interviews took ten to 15 minutes *(the results from this tool were mostly qualitative)*

6. **Level of Satisfaction Survey**
   A level of satisfaction survey was conducted among providers who had participated in Internship or MotherCare programs. It was designed to identify aspects or skills received in the in-service education that the bidan and BDD found useful and less or not useful. It also solicited recommendations for the training programs and feedback on the Peer Review and Continuing Education programs. The survey took ten to 15 minutes to complete (*the results from this tool were also mostly qualitative*).

Implementation

The evaluation was conducted at one central site in South Kalimantan over a nine-day period. Bidan were evaluated during the first four days and BDD in the last four days. On day five, the participants were combined. Each morning, approximately 20 to 24 participants completed the written knowledge test, level of confidence skill checklist, and the level of satisfaction survey (for those who had participated in one of the training courses). The participants were divided into two groups for the skill assessment and complication audit. One group completed the evaluation in the morning and the other in the afternoon. Five stations were set up for each of the skills in the skill assessment. Performance at each station was evaluated by the same evaluator to facilitate internal consistency. The complication audit was administered at a sixth station as an interview.

Seven bidan-LSS trainers from Jakarta (IBI National and Midwifery Academy) were selected to serve as evaluators at the stations. This provided evaluators who were familiar with LSS but who did not know the participants' training status. Two days were used to orientate the evaluators to the evaluation tools and process. Group meetings were held with the evaluators after each day of evaluation to discuss issues that arose.

Each participant was provided with a unique identifier consisting of an alphabetic letter for each day (A-I) and a number from one to 24 This unique number was used to identify participants' responses throughout the evaluation

Analysis

Data collected in the knowledge test level of confidence in skills rating, and skill assessments were entered daily Double entry was used to screen for data entry errors. These data were analyzed in *EPI-INFO, Version 6.*

Mean scores were calculated for the knowledge test (percent of questions answered correctly), level of confidence skill checklist (absolute and percentage), and clinical skill assessment (absolute and percentage) Overall score for the level of confidence skill checklist was obtained by adding the points for each skill included on the list Overall score for the clinical skill assessment was obtained by averaging the percent mean score for each of the five skills, hence giving each skill equal weight in the overall score Because the mean scores were not necessarily normally distributed, non-parametric statistics (Kruskal-Wallis test) were used to determine P values. Statistical significance was set a $P<0.05$

Seventy percent was chosen as the "passing" score for the knowledge test and the skill assessments The percentage of providers who achieved a score of ≥ 70 percent was calculated to identify the differences among the various, in-service education options. Statistical significance was set a $P<0.05$

Frequency distributions were used to compare response for individual skills with the response dichotomist into YES (demonstrated skill or felt confident) or NO (any other response).

The information included in the complication audit and level of satisfaction with LSS training survey were translated from Bahasa Indonesian and then analyzed. Pertinent quantitative data from these two instruments were hand-calculated.

Results

Description of Participants

The sample size for the UNTRAINED bidan was lower than expected (N=24). It was difficult to identify the bidan who had not participated in the site preparation activities for the Internship Program in the districts from which the UNTRAINED bidan were drawn. When the bidan arrived for the evaluation, it became evident that they were BDD. We attempted to call more bidan from these districts, but again BDD arrived. They were analyzed with UNTRAINED BDD, resulting in a higher number of UNTRAINED BDD (N=47) than in the other BDD groups. See **Table 1** for the number of bidan and BDD, including their training status, place of work, and the number of women for which they provided care around the time of delivery, including referrals, in the two months prior to the evaluation for the participants (June and July 1999).

Table 1
Bidan and Bidan di Desa Place of Work and Reported Number of Deliveries in Two Months Prior to the Evaluation

	Bidan			Bidan di Desa		
	TRAINED	CLINICAL INSTRUCTORS	UNTRAINED	TRAINED	INTERN	UNTRAINED
Number	33	23	24	33	28	47
Place of work						
-Hospital -Health center -Health post -Village -Administrative	1 (3%) 32 (97%)	17 (74%) 1 (4%) 5 (22%)	1 (4%) 22 (92%) 1 (4%)	33 (100%)	28 (100%)	2 (4%) 45 (96%)
Number of deliveries (June & July 1999)						
Mean (SD)	3.8 (2.9)	4.3 (4.1)	4.5 (4.7)	5.5 (5.6)	3.3 (1.3)	3.6 (3.5)
None	6%	22%	25%	3%	0%	9%
1-5	70%	39%	46%	58%	93%	77%
6-10	21%	30%	17%	33%	7%	11%
11-15	3%	9%	13%	3%		2%
>15				3%		2%

The place of work differed among the participants with more of the CLINICAL INSTRUCTORS working in hospitals and almost all of the BDD working in villages. The TRAINED and UNTRAINED bidan were primarily from health centers Although the mean number of deliveries was lower for the TRAINED bidan (3.8) than CLINICAL INSTRUCTOR or UNTRAINED bidan (4 3 and 4.5 respectively), fewer of the TRAINED bidan (6%) reported no deliveries in the two-month period before the evaluation than the CLINICAL INSTRUCTOR (22%) and UNTRAINED bidan (25%). The mean number of deliveries was highest for the TRAINED BDD (5 5), with the INTERN and UNTRAINED BDD reporting 3.3 and 3.6 respectively Less than ten percent of the BDD reported no deliveries in the two-month period before the evaluation

One purpose of the complication audit was to obtain information about the types of complications that the bidan and BDD encountered The complications identified by the Bidan and BDD with this tool are summarized in **Table 2** The column totals add up to more than 100 percent because often more than one complication was included in the case described. Because this information was dependent on the bidan's and BDD's recall of this case as a particular problem, the aggregated information can not be considered representative of the problems in the community. However, it does provide some insight into which complications the bidan and BDD remember as complicated cases and how they managed them

Overall, 172 of the 188 participants could describe a complicated case that they had managed. (91%). By far, the most common complication reported was retained placenta (mentioned by 43% of the bidan and BDD who described a case). Newborn asphyxia was the second most common complication mentioned (20%) followed by prolonged labor (13%) and postpartum hemorrhage (12%). In cases where anemia was mentioned as a complication, all but one case were associated with retained placenta or postpartum hemorrhage. One maternal death, two neonatal deaths, and two stillbirths were reported as outcomes of these complicated cases.

Table 2
Number and Types of Complications Reported in Complication Audit

	Bidan				Bidan di Desa				Over-all Total
	TRAINED	CLINICAL INSTRUCTORS	UNTRAINED	Total	TRAINED	INTERN	UNTRAINED	Total	
Number	33	23	24	80	33	28	47	108	**188**
Reported a case	30	20	21	71	30	27	44	101	**172**
Case with>1 complication	4	8	2	14	8	1	12	21	**35**
Number & Types of complications	**34**	**28**	**23**	**85**	**38**	**28**	**57**	**123**	**208**
Retained placenta	18	9	9	36	15	8	15	38	**74**[1]
Newborn asphyxia	4	3	3	10	5	10	10	25	**35**
Prolonged labor	4	5	1	10	2	3	7	12	**22**
Postpartum hemorrhage	3	1	4	8	5	3	5	13	**21**[2]
Anemia (<8 gm%)	3	5		8	3		5	8	**16**
Pregnancy induced hypertension	1	2	2	5	2	1	2	5	**10**[3]
Antepartum bleeding		1		1	3		4	7	**8**[4]
Breech		1	1	2			3	3	**5**
Shoulder dystocia	1			1	1		1	2	**3**
Incomplete abortion			1	1		1		2	**3**[5]
Postpartum infection			1	1		1		1	**2**
Multiple birth					1		1	2	**2**
Pre-term labor					1		1	2	**2**
Other		1	1	2		1	2	3	**5**[6]

1. Includes one case of placenta accreta
2. Includes atony (18), laceration (2) and ruptured uterus
3. Includes two cases of eclampsia
4. Includes placenta previa (4) and abruptio (1)
5. Includes one case of molar pregnancy
6. Includes diabetes (1), cord prolapse (1), severe dehydration (1), PP edema (1), intrauterine fetal death (1)

Results Related to the Evaluation Objectives

Objective 1:
Evaluate the ability of the LSS training to increase the knowledge, confidence, and skills of the bidan and BDD in providing quality maternal and newborn care

TRAINED Bidan (LSS/PR/CE) versus UNTRAINED Bidan (no LSS/PR/CE)

Knowledge Test

Overall, the TRAINED bidan scored significantly higher than the UNTRAINED bidan with mean scores of 63 and 48 percent respectively (P<0.001). These differences were consistent when the categories of questions included in the knowledge test were compared, see **Table 3**.

Level of Confidence Scores

The TRAINED bidan were significantly more confident than the UNTRAINED bidan (P<0.001) when overall scores in reported confidence in skills were compared, 59 and 47 percent respectively. When categories of skills were compared, TRAINED bidan were more confident in all of their skills except for counseling than the UNTRAINED bidan, see **Table 3** See detailed results for individual skills in **Appendix B, Table B-1.**

Table 3
Absolute and Percent Mean Knowledge and Level of Confidence Scores for LSS TRAINED and UNTRAINED Bidan

	Total points	TRAINED N=33	UNTRAINED N=24	P value
Knowledge test	48	30 2 (63%)	23.2 (48%)	<0 001
Infection prevention	6	4 4 (73%)	3.2 (53%)	0 005
Antenatal care	13	7.9 (61%)	5.0 (38%)	<0.001
Intrapartum care	12	8 2 (68%)	6 5 (55%)	0 002
Postpartum care	12	7 0 (59%)	6 5 (54%)	0.37
Family planning	5	2 7 (55%)	2 0 (40%)	0 006
Level of confidence	106	63 1 (59%)	49 8 (47%)	<0 001
Infection prevention	6	4 0 (66%)	3 0 (51%)	<0 001
Counseling	12	7 8 (65%)	7 4 (62%)	0 45
Antenatal care	24	15 2 (63%)	12 5 (52%)	0 04
Intrapartum care	30	16 8 (56%)	12 0 (40%))	0 001
Newborn care	12	7 5 (62%)	5 5 (46%)	0 004
Postpartum care	22	11 8 (54%)	9 3 (42%)	0 003

Skill Assessments

The TRAINED bidan scored significantly higher than the UNTRAINED bidan on the assessments in all five skills The differences in percent mean scores ranged from 14 percent for infection prevention (63% versus 49%) to at least 35 percent for neonatal resuscitation (59% versus 24%) and manual removal of the placenta (96% versus 60%). Average score for the five skills was higher for the TRAINED bidan (67%) than the UNTRAINED bidan (40%, P<0.001, see **Table 4**). See **Appendix B, Tables B-2 to B-6** for detailed results of each item on skill checklists.

Passing Score of 70 Percent

A significantly larger percentage of TRAINED versus UNTRAINED bidan had scores of ≥70 percent for the knowledge test (27% and 4% respectively, P=0.03) and skill assessments for manual removal of the placenta (100% and 33% respectively, P<0.001), neonatal resuscitation (39% and 0% respectively, P=0.001), and use of the partograph (61% and 25% respectively, P=0.02, see **Table 5**). None of the UNTRAINED bidan had an average score of ≥70 percent for the five skills, while 46 percent of the TRAINED bidan did (P<0.001).

Complication Audit

Thirty of the 33 TRAINED bidan were able to describe a complicated case (91%). Of these, four described a case with more than one complication (13%). Among the 24 UNTRAINED bidan, 21 were able to describe a complicated case (88%); two of these had more than one complication (10%), see **Table 2**.

Called to Assist TBA

Eighteen of the 33 TRAINED bidan reported that they were asked to assist a TBA either before or after the baby's birth in the complicated case they described (55%) Among the 24 UNTRAINED bidan, 13 reported being called to assist the TBA (54%) In most of the cases, the request to assist the TBA came after the baby was delivered (78% for TRAINED bidan and 100% for UNTRAINED bidan)

Identification of Complications

The types of complications described during the complication audit are consistent with those that cause the most maternal and neonatal deaths (see **Table 2**) The majority of TRAINED and UNTRAINED bidan described a case involving retained placenta (18 and 9 respectively) Newborn asphyxia was the next most common complication described by TRAINED and UNTRAINED bidan (three and four cases respectively)

Table 4
Absolute and Percent Mean Skill Assessment Scores for LSS TRAINED and UNTRAINED Bidan

Skill	Total points	TRAINED N=33	UNTRAINED N=24	P value
Infection prevention	54	34.3 (63%)	26.6 (49%)	0 002
Decontamination	18	9.6 (53%)	6 9 (38%)	<0.001
Cleaning	14	10.1 (72%)	8.2 (58%)	0.03
Steaming	22	14.6 (67%)	11.5 (52%)	0.002
Manual removal of the placenta	62	59.2 (96%)	37.0 (60%)	<0.001
Interpersonal communication	6	6.0 (100%)	5.6 (94%)	0.02
Steps	40	37.7 (94%)	22.5 (57%)	<0.001
Care after	16	15.5 (97%)	8.8 (55%)	<0 001
Bimanual compression	64	32 2 (50%)	13 0 (20%)	<0 001
Interpersonal communication	6	4 4 (73%)	2.0 (33%)	<0.001
Steps before	10	5 1 (51%)	1.9 (19%)	<0.001
External	8	4 6 (58%)	2.6 (32%)	<0.001
Internal	24	12 4 (52%)	4 4 (18%)	<0.001
Care after	16	5 7 (36%)	2 2 (14%)	<0.001
Neonatal resuscitation	42	24 8 (59%)	10 2 (24%)	<0.001
Full	32	21 0 (66%))	9 4 (29%)	<0.01
Breathing only	4	1 8 (45%)	0 5 (13%)	<0 001
Stimulation only	6	2 1 (34%)	0 3 (4%)	<0 001
Partograph	37	25 1 (68%)	17 6 (48%)	0 001
Completion	20	15.7 (78%)	10.7 (54%)	<0.001
Interpretation & Management	17	9 4 (55%)	6 9 (41%)	0 007
Average Score for Five Skills		**67%**	**40%**	**<0.001**

The TRAINED bidan described three cases of postpartum hemorrhage and the UNTRAINED bidan described four cases. The TRAINED bidan identified anemia (hemoglobin ≤8) as a second problem in two of the retained placenta cases and in one case of atony. No cases described by the UNTRAINED bidan included anemia as a complication. More cases with prolonged labor as a complication were described by TRAINED bidan (N=4) than UNTRAINED bidan (N=1).

Table 5
Percentage of LSS TRAINED and UNTRAINED Bidan with Score ≥70 Percent in Knowledge Test and Skill Assessments

	TRAINED N=33	UNTRAINED N=24	P value
Knowledge Test	27%	4%	0.03
Skill Assessments			
Infection prevention	39%	17%	0 12
Manual removal of the placenta	100%	33%	<0.001
Bimanual compression	12%	0%	0 13
Neonatal resuscitation	39%	0%	0.001
Partograph	61%	25%	0.02
Average Score for Five Skills	**46%**	**0%**	**<0.001**

Management and Confidence

In reviewing the management of the cases described, the TRAINED bidan provided more consistent and appropriate management and verbalized a feeling of greater confidence.

Specific examples of differences identified in management between TRAINED and UNTRAINED bidan include:

- Two UNTRAINED bidan used oxytocin before delivery at home. Oxytocin should only be used at a hospital before delivery, under close monitoring and with cesarean section available.
- UNTRAINED bidan were able to successfully perform manual removal to resolve five of the nine cases of retained placenta (56%), while TRAINED bidan were able to manually remove the placenta in 13 of the 18 cases of retained placenta (72%).
- An UNTRAINED bidan referred a woman to the hospital for uterine atony, but she gave no oxytocin to the mother to help the uterus to contract to try to minimize bleeding during transport.

Complications Providers Cared for or Referred in the Last Year

The TRAINED bidan reported 186 complicated cases, while the UNTRAINED bidan reported 59 complicated cases that they had provided care for or referred in the past year. For both groups of bidan, postpartum hemorrhage accounted for 40 to 41 percent of the complications encountered, and newborn asphyxia accounted for 12 percent of the complications. The frequency distribution of cases of prolonged labor, pregnancy-induced hypertension (PIH), and fetal distress differed between the TRAINED bidan (22%, 16%, and 10% respectively) and the UNTRAINED bidan (13%, 36%, and 0% respectively)

Possible explanations for the differences in these three complications include:

- The identification of prolonged labor could be a function of knowing how to correctly identify the complication The use of the partograph, a tool designed to improve the diagnosis of prolonged labor, was introduced and emphasized in the training.

- PIH is a complication that should be referred to a hospital. It is possible that the definitions used to diagnose PIH differed. The LSS training included diagnosing PIH, using confirmed elevated blood pressure readings (rechecking a single elevated reading), proteinuria (using urine acetic method test), and hyperflexia (testing patellar deep tendon reflex) rather than a single elevated blood pressure reading. The more specific criteria for PIH used by the TRAINED bidan would explain the lower frequency.

- The ability to detect fetal distress does increase with increased monitoring. It is possible that UNTRAINED bidan did not detect fetal distress because they did not monitor the fetus closely, while the TRAINED bidan learned and applied more frequent monitoring, per the partograph guidelines.

These data from the complication audit suggest that the LSS training improved the appropriate management of complications and the recognition of more subtle complications, such as anemia, prolonged labor, and fetal distress.

TRAINED BDD (LSS/PR/CE) versus UNTRAINED BDD (No LSS/PR/CE)

Knowledge Test

Overall, the TRAINED BDD scored significantly higher on the knowledge test than the UN-TRAINED BDD with the absolute and percent mean scores of 65 and 59 percent respectively (P=0.006). The statistically significant differences in mean percent scores between the TRAINED and UNTRAINED BDD were centered on infection prevention (86% and 73% respectively), antenatal care (59% and 49% respectively), and family planning (64% and 53% respectively, see **Table 6**).

Table 6
Absolute and Percent Mean Knowledge Scores and Level of Confidence Scores for LSS TRAINED and UNTRAINED Bidan di Desa

	Total points	TRAINED N=33	UNTRAINED N=47	P value
Knowledge Test	48	31 3 (65%)	28 1 (59%)	0 006
Infection prevention	6	5 2 (86%)	4 4 (73%)	0 01
Antenatal care	13	7 6 (59%)	6 3 (49%)	0 003
Intrapartum care	12	7 6 (63%)	7 5 (62%)	0 72
Postpartum care	12	7 8 (65%)	7 3 (60%)	0 21
Family planning	5	3 2 (64%)	2 6 (53%)	0 03
Level of Confidence	100	61 8 (62%)	57 0 (57%)	0 14
Infection prevention	6	3 8 (64%)	3 3 (55%)	0 01
Counseling	12	8 3 (69%)	7 9 (66%)	0 50
Antenatal care	24	15 4 (64%)	14 7 (61%)	0 48
Intrapartum care	24	14 0 (58%)	12 3 (51%)	0 03
Newborn care	12	7 5 (63%)	7 1 (59%)	0 57
Postpartum care	22	12 7 (58%)	11 8 (54%)	0 49

Level of Confidence Scores

No differences in confidence levels were detected between the TRAINED and UN-TRAINED BDD when overall scores in reported confidence in skills were compared (62% and 57% respectively, P=0 14) When mean percent scores for categories of skills were compared, TRAINED BDD were more confident in skills related to infection prevention (64% and 55% respectively) and intrapartum care (58% and 51% respectively, see **Table 6**) See detailed results for individual skills in **Appendix C, Table C-1**

Skill Assessments

The TRAINED BDD scored significantly higher on assessments of all five skills than the UNTRAINED BDD (see **Table 7**). The differences in percent mean scores ranged from ten to 15 percent for infection prevention (79% and 69%), use of the partograph (76% and 66%), and bimanual compression (42% and 27%). The difference in scores ranged from 34 to 35 percent for manual removal of the placenta (93% and 59%) and neonatal resuscitation (67% and 32%). The average score for the five skills was significantly higher for the TRAINED BDD than for the UNTRAINED BDD (71% and 51% respectively, P<0.001). See **Appendix C, Tables C-2 to C-6** for detailed results of each item in skill checklists.

Table 7
Absolute and Percent Mean Skill Assessment Scores for LSS TRAINED and UNTRAINED Bidan di Desa

Skill	Total points	TRAINED N=33	UNTRAINED N=47	P value
Infection prevention	54	42.7 (79%)	37.6 (69%)	0.01
Decontamination	18	12.4 (69%)	11.2 (62%)	0.18
Cleaning	14	12.6 (90%)	10.4 (74%)	<0.001
Steaming	22	17.7 (81%)	15.9 (72%)	0.04
Manual removal of placenta	62	57.6 (93%)	36.3 (59%)	<0.001
Interpersonal communication	6	6.0 (99%)	5.2 (87%)	<0.001
Steps	40	36 4 (91%)	21.3 (53%)	<0 001
Care after	16	15.2 (95%)	9.9 (62%)	<0.001
Bimanual compression	64	26.6 (42%)	17.3 (27%)	<0.001
Interpersonal communication	6	3.1 (52%)	2.5 (42%)	0.02
Steps before	10	3 6 (36%)	1 8 (18%)	<0.001
External	8	4.1 (51%)	3.4 (43%)	0 003
Internal	24	11 2 (47%)	7.3 (30%)	<0.001
Care after	16	4.7 (29%)	2 3 (15%)	<0.001
Neonatal resuscitation	42	28 4 (67%)	13.4 (32%)	<0.001
Full	32	24.9 (78%)	12.6 (39%)	<0 001
Breathing only	4	2.2 (54%)	0.7 (19%)	<0 001
Stimulation only	6	1 3 (22%)	0 1 (2%)	<0.001
Partograph	37	28 2 (76%)	24 6 (66%)	0.03
Completion	20	18 5 (92%)	15.5 (78%)	0 002
Interpretation & Management	17	9 7 (57%)	9.1 (53%)	0 25
Average Score for Five Skills		**71%**	**51%**	**<0.001**

Passing Score of 70 Percent

A significantly larger percentage of TRAINED versus UNTRAINED BDD had scores of ≥70 percent for the knowledge test (36% and 9% respectively, P=0.005) and for the skills of manual removal of the placenta (94% and 36% respectively, P<0.001), neonatal resuscitation (61% and 4% respectively, P<0.001), and use of the partograph (82% and 57% respectively, P=0.04, see **Table 8**) Only six percent of the UNTRAINED BDD had an average score of ≥70 percent for the five skills, while 67 percent of the TRAINED BDD did (P<0.001)

Complication Audit

Thirty of the 33 TRAINED BDD were able to describe a complicated case (91%). Of these, eight described a case with more than one complication (27%). Among the 47 UNTRAINED BDD, 44 were able to describe a complicated case (94%); 12 of these had more than one complication (27%), see **Table 2**.

Called to Assist TBA

Fourteen of the 33 TRAINED BDD reported that they were asked to assist a TBA either before or after the baby's birth in the complicated case they described (42%). Among the 47 UNTRAINED BDD, 25 reported being called to assist the TBA (53%). In most of the cases, the request to assist the TBA came after the baby was delivered (71% for TRAINED and 60% for the UNTRAINED BDD).

Table 8
Percentage of LSS TRAINED and UNTRAINED Bidan di Desa with Score ≥70 Percent in Knowledge Test and Skill Assessments

	TRAINED N=33	UNTRAINED N=24	P value
Knowledge Test	36%	9%	0 005
Skill Assessments			
Infection prevention	85%	62%	0.05
Manual removal of the placenta	94%	36%	<0 001
Bimanual compression	9%	2%	0 30
Neonatal resuscitation	61%	4%	<0 001
Partograph	82%	57%	0 04
Average Score for Five Skills	67%	6%	**<0.001**

Identification of Complications

The types of complications described during the complication audit are similar to those described by the bidan. The majority of TRAINED and UNTRAINED BDD described a case involving retained placenta (15 cases each). Newborn asphyxia was the next most common complication described by TRAINED (five cases) and UNTRAINED (ten cases) BDD. Other complications included by the TRAINED and UNTRAINED BDD were postpartum hemorrhage (five cases each) and prolonged labor (two and seven cases respectively) Both the TRAINED and UNTRAINED BDD reported cases with anemia (three and five cases respectively) with all but one of the cases (reported by UNTRAINED BDD) associated with uterine atony or retained placenta.

Management and Confidence

In reviewing the management of the cases described, the TRAINED BDD provided more consistent and appropriate management than UNTRAINED BDD, and the TRAINED BDD verbalized a feeling of greater confidence.

Specific examples of differences identified in management between TRAINED and UNTRAINED BDD include

- Three UNTRAINED BDD used oxytocin before delivery at home, one with a mother with PIH. Oxytocin should only be used at a hospital before delivery, under close monitoring and with cesarean section available

- UNTRAINED BDD often kept mothers at home longer before referral:

  — A mother made only 1-cm progress (5 to 6 cm) in six hours, and she still was not referred for prolonged labor The partograph was not used by UNTRAINED BDD, contributing to late recognition and referral of prolonged labor.

  — A woman at 36 weeks gestation with hemoglobin of 4 gm and antenatal bleeding (placenta previa) saw an UNTRAINED BDD The BDD did not refer the mother directly to the hospital but had her rest for several days. It was not until the bleeding reoccurred that the BDD referred the mother to the hospital. This could have had a disastrous outcome for both the mother and baby The mother should have been referred immediately

- UNTRAINED BDD managed cases at home that should have been managed in a hospital (e.g., 36-week gestation with twin pregnancy and PIH in which both twins died).

- TRAINED BDD were able to successfully do manual removal of the placenta more frequently than UNTRAINED BDD.

Complications Providers Cared for or Referred in the Last Year

The TRAINED BDD reported 65 cases and the UNTRAINED BDD reported 71 cases that they provided care for or referred in the last year. There was less variation in the frequency distribution of the types of complications among these two groups of BDD than among the TRAINED and UNTRAINED bidan. Postpartum hemorrhage accounted for 37 and 34 percent of the complications reported by the TRAINED and UNTRAINED BDD respectively; newborn asphyxia accounted for 22 and 25 percent; prolonged labor 17 and 21 percent; PIH 15 and 13 percent; and fetal distress nine and seven percent.

These data from the complication audit suggest that LSS training improved the appropriate management of complications.

TRAINED Bidan (LSS/PR/CE) versus CLINICAL INSTRUCTOR Bidan (LSS/Site Prep)

Knowledge Test

The overall knowledge test mean scores did not differ when the TRAINED bidan were compared with the CLINICAL INSTRUCTORS (63% and 61% respectively, P=0.46) Significantly higher mean scores for antenatal care were seen among the TRAINED bidan versus the CLINICAL INSTRUCTORS (61% and 47% respectively, P<0.001, see **Table 9**)

Level of Confidence Scores

The TRAINED bidan were significantly more confident than the CLINICAL INSTRUCTORS when overall scores in reported confidence in skills were compared (59% and 53% respectively, P=0 03) When categories of skills were compared, TRAINED bidan were more confident in counseling and postpartum skills than CLINICAL INSTRUCTORS (see **Table 9**) See detailed results for individual skills in **Appendix B, Table B-1**

Table 9
Absolute and Percent Mean Knowledge and Level of Confidence Scores for LSS TRAINED and CLINICAL INSTRUCTOR Bidan

	Total points	TRAINED N=33	CLINICAL INSTRUCTOR N=23	P value
Knowledge test	48	30 2 (63%)	29 1 (61%)	0 46
Infection prevention	6	4 4 (73%)	4 7 (78%)	0 55
Antenatal care	13	7 9 (61%)	6 1 (47%)	<0 001
Intrapartum care	12	8 2 (68%)	8 1 (67%)	0 95
Postpartum care	12	7 0 (59%)	8 0 (66%)	0 19
Family planning	5	2 7 (55%)	2 3 (46%)	0 11
Level of confidence	106	63 1 (59%)	56 6 (53%)	0 03
Infection prevention	6	4 0 (66%)	3 6 (60%)	0 15
Counseling	12	7 8 (65%)	6 6 (55%)	0 02
Antenatal care	24	15 2 (63%)	14 3 (60%)	0 36
Intrapartum care	30	16 8 (56%)	16 4 (55%)	0 18
Newborn care	12	7 5 (62%)	6 7 (55%)	0 13
Postpartum care	22	11 8 (54%)	9 0 (41%)	0 002

Skill Assessments

There was no difference in the average score for the five skills for the TRAINED bidan and CLINICAL INSTRUCTORS (67% and 68% respectively, P=0.75). The TRAINED bidan scored higher, approaching statistical significance, in manual removal of the placenta (96% and 87% respectively, P=0.07) and bimanual compression (50% and 43% respectively, P=0.07). The CLINICAL INSTRUCTORS scored significantly higher than TRAINED bidan in infection prevention (72% and 63% respectively, P=0.03), approaching statistical significance in use of the partograph (75% and 68%, P=0.09) and slightly higher, but with no statistical difference, in neonatal resuscitation (63% and 59%, P=0.37; see **Table 10**). See **Appendix B, Tables B-2 to B-6** for detailed results of each item in skill checklists.

Table 10
Absolute and Percent Mean Skill Assessment Scores for LSS TRAINED and CLINICAL INSTRUCTOR Bidan

Skill	Total points	TRAINED N=33	CLINICAL INSTRUCTOR N=23	P value
Infection prevention	54	34.3 (63%)	38.8 (72%)	0.03
Decontamination	18	9.6 (53%)	11.4 (64%)	0.03
Cleaning	14	10.1 (72%)	12.0 (86%)	<0.001
Steaming	22	14.6 (67%)	15.4 (70%)	0 39
Manual removal of the placenta	62	59.2 (96%)	53.7 (87%)	0.07
Interpersonal communication	6	6.0 (100%)	6.0 (100%)	1.00
Steps	40	37.7 (94%)	34.0 (85%)	0.14
Care after	16	15.5 (97%)	13.7 (86%)	0.005
Bimanual compression	64	32.2 (50%)	27.8 (43%)	0.07
Interpersonal communication	6	4.4 (73%)	4.2 (70%)	0 70
Steps before	10	5.1 (51%)	2 7 (27%)	<0.001
External	8	4.6 (58%)	4.0 (50%)	0.51
Internal	24	12 4 (52%)	12.1 (51%)	0.87
Care after	16	5 7 (36%)	4 7 (30%)	0.12
Neonatal resuscitation	42	24.8 (59%)	26.5 (63%)	0 37
Full	32	21 0 (66%)	23 0 (72%)	0.20
Breathing only	4	1 8 (45%)	1 9 (48%)	0 71
Stimulation only	6	2 1 (34%)	1 6 (26%)	0.16
Partograph	37	25 1 (68%)	27 7 (75%)	0 09
Completion	20	15 7 (78%)	16 9 (85%)	0.36
Interpretation & Management	17	9.4 (55%)	10 7 (63%)	0.15
Average Score for Five Skills		**67%**	**68%**	**0.75**

Passing Score of 70 Percent

The only skill in which more TRAINED than CLINICAL INSTRUCTOR bidan significantly achieved a score of ≥70 percent was manual removal of the placenta (100% and 83% respectively). No statistically significant differences were detected in the knowledge test or the other four skills (see **Table 11**). Almost half of the TRAINED bidan and CLINICAL INSTRUCTOR bidan had an average score for the five skills of ≥70 percent.

Complication Audit

As previously reported, 30 of the 33 TRAINED bidan were able to describe a complicated case (91%) Of these, four described a case with more than one complication (13%) Among the 23 CLINICAL INSTRUCTOR bidan, 20 were able to describe a complicated case (87%), eight of these had more than one complication (40%) (see **Table 2**)

Called to Assist TBA

Eighteen of the 33 TRAINED bidan reported that they were asked to assist a TBA either before or after the baby's birth in the complicated case they described (55%) Among the 23 CLINICAL INSTRUCTOR bidan, four reported being called to assist the TBA (17%) This difference is most likely due to the fact that most of the CLINICAL INSTRUCTOR bidan were posted to a hospital and the TRAINED bidan were posted to health centers In most of the cases, the request to

assist the TBA came after the baby was delivered (78% for TRAINED bidan and 75% for the CLINICAL INSTRUCTOR bidan).

Table 11
Percentage of LSS TRAINED and CLINICAL INSTRUCTOR Bidan with Score ≥70 Percent in Knowledge Test and Skill Assessments

	TRAINED N=33	CLINICAL INSTRUCTOR N=23	P value
Knowledge Test	27%	26%	0 84
Skill Assessments			
Infection prevention	39%	52%	0 50
Manual removal of the placenta	100%	83%	0 02
Bimanual compression	12%	4%	0 64
Neonatal resuscitation	39%	48%	0.72
Partograph	61%	78%	0.27
Average Score for Five Skills	**46%**	**48%**	**0.92**

Identification of Complications

The types of complications described during the complication audit are consistent with those reported previously (see **Table 2**). The majority of TRAINED and CLINICAL INSTRUCTOR bidan described a case involving retained placenta (18 and 9 cases respectively). Newborn asphyxia was also reported in four cases by the TRAINED bidan and in three cases by the CLINICAL INSTRUCTOR bidan. The TRAINED bidan described three cases of postpartum hemorrhage while the CLINICAL INSTRUCTORS described one case. Both the TRAINED and CLINICAL INSTRUCTOR bidan identified anemia (hemoglobin ≤8) as a second problem in eight cases of retained placenta and uterine atony. Cases with prolonged labor as a complication were also described by the TRAINED bidan (N=4) and the CLINICAL INSTRUCTOR bidan (N=5).

Management and Confidence

In reviewing the management of the cases described, little difference in management is seen between TRAINED bidan and CLINICAL INSTRUCTORS. Both groups seem to verbalize an equal feeling of confidence.

Complications Providers Cared for or Referred in the Last Year

The TRAINED bidan reported 186 complicated cases and the CLINICAL INSTRUCTOR bidan reported over 2000 complicated cases that they cared for or referred in the last year. The higher number of complications reflects the difference in workplace with most of the CLINICAL INSTRUCTORS working in hospitals with larger numbers of patients and the TRAINED bidan working closer to the community in health centers.

For both groups of bidan, postpartum hemorrhage accounted for 30 to 40 percent of the complications encountered, and newborn asphyxia accounted for 12 percent. The frequency distribution of cases of prolonged labor, pregnancy-induced hypertension (PIH), and fetal distress differed somewhat between the TRAINED bidan (22%, 16%, and 10% respectively) and the CLINICAL INSTRUCTOR bidan (28%, 11%, and 19% respectively).

These data from the complication audit suggest that that LSS training improved the appropriate management of complications and the recognition of more subtle complications, such as anemia, prolonged labor, and fetal distress for both groups of bidan.

CLINICAL INSTRUCTORS (LSS/Site Prep) versus UNTRAINED Bidan (no LSS/PR/CE)

Knowledge Test

Overall, the CLINICAL INSTRUCTORS scored significantly higher than the UNTRAINED bidan with the absolute and percent mean scores of 61 and 48 percent respectively (P=0.001). These differences were consistent when categories of questions included in the knowledge test were compared (see **Table 12**).

Level of Confidence Scores

The reported overall level of confidence approached statistical significance when CLINICAL INSTRUCTORS (53%) were compared to UNTRAINED bidan (47%, P=0.09). The CLINICAL INSTRUCTORS were more confident than the UNTRAINED bidan in skills related to infection prevention (60% and 51% respectively, P=0.03) and intrapartum care (55% and 40% respectively, P=0 007, see **Table 12**). See detailed results for individual skills in **Appendix B, Table B-1.**

Skill Assessments

The CLINICAL INSTRUCTORS scored significantly higher on assessments of all five skills than the UNTRAINED bidan. The differences in percent mean scores ranged from 23 to 27 percent for infection prevention (72% and 49%), bimanual compression (43% and 20%), manual removal of the placenta (87% and 60%), and use of the partograph (75% and 48%) A 39 percent difference was shown for neonatal resuscitation (63% and 24%) The average score for the five skills was 68 percent for the CLINICAL INSTRUCTORS and 40 percent for the UNTRAINED bidan (P<0 001, see **Table 13**) See **Appendix B, Tables B-2 to B-6** for detailed results of each item in skill checklists

Table 12
Absolute and Percent Mean Knowledge and Level of Confidence Scores for CLINICAL INSTRUCTOR and UNTRAINED Bidan

	Total points	CLINICAL INSTRUCTOR N=23	UNTRAINED N=24	P value
Knowledge test	48	29 1 (61%)	23 2 (48%)	0 001
Infection prevention	6	4 7 (78%)	3 2 (53%)	003
Antenatal care	13	6 1 (47%)	5 0 (38%)	0 03
Intrapartum care	12	8 1 (67%)	6 5 (55%)	0 01
Postpartum care	12	8 0 (66%)	6 5 (54%)	0 03
Family planning	5	2 3 (46%)	2 0 (40%)	0 24
Level of confidence	106	56 6 (53%)	49 8 (47%)	0 09
Infection prevention	6	3 6 (60%)	3 0 (51%)	0 03
Counseling	12	6 6 (55%)	7 4 (62%)	0 12
Antenatal care	24	14 3 (60%)	12 5 (52%)	0 24
Intrapartum care	30	16 4 (55%)	12 0 (40%))	0 007
Newborn care	12	6 7 (55%)	5 5 (46%)	0 18
Postpartum care	22	9 0 (41%)	9 3 (42%)	0 67

Passing Score of 70 Percent

Significantly more of the CLINICAL INSTRUCTOR bidan than the UNTRAINED bidan achieved a score of ≥70 percent in all skills except bimanual compression (see **Table 14**). 48 percent of the CLINICAL INSTRUCTOR bidan had an average score of ≥70 percent for the five skills while none of the UNTRAINED bidan did (P<0.001).

Table 13
Absolute and Percent Mean Skill Assessment Scores for LSS CLINICAL INSTRUCTORS and UNTRAINED Bidan

Skill	Total points	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
Infection prevention	54	38.8 (72%)	26.6 (49%)	<0.001
Decontamination	18	11.4 (64%)	6.9 (38%)	<0.001
Cleaning	14	12.0 (86%)	8.2 (58%)	<0.001
Steaming	22	15.4 (70%)	11.5 (52%)	<0.001
Manual removal of the placenta	62	53.7 (87%)	37.0 (60%)	<0.001
Interpersonal communication	6	6.0 (100%)	5.6 (94%)	0.04
Steps	40	34.0 (85%)	22.5 (57%)	<0.001
Care after	16	13.7 (86%)	8.8 (55%)	<0.001
Bimanual compression	64	27.8 (43%)	13.0 (20%)	<0.001
Interpersonal communication	6	4.2 (70%)	2.0 (33%)	<0.001
Steps before	10	2.7 (27%)	1.9 (19%)	0.16
External	8	4.0 (50%)	2.6 (32%)	0.01
Internal	24	12.1 (51%)	4.4 (18%)	<0.001
Care after	16	4.7 (30%)	2.2 (14%)	0.002
Neonatal resuscitation	42	26.5 (63%)	10.2 (24%)	<0.001
Full	32	23.0 (72%)	9.4 (29%)	<0.001
Breathing only	4	1.9 (48%)	0.5 (13%)	<0.001
Stimulation only	6	1.6 (26%)	0.3 (4%)	<0.001
Partograph	37	27.7 (75%)	17.6 (48%)	<0.001
Completion	20	16.9 (85%)	10.7 (54%)	<0.001
Interpretation & Management	17	10.7 (63%)	6.9 (41%)	<0.001
Average Score for Five Skills		**68%**	**40%**	**<0.001**

Complication Audit

As previously reported, among the 23 CLINICAL INSTRUCTOR bidan, 20 were able to describe a complicated case (87%); eight of these had more than one complication (40%). Among the 24 UNTRAINED bidan, 21 were able to describe a complicated case (88%); two of these had more than one complication (9%) (see **Table 2**).

Called to Assist TBA

Among the 23 CLINICAL INSTRUCTOR bidan, four reported being called to assist the TBA (17%). Among the 24 UNTRAINED bidan, 13 reported being called to assist the TBA (54%). This difference is most likely due to the fact that most of the CLINICAL INSTRUCTOR bidan were posted to hospital and the UNTRAINED bidan were posted to health centers. In most of the cases, the request to assist the TBA came after the baby was delivered (75% for the CLINICAL INSTRUCTOR bidan and 100% for the UNTRAINED bidan)

Identification of Complications

The types of complications described during the complication audit are consistent with those that cause the most maternal and neonatal deaths (see **Table 2**) The majority of CLINICAL INSTRUCTOR and UNTRAINED bidan described a case involving retained placenta (9 cases each). Newborn asphyxia was described as a complication by CLINICAL INSTRUCTOR and UNTRAINED bidan in three cases for each group The CLINICAL INSTRUCTOR and UNTRAINED bidan each described three

cases of postpartum hemorrhage. All five of the cases identified with anemia (hemoglobin ≤8) as a second problem by the CLINICAL INSTRUCTOR bidan included cases in which retained placenta or atony also occurred. No cases described by the UNTRAINED bidan included anemia as a complication. Cases with prolonged labor as a complication were also more likely to be described by the CLINICAL INSTRUCTOR bidan (N=5) than UNTRAINED bidan (N=1).

Table 14
Percentage of CLINICAL INSTRUCTOR and UNTRAINED Bidan with Score ≥70 Percent in Knowledge Test and Skill Assessments

	CLINICAL INSTRUCTOR N=23	UNTRAINED N=24	P value
Knowledge Test	26%	4%	0 05
Skill Assessments			
Infection prevention	52%	17%	0 02
Manual removal of the placenta	83%	33%	0 002
Bimanual compression	4%	0%	0 49
Neonatal resuscitation	48%	0%	<0 001
Partograph	78%	25%	<0 001
Average Score for Five Skills	**48%**	**0%**	**<0.001**

Management and Confidence

In reviewing the management of the cases described, the CLINICAL INSTRUCTORS provided more consistent and appropriate management and verbalized a feeling of greater confidence in their knowledge and skills than the UNTRAINED bidan. See the previous sections for the descriptions of the management of the CLINICAL INSTRUCTORS and the UNTRAINED bidan.

Complications Providers Cared for or Referred in the Last Year

The large number of complications for CLINICAL INSTRUCTORS (see previous section comparing CLINICAL INSTRUCTORS and TRAINED bidan) reflects their work site. They are located in district level referral hospitals, while the UNTRAINED bidan are closer to the community in health centers.

Again, these data from the complication audit suggest that LSS training improved the appropriate management of complications and the recognition of more subtle complications, such as anemia, prolonged labor, and fetal distress.

Objective 2:
Compare the ability of the Internship and MotherCare (LSS & PR/CE) Programs to increase the knowledge, confidence, and skills of BDD in providing quality maternal and newborn care

TRAINED BDD versus INTERN BDD

Knowledge Test

The overall knowledge test mean score and most of the mean scores for the various content areas did not differ when the TRAINED BDD were compared to the INTERNS (P=0.15, see **Table 15**). The score in family planning was higher for the TRAINED than the INTERN BDD (64% and 51% respectively, P=0.01).

Table 15
Absolute and Percent Mean Knowledge and Level of Confidence Scores for LSS TRAINED and INTERN Bidan di Desa

	Total points	TRAINED N=33	INTERN N=28	P value
Knowledge test	48	31.3 (65%)	29.9 (62%)	0.24
Infection prevention	6	5.2 (86%)	4.8 (79%)	0.37
Antenatal care	13	7.6 (59%)	6.8 (52%)	0.15
Intrapartum care	12	7.6 (63%)	8.1 (68%)	0.34
Postpartum care	12	7.8 (65%)	7.6 (64%)	0.50
Family planning	5	3.2 (64%)	2.6 (51%)	0.01
Level of confidence	100	61.8 (62%)	65.0 (65%)	0.51
Infection prevention	6	3.8 (64%)	4.2 (70%)	0.38
Counseling	12	8.3 (69%)	9.4 (78%)	0.07
Antenatal care	24	15.4 (64%)	16 5 (69%)	0.55
Intrapartum care	24	14.0 (58%)	13 6 (57%)	0 45
Newborn care	12	7.5 (63%)	8.3 (69%)	0.32
Postpartum care	22	12 7 (58%)	13 1 (60%)	0.77

Level of Confidence Scores

The confidence level of the TRAINED BDD was comparable to that of the INTERNS when overall scores of reported confidence in skills were compared (62% and 65% respectively, P=0.51, see **Table 15**) See detailed results for individual skills in **Appendix C, Table C-1**.

Skill Assessments

The TRAINED BDD had statistically higher scores than the INTERNS in the skill assessments for manual removal of the placenta (93% and 74% respectively, P<0 001), bimanual compression (42% and 35% respectively, P=0 009), and neonatal resuscitation (67% and 53% respectively, P=0 001) The TRAINED BDD had borderline significantly higher scores in infection prevention (79% and 74% respectively, P=0 10), but there was no difference in scores for use of the partograph (76% each, P=0 50, see **Table 16**) The average score for the five skills for the TRAINED BDD was higher than that of the INTERNS (71% and 62% respectively, P<0.001). See **Appendix C, Tables C-2 to C-6** for detailed results of each item on skill checklists.

Passing Score of 70 Percent

No differences were detected between the TRAINED and INTERN BDD for achieving a score of ≥70 percent on the knowledge test (36% and 25% respectively, P=0.32) nor for infection prevention (85% and 68% respectively, P=0.21), bimanual compression (9% and 0% respectively, P=0.24), and use of the partograph (82% and 71% respectively, P=0.51, see **Table 17**). Significantly more of the TRAINED BDD than INTERNS achieved a score of ≥70 percent in the average score for the five skills (67% and 25% respectively) and in the assessment of skills related to manual removal of the placenta, and neonatal resuscitation (94% and 61% respectively) (61% and 21% respectively).

Table 16
Absolute and Percent Mean Skill Assessment Scores for LSS TRAINED and INTERN Bidan di Desa

Skill	Total points	TRAINED N=33	INTERN N=28	P value
Infection prevention	54	42 7 (79%)	40 (74%)	0.10
Decontamination	18	12 4 (69%)	11 8 (66%)	0 43
Cleaning	14	12.6 (90%)	11 9 (85%)	0.22
Steaming	22	17 7 (81%)	16 4 (75%)	0 12
Manual removal of the placenta	62	57 6 (93%)	45 7 (74%)	<0.001
Interpersonal communication	6	6 0 (99%)	5 4 (90%)	0 002
Steps	40	36 4 (91%)	28.5 (72%)	0 002
Care after	16	15 2 (95%)	11 8 (74%)	<0 001
Bimanual compression	64	26 6 (42%)	22 6 (35%)	0 009
Interpersonal communication	6	3 1 (52%)	2 5 (42%)	0 02
Steps before	10	3 6 (36%)	2 9 (29%)	0 11
External	8	4 1 (51%)	3 8 (47%)	0 04
Internal	24	11 2 (47%)	9 7 (40%)	0 09
Care after	16	4 7 (29%)	3 8 (24%)	0 11
Neonatal resuscitation	42	28 4 (67%)	22 3 (53%)	0 001
Full	32	24 9 (78%)	20 4 (64%)	0 002
Breathing only	4	2 2 (54%)	1 5 (38%)	0 003
Stimulation only	6	1 3 (22%)	0 4 (7%)	<0 001
Partograph	37	28 2 (76%)	28 0 (76%)	0 50
Completion	20	18 5 (92%)	17 5 (88%)	0 15
Interpretation & Management	17	9 7 (57%)	10 5 (62%)	0 73
Average Score for Five Skills		**71%**	**62%**	**<0.001**

Complication Audit

Thirty of the 33 TRAINED BDD were able to describe a complicated case (91%). Of these, eight described a case with more than one complication (27%). Among the 28 INTERN BDD, 27 were able to describe a complicated case (96%); one of these had more than one complication (4%), see **Table 2**.

Called to Assist TBA

Fourteen of the 33 TRAINED BDD reported that they were asked to assist a TBA either before or after the baby's birth in the complicated case they described (42%) Among the 28 INTERN BDD, 14 reported being called to assist the TBA (50%) In most of the cases, the request to assist the TBA came after the baby was delivered (71% for the TRAINED BDD and 57% for the INTERNS)

Identification of Complications

The types of complications described during the complication audit are similar as those described previously (see **Table 2**) The most common complication described by the TRAINED BDD was retained placenta (15 cases) followed by newborn asphyxia (five cases) The INTERN BDD reported newborn asphyxia more times (ten cases) than retained placenta (eight cases) Other complications included postpartum hemorrhage (five cases by TRAINED BDD and three cases by IN-

TERN BDD) and prolonged labor (two and three cases respectively). The TRAINED BDD reported three cases of anemia with all but one of the cases associated with uterine atony or retained placenta. The INTERN BDD did not report any cases complicated by anemia.

Management and Confidence

In reviewing the management of the cases described, little difference is found between how TRAINED BDD and BDD INTERNS managed complications. In the cases described, they equally applied the protocols and skills taught in the programs.

Table 17
Percentage of LSS TRAINED & INTERN BDD with Score ≥70 Percent in Knowledge Test and Skill Assessments

	TRAINED N=33	INTERN N=28	P value
Knowledge Test	36%	25%	0.50
Skill Assessments			
Infection prevention	85%	68%	0.21
Manual removal of the placenta	94%	61%	0.004
Bimanual compression	9%	0%	0.24
Neonatal resuscitation	61%	21%	0.005
Partograph	82%	71%	0.51
Average Score for Five Skills	**67%**	**25%**	**0.003**

Complications Providers Cared for or Referred in the Last Year

The TRAINED BDD reported 65 complicated cases and the INTERN BDD reported 229 complicated cases that they cared for or referred in the last year. The reason for the greater number by the TRAINED is unknown. The frequency distribution of the types of complications between TRAINED and INTERN BDD varied with postpartum hemorrhage accounting for 37 and 30 percent, newborn asphyxia accounting for 22 and 17 percent, prolonged labor accounting for 17 and 26 percent, PIH accounting for 15 and three percent, and fetal distress accounting for nine and 24 percent, respectively.

Again, these data from the complication audit suggest that the LSS training improved the appropriate management of complications for both groups of BDD.

INTERN BDD versus UNTRAINED BDD

Knowledge Test

Overall, the INTERN BDD did not score higher than the UNTRAINED BDD with the absolute and percent mean scores of 62 and 59 percent respectively (P=0.12, see **Table 18**).

Level of Confidence Scores

The INTERN BDD were no more confident than the UNTRAINED BDD (P=0.12) when overall scores were compared, 65 and 57 percent respectively (see **Table 18**). Significantly higher confidence levels by the INTERN BDD were noted for infection prevention and counseling. See detailed results for individual skills in **Appendix C, Table C-1**.

Skill Assessments

The INTERN BDD scored significantly higher than the UNTRAINED BDD on average for the five skills (62% and 51% respectively, P<0.001) and in the assessment of manual removal of the placenta (74% and 59% respectively, P=0.005), bimanual compression (35% and 27% respectively, P=0.002), and neonatal resuscitation (53% and 32% respectively, P<0.001, see **Table 19**). No difference was found in skills related to infection prevention (74% and 69% respectively, P=0.34) and use of the partograph (76% and 66% respectively, P=0.12). See **Appendix C, Tables C-2 to C-6** for detailed results of each item in skill checklists.

Table 18
Absolute and Percent Mean Knowledge and Level of Confidence Scores for INTERN and UNTRAINED Bidan di Desa

	Total points	INTERN N=28	UNTRAINED N=47	P value
Knowledge test	48	29.9 (62%)	28.1 (59%)	0.12
Infection prevention	6	4.8 (79%)	4.4 (73%)	0.22
Antenatal care	13	6.8 (52%)	6.3 (49%)	0.26
Intrapartum care	12	8 1 (68%)	7.5 (62%)	0.18
Postpartum care	12	7.6 (64%)	7.3 (60%)	0.56
Family planning	5	2.6 (51%)	2.6 (53%)	0.73
Level of confidence	100	65.0 (65%)	57.0 (57%)	0.12
Infection prevention	6	4.2 (70%)	3.3 (55%)	0.004
Counseling	12	9.4 (78%)	7.9 (66%)	0.02
Antenatal care	24	16.5 (69%)	14.7 (61%)	0.24
Intrapartum care	24	13.6 (57%)	12.3 (51%)	0 25
Newborn care	12	8 3 (69%)	7 1 (59%)	0 07
Postpartum care	22	13.1 (60%)	11.8 (54%)	0.28

Passing Score of 70 Percent

Borderline significantly more of the INTERN BDD achieved a score of ≥70 percent on the knowledge test (25% and 9% respectively, P=0.09) and in the assessment of skills related to manual removal of the placenta (61% and 36% respectively, P=0 07) and neonatal resuscitation (21% and 4% respectively, P=0.05, see **Table 20**) However, more of the INTERNS than the UNTRAINED BDD achieved a score ≥70 percent when the average score for the five skills was calculated (25% and 6% respectively, P=0.03).

Complication Audit

Among the 28 INTERN BDD, 27 were able to describe a complicated case (96%); one of these had more than one complication (4%) Among the 47 UNTRAINED BDD, 44 were able to describe a complicated case (94%), twelve of these had more than one complication (28%) (see **Table 2**).

Called to Assist TBA

Among the 28 INTERN BDD, 14 reported being called to assist the TBA (50%), and 25 of the 47 UNTRAINED BDD were called (53%) In most of the cases, the request to assist the TBA came after the baby was delivered (57% for the INTERN BDD and 60% for the UNTRAINED BDD).

Identification of Complications

Many of INTERN and UNTRAINED BDD described a case involving retained placenta (8 and 15 cases respectively, see **Table 2**). Newborn asphyxia was also common, with ten cases described by both groups. Other complications described in cases by the INTERN and UNTRAINED BDD were postpartum hemorrhage (three and five cases respectively) and prolonged labor (three and seven cases respectively). None of the cases reported by the INTERN BDD included anemia as a complication, while the UNTRAINED BDD included this as a second complication in five cases, with four cases also complicated by uterine atony or retained placenta.

Management and Confidence

In summary, major differences in management and skill between INTERN and UNTRAINED BDD are described in the cases. As with the TRAINED BDD, INTERN BDD consistently describe success in applying manual removal of the placenta, use of the partograph, infant resuscitation, and bimanual compression On the other hand, the UNTRAINED BDD have less success with manual removal of the placenta, do not use the partograph or bimanual compression of the uterus, and use ineffective and sometimes unsafe methods for infant resuscitation.

Table 20
Percentage of INTERN and UNTRAINED BDD with Score of ≥70 Percent in Knowledge Test and Skill Assessments

	INTERN N=28	UNTRAINED N=47	P value
Knowledge Test	25%	9%	0 09
Skill Assessments			
Infection prevention	68%	62%	0 77
Manual removal of the placenta	61%	36%	0 07
Bimanual compression	0%	2%	1 00
Neonatal resuscitation	21%	4%	0 05
Partograph	71%	57%	0 34
Average Score for Five Skills	**25%**	**6%**	**0.03**

Table 19
Absolute and Percent Mean Skill Assessment Scores for LSS INTERN and UNTRAINED Bidan di Desa

Skill	Total points	INTERN N=28	UNTRAINED N=47	P value
Infection prevention	54	4.01 (74%)	37.6 (69%)	0.34
Decontamination	18	11.8 (66%)	11.2 (62%)	0.50
Cleaning	14	11.9 (85%)	10.4 (74%)	0.02
Steaming	22	16.4 (75%)	15.9 (72%)	0.70
Manual removal of the placenta	62	45.7 (74%)	36.3 (59%)	0.005
Interpersonal communication	6	5.4 (90%)	5.2 (87%)	0.18
Steps	40	28.5 (72%)	21.3 (53%)	0.003
Care after	16	11.8 (74%)	9.9 (62%)	0.04
Bimanual compression	64	22.6 (35%)	17.3 (27%)	0.002
Interpersonal communication	6	2.5 (42%)	2.5 (42%)	0.94
Steps before	10	2.9 (29%)	1.8 (18%)	0.04
External	8	3.8 (47%)	3.4 (43%)	0.17
Internal	24	9.7 (40%)	7.3 (30%)	<0.001
Care after	16	3.8 (24%)	2.3 (15%)	0.03
Neonatal resuscitation	42	22 3 (53%)	13.4 (32%)	<0.001
Full	32	20 4 (64%)	12.6 (39%)	<0.001
Breathing only	4	1.5 (38%)	0.7 (19%)	0.002
Stimulation only	6	0.4 (7%)	0.1 (2%)	0.01
Partograph	37	28.0 (76%)	24.6 (66%)	0 12
Completion	20	17.5 (88%)	15.5 (78%)	0.10
Interpretation & Management	17	10.5 (62%)	9 1 (53%)	0.13
Average Score for Five Skills		**62%**	**51%**	**<0.001**

Complications Providers Cared for or Referred in the Last Year

The INTERNS reported 229 cases and the UNTRAINED bidan reported 71 cases that they had provided care for or referred in the last year. The frequency distribution of the types of complications between the INTERNS and UNTRAINED BDD varied with postpartum hemorrhage (30% and 34%), newborn asphyxia (17%

and 25%), prolonged labor (27% and 21%), PIH (3% and 13%), and fetal distress (24% and 7%), respectively.

Again, these data from the complication audit suggest that the Internship Program improved the appropriate management of complications.

Table 21
Comments by TRAINED Bidan, CLINICAL INSTRUCTOR Bidan, TRAINED BDD, and INTERN BDD on How Training Helped in Their Management of Complicated Cases

	Bidan		Bidan di Desa		
	TRAINED	CLINICAL INSTRUCTOR	TRAINED	INTERN	TOTAL
Trained to do/more confident in doing manual removal of the placenta	13	6	12	4	**35**
Can now do effective infant resuscitation (before used only alcohol or cold water to stimulate baby)	4	6	9	10	**29**
More knowledgeable in infection prevention and how to prevent HIV and Hepatitus	1	8	8	7	**24**
I feel like I have more knowledge, skill, and confidence	4	3	8	1	**16**
Useful in the management of uterine atony/learned external, bimanual compression and can do it	5		3	3	**11**
Partograph very useful/helpful to know what to do with prolonged labor and when to refer	2	1	2	2	**7**
Learned how to better repair episiotomy and tears	1	2			**3**
Helps to make earlier referrals	1	1			**2**
Helps to know when I can manage something myself	1	1			**2**
Learned how to use a more systematic approach (problem-solving)			1	1	**2**
More skilled in doing Stage 2 and Stage 3 labor management		1	1		**2**
Management of shock very useful	1				**1**
Protocols learned in training helps to guide actions to take			1		**1**
Helps in detecting and managing anemia	1				**1**
Doctor now has more confidence in me as a provider	1				**1**
Makes one more careful in conducting deliveries		1			

Objective 3:
Obtain feedback from the participants about how the various in-service education programs increased their knowledge, confidence, and skills in providing quality maternal and newborn care

Complication Audit

As part of the complication audit, the participants who had undergone LSS training (TRAINED bidan, CLINICAL INSTRUCTOR bidan, and TRAINED BDD) or were trained in the Internship Program (INTERN BDD) were asked how the training helped them to manage the complicated case they just described. Their responses are summarized in **Table 21**. The majority of comments focused on manual removal of the placenta (N=35), infant resuscitation (N=29), infection prevention (N=24), and the feeling to have more knowledge, skill, and confidence (N=16), especially among those who had LSS training.

When the comments of the TRAINED and CLINICAL INSTRUCTOR bidan are compared, some differences emerge:

- Confidence with manual removal of the placenta
  TRAINED bidan mention this 13 times versus only six for CLINICAL INSTRUCTORS. This is consistent with the skill assessment in which TRAINED bidan scored slightly higher than CLINICAL INSTRUCTOR bidan.
- Management of uterine atony (external, bimanual compression)
  TRAINED bidan mentioned this five times versus zero for CLINICAL INSTRUCTORS. Again, this is consistent with the slightly higher score among the TRAINED bidan in the skill assessment for bimanual compression.
- Infection prevention
  TRAINED bidan mentioned this one time versus eight times by CLINICAL INSTRUCTORS. This too reflects the results of the skill assessment in which the CLINICAL INSTRUCTOR bidan scored higher than the TRAINED bidan.

When the comments of the TRAINED BDD and INTERN BDD are compared, similar differences emerge.

- *I feel like I have more knowledge, skill, and confidence*
  This is mentioned eight times by TRAINED BDD and only one time for BDD INTERNS.
- *Trained to do/more confident in doing manual removal of the placenta*
  This is mentioned 12 times by TRAINED BDD and only four times by BDD INTERNS.

Specific quotes by each group reflect their opinions:

Quotes made by TRAINED bidan include

— *Before LSS, I had never done manual removal of the placenta. Now, after LSS, with the experience of doing it at the hospital, I feel more confident and can do it alone!*

— *I can do infant resuscitation well now. Before I only used cold water or alcohol to try to revive the baby*

— *Now the doctor that I consult with has more trust in my knowledge and skills.*

Quotes made by CLINICAL INSTRUCTORS include:

— *LSS has been useful to me in helping me with manual removal of the placenta. Before, I could do manual removal of the placenta, but frequently failed. Now, I have been able to do all the manual removals I have attempted.*

— *LSS makes us more careful in conducting the delivery because we want both the mother and baby alive.*

— *In caring for the baby before [LSS training] for resuscitation, I stimulated the baby by hot and cold water. Now it is different; it is faster, easier, and safer!*

— *LSS training has helped to reduce the number of mothers who die because of postpartum hemorrhage in our district. Since the Internship Program has started, 90 BDD have already been TRAINED along with the bidan coordinators TRAINED at the site prep with the other CLINICAL INSTRUCTORS. The deaths due to PP hemorrhage are less in this way: 17 deaths (1997), 12 deaths (1998), and only 5 deaths (1999).*

Table 22
Topics Reported as the Three Most Useful Included in the LSS Training or Internship

	Bidan		Bidan di Desa		
Topics	**TRAINED**	**CLINICAL INSTRUCTOR**	**TRAINED**	**INTERN**	**TOTAL**
Infection prevention	25	23	24	20	**92**
Neonatal resuscitation	19	16	17	19	**71**
Manual removal of the placenta	18	15	16	9	**58**
Partograph	8	9	14	8	**39**
Bimanual compression of uterus	8	1	12	3	**24**
Postpartum hemorrhage	2		8	1	**11**
Managment of third stage (delivery of placenta)	4	3	1		**8**
Postpartum care		1	2		**3**
Antenatal care	2				**2**
Episiotomy	9				**9**
Management of second stage (delivery of baby)		2			**2**
Pre-eclampsia			1		**1**

Quotes made by TRAINED BDD include:

— *This baby was born 45 minutes after the mother started pushing, with a cord around its neck. It did not cry, so I cut the cord immediately, dried, wrapped (warmed), positioned, suctioned, and stimulated the baby, but it still did not cry. I breathed for the baby and did heart massage for three cycles. The baby cried. The mother was so worried that the baby was dead. LSS is especially helpful in knowing how to do infant resuscitation. And if it is successful, the mother will be very happy.*

— *Formerly I did not have the courage to do manual removal of the placenta, but now I feel confident and able to do it myself.*

— *Knowing infection prevention techniques really makes me more confident about preventing infections. Before I did not know how to prevent the spread of hepatitis and HIV. Now I do.*

— *Second stage of labor in LSS is very good. Before I just used the system of pulling the baby's head out with my fingers around the neck. Now I know better how to handle the baby when it delivers.*

Table 23
Topics Reported as the Three Least Useful Included in the LSS Training or Internship

	Bidan		Bidan di Desa		
Topics	**TRAINED**	**CLINICAL INSTRUCTOR**	**TRAINED**	**INTERN**	**TOTAL**
All topics useful	25	12	31	19	**87**
Bimanual compression of uterus-rare		7		1	**8**
Episiotomy	4				**4**
Pregnancy calculator		4			**4**
Management of second stage (delivery of baby)		4			**4**
Admission in labor-already knew		4			**4**
Checking protein/hemoglobin	2				**2**
Decontamination (First step in infection prevention)	2				**2**
Neonatal resuscitation- no O2 available		2			**2**
Breech delivery			1		**1**
BDD register	1				**1**
Manual removal of the placenta (only experience in training with C-section)	1				**1**

Quotes made by BDD INTERNS include:

— *LSS helped me in managing bleeding with external, bimanual compression. I have succeeded!*

— *A 30-year old, G IV mother was attended for a normal delivery by a TBA, but when the baby was born it did not cry. I was called and when I arrived the cord was still attached, the baby was naked, not breathing and blue. So I directly dried the baby, cut the cord, positioned, suctioned, and stimulated the baby by rubbing its back. The baby vomited and then I did full resuscitation with breathing and heart compression. It was successful! The baby cried weakly, then moved more, then became redder. I knew it was important to keep the baby warm. LSS has been useful to me because I have better knowledge and skill on what to do in an emergency like asphyxia.*

— *LSS has helped me because I feel I can work more systematically now.*

Level of Satisfaction of Providers with Training

This tool also provides information to assess the ability of the MotherCare program to meet *Objective 3.* Three areas will be summarized below for all four TRAINED groups (TRAINED bidan, CLINICAL INSTRUCTORS, TRAINED BDD, and INTERNS). Those include opinions about the three most useful and less useful topics included in the training and some recommendations to improve the training program (see **Tables 22 and 23**).

In general, the 117 participants in the four groups (see **Table 22**) mentioned three topics from the training programs most frequently as useful These three topics are infection prevention (92 times), neonatal resuscitation (71 times), and manual removal of the placenta (58 times). Use of the partograph was the fourth most frequently mentioned topic by all but the TRAINED bidan. Episiotomy and repair of episiotomy, which was the fourth most frequently mentioned topic by the TRAINED bidan, was not included in the training for the BDD Bimanual compression was mentioned 24 times, and postpartum hemorrhage was mentioned 11 times, which most likely included bimanual compression.

Eighty-seven of the 118 participants in these four groups felt that all of the topics were useful (74%) (see **Table 23**) Seven of the CLINICAL INSTRUCTORS and one INTERN BDD felt that bimanual compression was not useful because it was rarely used. Four of the TRAINED bidan felt that episiotomy was not useful because of concerns about the integrity of the continuous stitch method (N=3), and it is rarely used (N=1) Other topics were identified as less useful because topics were already known (pregnancy calculator, management of second stage, admission in labor, checking protein & hemoglobin, and decontamination) Two CLINICAL INSTRUCTOR bidan reported that, because oxygen was not available neonatal resuscitation was not useful although new data suggest that ventilation with room air is as effective as with oxygen, and resuscitation without oxygen was discussed in the LSS training Breech delivery was cited by one BDD as less useful although it was described in five of the complicated cases in the complication audit. Breech delivery is not included in the planned curriculum of the LSS training, but it was discussed in one course when a breech delivery occurred during the training

The most prominent recommendation made by the participants of the various training programs is that these programs should continue so that all bidan and BDD receive training (recommended by 53 participants) Five participants called for evaluation on a regular/yearly basis. Fifteen of the participants had no recommendations

Specific recommendations made by the bidan and BDD who participated in the MotherCare LSS training included:

- Related to the location, length of the training, skills included, and the clinical experiences available:

  — Training should be longer (N=12)
  — More practice time is needed in the clinical area (N=9)
  — Training should be in one hospital (N=3)
  — BDD also need advanced LSS skills and episiotomy (N=2)
  — Participants should not go home if they cannot do a skill (N=2)
  — Training should be in a hospital with many cases (N=1)

- Related to the trainers:

  — Trainers should be more patient, more skillful, and not get upset with participants (N=5)
  — Trainers should not change all the time so the participants will not get confused (N=4, TRAINED BDD)
  — Trainers should do visits to districts and villages (N=1, TRAINED bidan)
  — Participants should not be forced so they will not be too tired (N=1, TRAINED BDD)

Specific recommendations made by the bidan and BDD who participated in the Internship Program include:

  — Comparative study needed for the CLINICAL INSTRUCTORS (N=13, 11 CLINICAL INSTRUCTOR bidan)
  — More updating for CLINICAL INSTRUCTORS (N=8, CLINICAL INSTRUCTOR bidan)
  — Trainers in Internship Program should not treat participants like students in midwifery school (N=4, CLINICAL INSTRUCTOR bidan)
  — OB/GYN should teach manual removal of the placenta, neonatal resuscitation, and bimanual compression in Internship Program (N=3, INTERN BDD)
  — Participants in Internship Program should get guide book and pregnancy calculator (N=2, INTERN BDD)
  — BDD should get certificate after completion of internship (N=1, BDD INTERN)
  — Internship should be longer so more time for clinical practice (N=1, TRAINED bidan)

Peer Review and Continuing Education (PR/CE)

Bidan and BDD participated in a peer review process after they had completed the MotherCare LSS training Because HSS was the only district with all the BDD trained, the questions to receive feedback about the PR/CE programs were directed to bidan and BDD from that district.

Responses from nine TRAINED Bidan and 16 TRAINED BDD were received. All of the respondents had at least three peer review visits, and all had attended at least two continuing education sessions They all reported that they found them useful, but no one responded to describe in what way they were useful

Two TRAINED bidan and two TRAINED BDD included the recommendation that the continuing education system be strengthened

A Success Story:

One UNTRAINED BDD from a district in which only the Internship Program had been implemented learned how to do infant resuscitation through a local meeting of her IBI chapter (Ikatan Bidan Indonesia/National Midwifery Association), and she applied it successfully in her practice!

Conclusions

The MotherCare LSS training programs significantly improved the knowledge, confidence, and skills of bidan and BDD. Bidan and BDD who received the training scored higher on the knowledge test and in all five skills than the UNTRAINED bidan and BDD. Clear differences were seen in the management of complicated cases described between the TRAINED and UNTRAINED groups.

- TRAINED groups provided more consistent and appropriate management. Among the UNTRAINED group, unsafe practices and protocols were identified.

- TRAINED bidan and BDD consistently mentioned that training had improved their knowledge, skill, and confidence.

Significantly more of the bidan and BDD who participated in the MotherCare training program were "competent" (defined as a score $\geq$70%) in their knowledge and in their ability to perform the key skills of manual removal of the placenta, neonatal resuscitation, and use of the partograph than the UNTRAINED bidan and BDD.

The passing score of 70 percent was arbitrarily chosen to define a level of knowledge or skill that we would consider "competent/generally safe." We feel that this score is objective as it was chosen after completion of the evaluation and independent of those who assigned the scores (bidan evaluators). This contrasts to educational programs where the passing grade is well known by teachers and students from the onset, and grades are assigned with the passing grade in mind.

Although the percentage of TRAINED providers who attained this score was not as high as desired, these data strongly suggest that the MotherCare training program did increase the "competency" of the bidan and BDD

The content and structure of the MotherCare training program seems to be appropriate for the needs of the Bidan and BDD The level of satisfaction by the participants is high, and the content provides the necessary skills for providers to adequately manage the most frequent complications. Some of the participants requested more practice time in the training to gain more clinical experience. All TRAINED groups noted the following topics as most useful: infection prevention, infant resuscitation, manual removal of the placenta, and use of the partograph. These topics are consistent with the most frequently mentioned complications during the audit: retained placenta, newborn asphyxia, prolonged labor, and uterine atony

When asked what topics were less useful, the large majority of the TRAINED participants stated that all were useful, and the most frequently mentioned recommendation on how to improve the training was to continue the LSS Training Program for all midwives. In addition, a few recommendations related to the trainers' interaction with participants that highlight the need to continue supporting the developing the bidan's skills as trainers.

Little differences were observed in the knowledge and skills when TRAINED bidan who received Advanced LSS training and participated in PR/CE programs were compared to the CLINICAL INSTRUCTOR bidan who also received Advanced LSS training but did not participate in the PR/CE programs Although the CLINICAL INSTRUCTOR bidan had completed their LSS training two years before this evaluation, they actively participated in the intensive site preparation visits to ready their hospitals as internship centers This involved a week that included a "Mini-LSS" work-

shop and intensive work with the CLINICAL INSTRUCTORS on how to teach the LSS skills. In addition, CLINICAL INSTRUCTOR bidan review their knowledge and skills each time they teach INTERN BDD. This may explain their higher scores on the skill assessments for infection prevention.

The TRAINED bidan, some of whom completed their training more than three years prior to this evaluation, do not have this teaching experience to reinforce the correct application of skills. The TRAINED bidan's ability to maintain their skills may reflect the additional emphasis that they have received by serving as peer reviewers in the PR/CE programs.

It is important to note that this evaluation did not compare CLINICAL INSTRUCTORS with bidan who served as trainers in the LSS training programs.

The Internship Program increased the knowledge and skills of the BDD but not to the same level as the MotherCare LSS training and PR/CE programs. The TRAINED BDD scored significantly higher on the skill assessment for manual removal of the placenta, bimanual compression, and neonatal resuscitation. This is perhaps a reflection of several factors:

1) By design, the scope and depth of the LSS training program is greater when compared to the Internship Program.

2) Problem-solving skills are emphasized more in the LSS training program than in the Internship Program

3) The CLINICAL INSTRUCTOR bidan are not as well prepared to teach as the LSS trainers.

4) Manual removal of the placenta, bimanual compression, and neonatal resuscitation require a teaching opportunity in which the skill is used for a woman or baby with the appropriate complication during the training The LSS training center had a volume of patients that was much more likely to provide such opportunities The Internship Program was able to teach infection prevention and use of the partograph, as did the LSS training and PR/CE programs. The lower patient-volume, internship hospitals would be better able to provide enough clinical experience for these two skills since they should be used on all patients.

5) The PR/CE programs may have contribute to the maintenance of skill level among the TRAINED BDD.

The UNTRAINED bidan and BDD do not accurately represent the TRAINED bidan and BDD before they had contact with the MotherCare programs The impact of the program is probably greater than estimated in this evaluation Ideally, the UNTRAINED bidan and BDD are expected to demonstrate the knowledge and skills of the bidan and BDD in South Kalimantan before the introduction of the MotherCare programs However this is not the case. Evidence to support this conclusion is drawn from several observations

1) During the implementation of the MotherCare programs, many of the bidan who attended the "Mini-LSS" workshops requested permission to use the training models to demonstrate skills and information to the BDD who they supervised

2) To date, at least two CE programs have been held at IBI chapter meetings, which are open to all Bidan and BDD in the area, and topics that are covered in the MotherCare training are reviewed at these meetings

3) The scores of the UNTRAINED BDD were generally higher than those of the UNTRAINED bidan. Most of the BDD were scheduled during the second week of the evaluation. Within South Kalimantan, there exists both the ability of those who participated in the first week to discuss the content with those scheduled for the second week and the desire of all participants, with and without training, to do "well."

4) It was noted during the evaluation that BDD were studying while waiting for their evaluations with even UNTRAINED BDD studying from LSS/HMHN books they borrowed from bidan and BDD who had participated in the training. The impact of the exchange of information (#3) and the studying are most evident in the skill assessment scores for infection prevention and use of the partograph—two skills that do not rely so much on clinical experience to master.

The ability of an in-service education program to increase the skill level of the bidan and BDD to an acceptable level is limited. Based on the findings among the UNTRAINED providers in this evaluation, almost all of the bidan and BDD are unable to manage postpartum hemorrhage due to uterine atony or to resuscitate a newborn. Even after training, the percentage of providers who achieved "competency" (defined as ≥70%) was still less than 50 percent for these two skills among the bidan and INTERNS and less than nine percent for bimanual compression for the TRAINED BDD.

This contrasts to the ability of the training program to increase the competency of providers in manual removal of the placenta, a skill that is used often and in which a certain level of competency already existed. Among the UNTRAINED bidan and BDD, about 35 percent achieved a score of ≥70 percent. The MotherCare programs increased this percentage to over 80 percent for the CLINICAL INSTRUCTOR bidan (LSS training + site prep) and to over 94 percent for TRAINED bidan and BDD (LSS training and PR/CE). The Internship Program increased the percentage of providers considered competent in manual removal of the placenta to 61 percent.

Peer Review and Continuing Education Programs appear to be functioning and are well-received by the bidan and BDD. All of the bidan and BDD from HSS districts who responded to the questions related to PR/CE programs reported that they had received at least three PR visits and attended at least two CE sessions They all found them useful, although no specifics of why the programs were useful were given Four participants included "strengthen the continuing education program" in their recommendations for training programs.

The evaluation revealed possible over-use of manual removal of the placenta and under-use of bimanual compression to control bleeding from uterine atony. Manual removal of the placenta was the procedure in which the participants demonstrated the most skill. Retained placenta was also the most frequent reported complication when participants were asked to describe a complicated case In contrast, bimanual compression was the procedure in which the participants demonstrated the least skill, even after training This observation was the opposite of what the two non-Indonesian evaluation team members (Diana Beck and Jeanne McDermott) expected, based on their clinical experiences in USA and other countries Possible explanations were identified after discussion with the bidan evaluators and the LSS trainers:

Manual removal of the placenta

Two factors could be related to why manual removal is done so frequently.

1) Many bidan are not using the appropriate waiting time criteria to start the procedure. The LSS Guidelines state that if no bleeding exists, at least one hour should elapse before attempting

manual removal. However, when some of the participants in the evaluation were asked how long they waited for the placenta to deliver, many bidan and BDD were only waiting 15 to 30 minutes.

2) There is a high prevalence of retained placenta in this population. This was the most frequent complication reported in the complication audit. It is not clear whether there is a higher prevalence in this population due to over-diagnosis, iatrogenic causes, or a truly higher prevalence. In addition to a short waiting time for placenta delivery, it is possible that some of the bidan and BDD are not recognizing a separated and undelivered placenta from a truly retained placenta (incompletely separated), resulting in over-diagnosis. Data from the skill checklist reveal that less than 50 percent of the UNTRAINED bidan and less than 25 percent of the UNTRAINED BDD attempted to deliver the placenta before beginning manual removal of the placenta. However, data from the complication audit indicate that some of the higher prevalence may be due to iatrogenic causes. Bidan and BDD reported being called by a TBA for a retained placenta several hours after the delivery of the baby. This does not support over-diagnosis. It is possible that an intervention by the TBA (possibly, vigorous massage of the uterus immediately after delivery of the baby) contributes in some way to irritation of the uterus and reduced effectiveness in separating the placenta. Any data to support a truly higher than expected prevalence will need to take over-diagnosis and iatrogenic causes into consideration.

Bimanual compression

1) Bimanual compression is not used very often, and it appears to be seen as an action of last resort rather than first resort in the management of uterine atony. The bidan reported that providers, including physicians and obstetricians, first intervene by starting an IV, giving oxytocin drug, and then wait for the bleeding to stop In some cases, this is the only intervention. It is only after the oxytocic fails that bimanual compression, either internally or externally, is used. In these cases, bimanual compression would have a higher probability of failing, thus seen as of little use It does not seem to be well understood that compressing the uterus first, either externally or internally, could stop bleeding sooner than the use of oxytocin, thereby reducing total blood loss.

2) In discussions with the LSS trainers, it also appears that there is reluctance on the part of BDD to use internal, bimanual compression in their home-based practices, as they feel that it will not be well-accepted by the community Evidently, the awareness in the community of the need to deliver the placenta permits the use of manual removal, but once the placenta is delivered, the invasiveness of internal, bimanual compression is unacceptable.

Strengths and Limitations of the Evaluation Design

Strengths

1 Evaluators were blinded to the training status of the participants, thus decreasing bias in scoring

2 Variation in scoring for each skill was minimized by maintaining the same evaluator for the skill throughout the evaluation

3. A series of tools to assess knowledge, skill, and application of skills were used. The complication audit was particularly useful in providing information that would not have been available from a knowledge test or skill assessment.

4. Evaluators were chosen from midwifery leaders (teachers at the midwifery academy and from the national office of IBI) who were also LSS trainers. This provided them with the additional opportunity in identifying the strengths and weakness of the practicing bidan and BDD.

5. Sample size was adequate to identify differences among the groups.

Limitations

1. Although a comparison group was chosen to represent the knowledge, confidence, and skill level of providers who had no exposure to the MotherCare programs, this was not completely successful. A baseline assessment of the providers in all six groups would have helped to better evaluate the impact of the MotherCare programs.

2. Although variations in scoring for each skill was minimized (strength #2), the possibility of variations in the scoring among the skills remains. As a result, it is not advisable to assume that the absolute differences in the scores between two skills reflect the true level of difference in these two skills between TRAINED and UNTRAINED bidan (e.g., the difference of 36 percent in manual removal of the placenta and the 30 percent difference in bimanual compression). Additional preparation time of the bidan evaluators, which would have allowed them to compare how they scored the skills with each other, may have minimized this.

3. Some of the tools should be revised to improve their performance:

   Knowledge Test
   Each question should have only one correct answer. The use of multiple answers in some questions (choose all the correct answers) was possibly confusing to the participants and made the identification of topics that need continuing education more difficult.

   Level of Confidence Rating
   The cultural context should be taken into consideration when determining the number of options for answers. In this evaluation, the participants tended to rate themselves in the middle of the three level scale, "I can do it some" (one point), as it is difficult for them to say either "I am not confident" (zero points) or "I am confident" (two points). Within this context, the ability of the results from this self-assessment tool to provide information about the impact of training on increasing providers' confidence is very limited. Information about confidence was indirectly obtained in the complication audit when participants were asked to comment on how the training helped them in managing the case they described. It seems to be more acceptable for them to say, "I feel much more confident than I did before training". This response was repeated again and again in the participants' reports. Of interest are the slightly higher confidence scores reported by the INTERN BDD than the TRAINED BDD, even though the TRAINED BDD demonstrated higher scores in some of the skill assessments.

   Skill Checklists
   These should be adapted so that information can be assessed more clearly to determine competency The checklists used in this evaluation were adapted from those used in training, and each item on the checklist (from 21 to 31 items) was given equal weight in calculating the

score. For training purposes, this is appropriate. However, for evaluation purposes, particularly in trying to define those who are "competent," it would be more appropriate to try to redesign the checklist. In the redesign, the order of steps and inclusion of those steps considered key to performing the skill at an acceptable level of safety would assist in the analysis of the results. In addition, the key deficits and strengths would be easier to discern.

4. The contribution of PR/CE over and above that of LSS training could not be estimated. Due to the implementation of a package of interventions to improve the quality of care in the MotherCare districts, there were no bidan or BDD who received only LSS training. Although the CLINICAL INSTRUCTORS did not participate in the PR/CE program, the additional site prep time they received augmented their LSS training.

Recommendations

1. The LSS Training Program should continue for other bidan and BDD in South Kalimantan. However, the limitations of an in-service education program to make up for the low skill level of practicing bidan and BDD highlight the need to incorporate the concept that new graduates need to be competent in these LSS skills when they graduate. Unless this is done, the need for in-service education for these skills will not diminish. This needs to be addressed in all the midwifery education programs.

2. The overall content of the LSS Training Program seems to be appropriate and useful for the bidan and BDD and should be maintained. The length of the LSS training program should not be shortened (less than two weeks) and the number of participants should not be increased so that the participants obtain the necessary clinical experiences.

3. Some of the preliminary results of this evaluation were presented to the LSS trainers in South Kalimantan. Copies of the final report in Bahasa, Indonesia with all results will be made available to them. Additional activities to maintain quality and to continue supporting and updating trainers are critical. Activities to consider in supporting trainers includes:

   — A mechanism should be instituted for regular trainer meetings.
   — At least two more weeks of training to focus on clinical and training skills to strengthen the newest LSS trainers (all from Ratu Zalecha, two from Ulin, and one from Banjarbaru Hospitals) and CLINICAL INSTRUCTORS.
   — More experienced trainers from Ulin and Banjarbaru training centers need additional training to become master trainers (trainers who train trainers). The additional training for the newer trainers could be used as an opportunity to upgrade the older trainers to become master trainers. This would involve using an outside consultant with skills and experience of training master trainers in LSS.

4. The Internship Program seems to be an alternative means of upgrading the knowledge, skills, and confidence of the BDD The Internship Program seems to be as able as the LSS training to improve the skills of infection prevention and use of the partograph. These important skills should be used with all deliveries It also seems to be able to improve the skills used in managing retained placenta, uterine atony, and neonatal asphyxia but not to the same level as the LSS training This is probably due to the fact that the scope and depth of training provided in the Internship Program is not as great as that provided in the LSS Training Program, and the skill of the CLINICAL INSTRUCTORS, both clinically and in teaching, is probably not as great as that of LSS trainers.

   In order for the Internship Program to maintain its quality or even improve, the following is recommended

   — The length of an Internship Program needs to be adequate so that each INTERN receives enough supervised clinical experience.

   — CLINICAL INSTRUCTORS be provided with two more weeks of training to focus on clinical and training skills

- CLINICAL INSTRUCTORS should also be involved in trainer meetings. Exposure for CLINICAL INSTRUCTORS to better trained LSS trainers from both a clinical skill and problem-solving ability would be helpful. It could serve as a time to discuss clinical management issues that arise while CLINICAL INSTRUCTORS are training. It also would help to ensure that what is being taught throughout the province stays consistent.

- All INTERN participants should receive HMHN guidebook and pregnancy calculators.

5. Research to explore the causes of retained placenta and the management of uterine atony needs to be undertaken to better understand how to improve the management of these complications.

6. The PR/CE programs should be supported and continued due to popular demand. It is clear that although knowledge and skills were improved with the training, it is possible that more improvement will occur with additional support. The PR/CE teams of each district have a role in continuing to focus on LSS knowledge and skills in the work they do.

Appendix A

Evaluation Tools

FORM 1

KEY: LIFE SAVING SKILLS TEST

DATE:	PARTICIPANT NUMBER:

Test Section	Answered Correctly	Total Points
Infection Prevention		6
Antenatal		13
Care During Labor / Delivery		14
Postpartum		12
Family Planning		5
Total Score		**50**

INSTRUCTIONS: The following questions are: 1) **Multiple choice** - circle the best answer(s), 2) **Fill in the blank** -fill in a one word answer, and 3) **Matching** - put the letter of the correct answer on the line provided. If you have difficulty with a question, go on to the next question. After completing the whole test, return to any unanswered question.

Points

INFECTION PREVENTION (6 points total)

(4) 1 Match the infection prevention step to the correct definition (put the letter to the correct definition on the line provided)

__B_	Decontamination	A	All microorganisms (germs) and all endospores are killed through this step It is used in hospitals for gloves and surgical instruments.
__C_	Cleaning	B	Dirty instruments and non-disposable supplies are soaked in a solution of chlorine to loosen blood or other matter and to reduce the risk of HIV or hepatitis transmission.
__D_	High Level Disinfection	C	Equipment is washed and scrubbed with soap and water to remove blood or other matter
__A_	Sterilization	D	Germs such as viruses, bacteria, fungi, parasites and some endospores are killed by steaming for 20 minutes This step is used for gloves and instruments in facilities with a small number of clients

Points

(2) 2. Ibu Susi, a bidan in the delivery unit at the district hospital, has been trying to be careful about not getting blood on herself ever since she took care of a mother who was HIV positive two months ago. In order to protect herself when caring for a mother during labor and delivery she (circle all that are correct):

A. Goes barefoot but washes her feet after the delivery
* B. Artificially ruptures membranes between contractions
C. Artificially ruptures membranes with contractions
* D. Milks the umbilical cord before clamping and cutting it

ANTENATAL (13 points total)

Today is 7 August and you are seeing Ibu Tina for her first antenatal visit.

During the step of *ASK* and *LISTEN* she tells you that she is 19 years old, happily married for 1 year, and this is her first pregnancy. She usually has menses every month lasting 5 days, although her last menses on 17 April only lasted 2 days. She felt some nausea that started around the end of April but that has gone away, and she began to feel her baby move 4 days ago. She has had no other bleeding, pains, swelling, or itching. Her one complaint is that she has always been more tired than other woman and occasionally gets headaches. She is not taking any medicine and had her last tetanus shot when she got married.

You perform a physical exam (*LOOK* and *FEEL*) and find the following: her BP is 110/80, pulse 60, conjunctiva and fingernails are pale, no swelling, reflexes normal, no kidney tenderness, breasts normal, uterus about 2 finger breaths (2 cm) below the umbilicus, FHR is 156, no scars, vulva normal, hemoglobin 9.2 gm, urine protein negative.

Based on this information please answer the following questions:

(1) 3 Ibu Tina's due date is (circle one only):

A December 5
* B December 26
C January 23
D January 9

(1) 4 The problems/needs you have found include (circle one only):

A Beginning pre-eclampsia only
B Severe anemia only
* C Moderate anemia only
D Completely normal pregnancy
E Beginning pre-eclampsia and severe anemia
F Beginning pre-eclampsia and moderate anemia

Points

(4) 5. The action and advice you will give Ibu Tina includes (circle all correct actions/advice):

A. She will not need another tetanus shot
* B. You will give her another tetanus shot today
C. To come back in one week to have her BP rechecked
D. To take iron with folic acid 1x each day for the rest of her pregnancy
* E. To take iron with folic acid 3x each day for one month and then come back to have her hemoglobin retested
* F. To take her iron pills with foods / juice high in Vitamin C (to help with iron absorption)
G. To drink plenty of milk because it is high in iron
* H. To eat plenty of meats (especially organ meat), beans and grains
I. To see a doctor about her anemia before she has another visit with you

(1) 6. You will need to ask Ibu Tina about having any danger signs of pregnancy (circle one only):

A. At the first visit only
B. Only at the beginning, middle and end of pregnancy
* C. At all visits

(1) 7 Danger signs of pregnancy include all of the following EXCEPT (circle one only):

A. Abdominal (epigastric) pain
B Swelling of face and hands
* C. Dizziness
D. Bleeding
E Headaches
F Baby moving less than usual
G. Visual problems

Ibu Tina is now 38 weeks pregnant She comes to your clinic for another antenatal visit. During this visit you notice that she has some swelling in her hands and face and her BP is 140/90

(3) 8 What should you do now (circle all that are correct)?

* A Ask Ibu Tina if she has any headaches, visual changes, or abdominal pain
* B Give Ibu Tina something to drink
C Recheck Ibu Tina's BP immediately with her lying down
D Ask Ibu Tina to rest on her back for 20 minutes then retake her blood pressure, check her reflexes and check urine protein
* E Ask Ibu Tina to rest on her left side for 20 minutes then retake her blood pressure, check her reflexes and check urine protein
F Refer Ibu Tina immediately

Points

Ibu Tina's BP is still 140/90, protein is positive, reflexes are normal. She states she has had no headaches, visual problems, or abdominal pain, but that the swelling started about 3 days ago.

(2) 9. What action will you take now (circle all that are correct)?

A. Ask Ibu Tina to go home, but to return in 2 days or return immediately if she has any headaches, visual changes or abdominal pain
B. Ask Ibu Tina to go home, but to return in 1 week or return immediately if she has any headaches, visual changes or abdominal pain
* C. Give Diazepam 10 mg IM
* D. Refer immediately

CARE DURING LABOR AND DELIVERY (14 points total)

(3) 10. How do you provide comfort and care to a woman in labor (circle all that are correct)?

A. Advise her to lie on her back
* B. Encourage her to move around and try different positions
C. Give her fluids only when she asks for them
* D Encourage her to empty her bladder at least every 2 hours
* E. Give her information about what to expect and advice before she needs it
F. Give her information about what to expect and advice only when she needs it

(2) 11. Ibu Susy is in labor and is lying on her back What can Ibu Susy's position cause (circle all that are correct)?

A Improved blood circulation for the mother and baby
* B. Poor blood circulation for the mother and baby
C Better contractions
* D Reduced fetal heart rate and possible fetal asphyxia

(2) 12 Ibu Susy's bag of waters rupture spontaneously when she is 9 cm. You find there is meconium in the amniotic fluid What actions will you take **before** the baby is born and **during** the baby's birth (circle all that are correct)?

* A Check the fetal heart rate every 15 minutes
B Wait to suction the baby until after it's body is completely born
C Check the fetal heart rate every 30 minutes
* D Suction the baby after the delivery of its head but before delivery of its body
E Suction the baby's nose first

Points

(2) 13. Ibu Susy is now completely dilated. The care you provide to her while she is pushing should include (circle all that are correct):

A. Catheterize her immediately so she has plenty of room to push the baby through
B. Listen to the fetal heart rate every 30 minutes
* C. Listen to the fetal heart rate every 15 minutes
* D. Take Ibu Susy's BP every 30 minutes
E. Encourage Ibu Susy to get into one position and stay there
F. Push on Ibu Susy's abdomen while she is pushing to help the baby to come out

(1) 14. Ibu Susy's baby girl is born. At one minute after birth the baby is completely blue. The heart rate is 108. The baby has a weak cry and is breathing, but irregularly. The baby does bend it's knees and arms weakly when stimulated. What is the Apgar Score (circle only one)?

* A. 5
B. 6
C. 7
D. 8

~~(2) 15. After evaluating whether Ibu Susy's baby needs infant resuscitation, you decide that you should (circle all that are correct):~~

~~* A. Suction the baby before you dry and warm her~~
~~B. Suction the baby after you dry and warm her~~
~~* C. Stimulate the baby after you suction her~~
4. Stimulate the baby before you suction her
E Help the baby breath by blowing into the baby's mouth (5 breaths then check breathing and heart rate)

(1) 16 If it is already 20 minutes since the baby was born and the placenta still has not delivered, you should (circle only one):

A Rub the uterus hard to try to stimulate the placenta to separate
B While guarding the uterus (use one hand to apply gentle pressure on the abdomen above the pubic bone, to support the uterus upward), pull firmly on the umbilical cord
* C Wait for signs of placental separation, then try to deliver the placenta
D Refer immediately

(1) 17 Ibu Susy's placenta delivers 15 minutes after the delivery of the baby. The first action you should do after the placenta delivers is to (circle only one).

A Give oxytocin IM
B Check the completeness of the placenta
* C Check that the uterus is firm and contracted
D Check Ibu Susy s BP

Points

POSTPARTUM (12 points total)

(1) 18. Encourage a mother and her family to take good care of their newborn baby by (circle only one):

A. Wait to bathe the baby until after the first 12 hours after birth
B. Keep the baby's head covered
C. Keep the baby with the mother
* D. All the above

(1) 19. A baby with the following signs in the first 3 days needs to be referred to the doctor (circle only one):

A. Blue hands and feet
* B. Poor feeding or sucking
C. Weight loss from 2500 gms to 2300 gms
D. All of the above

(3) 20. Advice you can give to Ibu Susy that will help her as she begins to breastfeed includes (circle all that are correct):

* A. Keep your baby with you for the first hour after her delivery
B. Wait at least 4 hours between feedings
* C. It is best to give your baby all the colostrum you make (do not throw any away)
* D. It is helpful for your baby to sleep next to you on the same bed or mat
E It is helpful to give your baby a bottle or some food by 3 to 4 weeks (in addition to your breast milk) so she will sleep better

(3) 21 Ibu Susy is worried that she will not have enough breast milk for her baby. You try to explain to her that a mother's body is made to have enough milk for her baby. You also explain that there are signs she can look for that will tell her that her baby is getting enough milk Those signs include (circle all that are correct):

A Baby urinates at least 4 times in 24 hours
* B Baby is gaining weight
C Baby sleeps all the time
* D Mother can hear quiet little swallowing sounds as the baby swallows
* E Mother's breasts feel soft or empty after a feeding

(1) 22 You are seeing Ibu Susy at 2 weeks postpartum For which of the following symptoms would you counsel her to go to a puskesmas/hospital (circle only one)?

A Tiredness
B Slight vaginal bleeding
* C Abdominal pain
D Temperature of 37 2° C

Points

(3) 23 Ibu Susy's comes to your clinic when she is 4 weeks postpartum. She is worried because her bleeding is still bright red at times and she wants to know if that is normal. As you begin the process of *ASK* and *LISTEN* and *LOOK* and *FEEL* you try to think of what the

possible causes are of extra bleeding at this time postpartum. Please list 3 possible causes of this problem:

A. [Uterine infection]
B. [Retained piece of placenta or membrane]
C. [Not getting enough rest]

FAMILY PLANNING (5 points total)

(1) 24. The best time to begin to counsel Ibu Susy about Family Planning is (circle only one):

A. During antenatal visits
B. Immediately after the delivery
* C. Before her 6 week postpartum visit
D. During her 6 week postpartum visit

(3) 25. In order for Ibu Susy to use breast feeding (LAM) as a family planning method, it is important that (circle all that are correct):

A. She breast feeds her baby at least 5 times a day and once at night
* B. The baby must be less than 6 months old
* C. Breast feeds not be more than 6 hours apart
* D. She has not started her monthly menses
E She gives other food to the baby no more than 1x a day

(1) 26 Depo-Provera and Norplant can not be used by breast feeding mothers:

A. True
* B False

FORM 2

Level of Confidence with Skills

DATE:	PARTICIPANT'S NUMBER:

General Instructions:

- Tick (□) one of the three columns on the right side of the chart to explain how comfortable you are doing the following skills or services.
- Read each statement carefully and do not hurry in your answers.
- Please answer as honestly as possible. The information you fill out is NOT an evaluation of you (no name is put on the paper), but an evaluation of the program. So your honest answer will help improve the program.

A. INFECTION PREVENTION		**Yes**	**Some**	**No**
1.	Know how to decontaminate, clean, high level disinfect, sterilize instruments, equipment, linens, gloves			
2	Know how to safely handle a placenta and explain to family how to also handle safely			
3	Know how to correctly decontaminate and clean a birth area (whether in a home or clinic) like floor, mats, beds, etc			
B.	**INTERPERSONAL COMMUNICATION SKILLS/COUNSELING**	**Yes**	**Sometimes**	**No**
4	Comfortable counseling a new mother about breast feeding			
5	Comfortable counseling a couple about family planning			
6	Comfortable counseling a family about need to refer a woman urgently to next level of care			
7	Comfortable counseling a mother / family / TBA about newborn care			
8	Comfortable counseling a woman who is having side effects from iron folate tablets			
9	Comfortable counseling a mother / family / TBA about how the mother should care for herself postpartum			

C. ANTENATAL CARE	Yes	Sometimes	No
10. Obtain history (medical, social, obstetrical, current pregnancy)			
11. Calculate gestational age and due date from LMP or other signs of pregnancy			
12. Perform a general physical examination			
13. Perform an abdominal examination (fundal height, fetal presentation, fetal heart rate)			
14. Identify size-date discrepancies (uterus is too big or too small for estimate gestational age by dates)			
15. Identify a woman with severe preeclampsia			
16. Identify a woman with hyperreflexia (knee reflex test)			
17. Know what you should do for a woman with severe preeclampsia or eclampsia			
18. Identify a woman who is severely anemic from clinical signs			
19. Know what you should do for a woman with severe anemia			
20. Know what you should do for a woman who is less than 28 weeks gestation and has bleeding			
21. Know what you should do for a woman who is 28 weeks or more gestation and has bleeding			
D. INTRAPARTUM CARE	**Yes**	**Sometimes**	**No**
22. Monitor a woman in labor			
23. Providecare for a woman in labor			
24 Fill out partograph			
25 Identify a woman with abnormal labor			
26 Attend a normal delivery			
27 Attend a woman delivering in an alternative position (on side, squatting, etc)			
28 Deliver a placenta			
29 Estimate blood loss			
30 Manage a postpartum hemorrhage due to uterine atony			
31 Perform internal bimanual uterine compression for uterine atony			
32 Manually remove a retained placenta			
33 Manage a woman in shock			

E. NEWBORN CARE	Yes	Sometimes	No
34. Assess the condition of a newborn after delivery to determine need for resuscitation			
35. Calculate an Apgar score			
36. Perform neonatal resuscitation			
37. Provide care to a newborn			
38. Assist a mother with breast feeding			
39. Determine when a newborn needs referral			
F. POSTPARTUM CARE	**Yes**	**Sometimes**	**No**
40. Give care to a woman in the immediate postpartum period (within 6 hours of birth)			
41. Give care to a woman 3 days after delivery			
42. Give care to a woman 2 weeks after delivery			
43. Give care to a woman 6 weeks after delivery			
44 Identify a woman with postpartum endometritis			
45. Identify a woman with plugged duct (breast)			
46 Provide care for a woman with episiotomy or perineal laceration repair			
47 Manage a woman with a uterine postpartum infection			
48 Manage a woman with breast infection			
49 Determine when a woman needs referral for infection			
50 Work with Dukan (TBA) to provide postpartum care			
G. FOR BIDANS ONLY	**Yes**	**Sometimes**	**No**
51 Perform an episiotomy			
52 Identify perineal and vaginal tears after delivery			
53 Repair an episiotomy, or a perineal or vaginal tear			

FORM 3

Level of Satisfaction of Providers with Training

DATE:	PARTICIPANT'S NUMBER:

General Instructions: Please fill in the following information clearly and specifically.

Do Not Give GENERAL answer such as: "Helps my confidence", or "improves my knowledge and skill"
Give SPECIFIC answer such as: "Before I could not do manual removal of placenta and now I can", "before I did not know all the steps of the infection prevention process now I do", etc.

A. Name 3 topics from your training or internship that you found most useful (starting with No. 1 the most useful, No 2 the next most useful, etc.) and then fill in the other information about the topic asked in the chart:

No.	Topics	Why Most Useful	Since Training Tick (□) one:		If Used, Give Example of How You Used It *(if you need more room please write on back of page)*
			Used	Not Used	
1					
2					
3					

B. Name 3 topics from your training or internship that you have not found useful or less useful:

No.	Topic	Why Not Useful or Less Useful	Since Training Tick (□) one: Used	Not Used
1				
2				
3				

C. What 3 recommendations would you make to trainers providing the MC/LSS training or internship

No.	Recommendations to Improve the Training or Internship
1	
2	
3	

FOR BIDAN AND BIDAN DI DESA WHO HAVE RECEIVED LSS TRAINING IN HSS DISTRICT ONLY:

D. The following questions are about Peer Review and Continuing Education:

1. How many times have you been visited for a Peer Review visit?	Please circle the correct answer: 1) 0 2) 1 3) 2 4) 3 5) 4 or more times
2. Has the visit(s) been useful or not useful?	Please circle the correct answer: 1) Useful 2) Not useful
3. Please explain why it has been useful (please be specific).	
4 How many times have you attended an LSS Continuing Education session?	Please circle the correct answer: 1) 0 2) 1 3) 2 4) 3 5) 4 or more times
5 Has the Continuing Education session(s) been useful or not useful?	Please circle the correct answer: 1) Useful 2) Not useful
6 Please explain why it has been useful (please be specific)	

EVALUATION TOOL
INFECTION PREVENTION

DATE	PARTICIPANT'S NUMBER	SCORE *
		27

* = The score equals the total number of "yes" answers over the total number of points in the tool

Please explain the following to the Ibu Bidan being evaluated:

5. The Case Situation:

   In your house you have just finished helping Ibu Sri to deliver and also did an episiotomy repair. The dukun is with you and Ibu Sri, and she is taking care of Ibu Sri and the baby. You have heard that another mother is coming in labor. You are worried about having enough clean supplies and instruments for the next delivery. So you begin the process of preparing your equipment and supplies starting with Step No. 1 - Decontamination. You go to the decontamination pail with the instruments in an instrument tray. You are still wearing the gloves that you used to do the repair.

6. That you will ask her to demonstrate each step of the "infection prevention process" for:

   1 Supplies (gloves, urinary catheter, needle and syringe)

   2 Instruments (sissors [guting episiotomi], needle holder [alat pemegang jarum], tissue forcep [pinset], and instrument tray)

7 Ask her to explain what she is doing while she is demonstrating.

8) Point out the equipment and supplies you have for her to use for the demonstration.

No.	CRITERIA	Yes	A little	No
	DECONTAMINATION			
Note for evaluator: Ask Ibu Bidan how she mixed the water and byclin to get the correct solution concentration for decontamination				
1	Mix 1 part byclin to 9 parts water (100cc byclin and 900 cc water or 300cc byclin and 2700cc water, etc.). A solution of 0.5% chlorine is needed.			
2	Puts instruments into the pail of chlorine solution			
3	Opens instruments before putting into pail			
4	Flushes catheter with chlorine solution using syringe			
5	Flushes needle with chlorine solution using syringe			
6	Rinses gloves in chlorine solution while still on hands			
7	Puts gloves in chlorine solution inside out			
8	Soaks supplies and equipment for 10 minutes			
Note for evaluator: Ask Ibu Bidan why it is important to do the "decontamination step"				
9	To kill bacteria and viruses, especially HIV and Hepatitis, before someone has contact with it			
	CLEANING			
10	Uses soap water for cleaning process			
11	Puts on heavy cleaning gloves			
12	Rinses catheter and needle/syringe 3 times			
13	Uses cleaning brush to clean all joints on instruments			
14	Washes gloves on both outside and inside			
15	Puts all supplies and instruments into pail with clean water only			
16	Rinses all supplies and instruments in clean water only			
	HIGH LEVEL DISINFECTION (by steaming)			
17	Puts supplies and equipment into pot when water is boiling			
18	Makes sure instruments are open and synnge/needle are separated			

No.	CRITERIA	Yes	A little	No
19	Puts instrument tray on top with sponge forceps easily available (to pick up instruments after steaming)			
20	Covers pot			
21	Steams for 20 minutes			
22	With disinfected sponge forceps, picks up instrument tray and fills tray with instruments, needle, catheter, etc.			
23	Air drys instruments			
24	Covers instrument tray after instruments dried			
25	With disinfected sponge forceps, picks up gloves and hangs them up for drying			
26	Air drys gloves			
27	Stores gloves in disinfected, covered container			

EVALUATION TOOL
MANUAL REMOVAL OF PLACENTA

DATE	PARTICIPANT'S NUMBER	SCORE *
		31

* = The score equals the total number of "yes" answers over the total number of points in the tool

Please explain the following to the Ibu Bidan being evaluated:

9) The Case Situation:

You are attending Ibu Cahaya's third delivery by yourself at Ibu Cahaya's home. The labor went very quickly (1 □ hours) and the baby was born about 20 minutes ago. You have been patiently waiting for signs of placental separation. Suddenly you see a gush of blood, but then the bleeding does not stop. The uterus feels firm. You check for signs of placental separation but they are all negative (no cord lengthening, when you put your hand on the abdomen at the bottom of the uterus and push the uterus upward the cord shortens, and when you follow the cord up the vagina you do not feel the placenta at the cervical opening). You realize that part of the placenta must have separated, but not all. You need to do a manual removal of the placenta quickly because Ibu Cahaya is still bleeding heavily.

10) Explain to Ibu Bidan that you will ask her to demonstrate:

1 What she should explain to the mother and family before manual removal.

2 How to do "manual removal of the placenta"

3 What care she should give the mother immediately after manual removal of the placenta.

3) Ask her to explain what she is doing while she is demonstrating.

9) Point out the equipment and supplies you have for her to use for the demonstration.

No.	CRITERIA	Yes	A little	No
	EXPLAINS TO MOTHER AND FAMILY			
1	Placenta is still attached and Ibu Cahaya is bleeding too much			
2	What she will do			
3	That it hurts but she will finish as quickly and with as little pain as possible			
	STEPS FOR MANUAL REMOVAL OF PLACENTA			
4	Rubs uterus to make it contract			
5	Shows family how to rub uterus			
6	Gives 1 ampule oxytocin IM			
7	Empties bladder (if necessary)			
8	Decides if she has time to start IV (if bleeding too heavy she needs to get the placenta out quickly)			
9	Tries to deliver placenta normally			
Note to evaluator Tell Ibu Bidan that the placenta will not deliver normally and to continue with the steps for manual removal of the placenta				
10	Gives Valium or other medication for pain, if available			
11	Rinses gloves in decontamination solution OR puts on a clean pair of decontaminated gloves			
12	Holds umbilical cord with one hand			
13	With the other hand, inserts it into the vagina following it up the cord			
14	Finds the edge of the placenta that has separated			
15	Lets go of the umbilical cord			
16	With the same hand that held the umbilical cord steadies the uterus through the abdomen			
17	Separates placenta with slicing motion			
18	When placenta is separated rubs the uterus to make it contract			
19	Removes placenta and membranes slowly DURING a contraction			
20	Keeps external hand on uterus while removing placenta			

No.	CRITERIA	Yes	A little	No
21	As placenta delivers, uses both hands to twist placenta			
22	Rubs uterus after delivery of placenta			
23	Checks placenta for completeness			
	CARE TO MOTHER IMMEDIATELY AFTER MANUAL REMOVAL			
24	If IV not started earlier, starts here and adds oxytocic			
25	Runs IV quickly			
26	If oxytocin not effective in contracting uterus, gives 1 ampule methergine IM (if no hypertension)			
27	Estimates blood loss			
28	Monitors vital signs and bleeding (every 15 minutes for 1 hour and then every 30 minutes for 2 more hours)			
29	Makes mother comfortable (fluids, position, hygiene)			
30	Puts baby to breast			
31	Records findings			

10) Thank Ibu Bidan for her demonstration

11) When Ibu Bidan has left, add up her score

12) Call the next Ibu Bidan

Equipment needed for this evaluation:

1 Pelvis
1 Placenta and membranes
1 Sponge forceps or large clamp
1 Container for placenta
1 Pair of sterile gloves
Powder for gloves
1 cloth for "client" to lie on
1 urinary catheter
1 syringe and needle
1 ampule oxytocic

8. Thank Ibu Bidan for her demonstration.

9. When Ibu Bidan has left, add up her score.

10. Call the next Ibu Bidan.

Equipment needed for this evaluation:

1 bottle Byclin
3 plastic pails
1 pair surgical gloves
1 pair heavy cleaning gloves
1 measuring container (IV bottle or measuring cup)
1 needle and syringe
1 episiotomy sissors
1 needle holder
1 forceps
1 sponge forceps
1 urinary catheter
1 instrument tray
1 cleaning brush
Laundry soap
1 boiling pot for instruments
1 container to store gloves

EVALUATION TOOL
EXTERNAL / INTERNAL BIMANUAL COMPRESSION

DATE	PARTICIPANT'S NUMBER	SCORE *
		32

* = The score equals the total number of "yes" answers over the total number of points in the tool

Please explain the following to the Ibu Bidan being evaluated:

1) The Case Situation:

You are attending Ibu Cahaya's third delivery by yourself at Ibu Cahaya's home. The labor went very quickly (1 □ hours) and the baby was born about 20 minutes ago. The placenta delivered completely 15 minutes after the baby was born. Suddenly you see a gush of blood and then the bleeding continues heavily. The uterus feels soft. You had already checked for signs of lacerations after the delivery of the placenta and there were none. You realize that Ibu Cahaya has uterine atony. You need to do bimanual compression of the uterus quickly because Ibu Cahaya is still bleeding heavily.

2) Explain to Ibu Bidan that you will ask her to demonstrate:

2 What she should explain to the mother and family before doing bimanual compression

3 How to do "external and internal bimanual compression of the uterus":

3 What care she should give the mother after she has done bimanual compression of the uterus and the bleeding is under control.

11) Ask her to explain what she is doing while she is demonstrating.

3 Point out the equipment and supplies you have for her to use for the demonstration.

No.	CRITERIA	Yes	Alittle	No
	EXPLAINS TO MOTHER AND FAMILY			
1	Ibu Cahaya is bleeding too much			
2	She must rub the uterus to stop the bleeding			
3	That it hurts but she will finish as quickly and with as little pain as possible			
	STEPS BEFORE EXTERNAL BIMANUAL COMPRESSION			
4	Rubs uterus to make it contract			
5	Shows family how to rub uterus			
6	If there is time start IV or ask assistant to start IV			
7	Gives 1 ampule oxytocin IM or IV			
8	Empties bladder (if necessary)			
	STEPS FOR EXTERNAL BIMANUAL COMPRESSION			
9	Places one hand on the abdomen at the top of the uterus			
10	Places the other hand on the abdomen at the bottom of the uterus			
11	Presses hands together firmly and makes sure uterus is between pressed hands			
12	Looks to see if bleeding has slowed or stopped			
Note to evaluator Tell Ibu Bidan that the bleeding is still very heavy so she should try internal bimanual compression				
	STEPS FOR INTERNAL BIMANUAL COMPRESSION			
13	Rinses gloves in decontamination solution OR puts on a clean pair of decontaminated gloves			
14	Again explains to Ibu Cahaya what she must do			
15	Places examining hand into the vagina			
16	Uses care to move flabby cervix out of the way			
17	Makes hand in vagina into a fist			
18	Presses fist firmly against the lower part of the uterus			
19	Places other hand on abdomen on top and behind uterus			
20	Presses abdominal hand and vaginal fist together so the uterus is			

No.	CRITERIA	Yes	Alittle	No
	squeezed between the two			
21	Holds firmly			
22	Observes if uterus contracts and bleeding stops			
23	If uterus still soft and bleeding continues, opens fist and with fingers massages lower part of uterus around the cervix until uterus gets hard			
24	Does internal compression again to make sure bleeding has stopped			
	CARE TO MOTHER IMMEDIATELY AFTER BIMANUAL COMPRESSION			
25	If IV not started earlier, starts here and adds oxytocic			
26	Runs IV quickly			
27	If oxytocin not effective in contracting uterus, gives 1 ampule methergine IM (if no hypertension)			
28	Estimates blood loss			
29	Monitors vital signs and bleeding (every 15 minutes for 1 hour and then every 30 minutes for 2 more hours)			
30	Makes mother comfortable (fluids, position, hygiene)			
31	Puts baby to breast			
32	Records findings			

4 Thank Ibu Bidan for her demonstration
5 When Ibu Bidan has left, add up her score
6 Call the next Ibu Bidan

Equipment needed for this evaluation:
1 Pelvis
1 Uterus bag
1 Pair of sterile gloves
Powder for gloves
1 cloth for "client" to lie on
1 urinary catheter
1 syringe and needle
1 ampule oxytocic
1 ampule methergine

EVALUATION TOOL
INFANT RESUSCITATION

DATE	PARTICIPANT'S NUMBER	SCORE *
		21

* = The score equals the total number of "yes" answers over the total number of points in the tool

Please explain the following to the Ibu Bidan being evaluated:

2) The case Situation:

You are delivering Ibu Asmah at home. The baby's heart rate has been good during the whole labor, except for the last 15 minutes before the birth. You prepared your supplies and area to do infant resuscitation, in case it is needed. At the time the baby is born, you see there is a cord tightly around the baby's neck. You try to deliver the baby without cutting the cord, but cannot. So you quickly cut the cord and deliver the baby. You check the apgar of the baby and find that it is only a "1" (the "1" is for a heart rate of 30). You quickly begin to do infant resuscitation.

3) That you will ask her to demonstrate 3 levels of support for the baby:

1) First how she would help a baby that needs full breathing and heart resuscitation. This would also include what Ibu Bidan needs to do for "infection prevention" before she begins "mouth-to-mouth resuscitation"

2) After the baby's heart rate rises but the baby is not breathing, you will ask her to demonstrate how to do breathing resuscitation only

3) Finally, after the baby begins to breath you will ask her to demonstrate how to support the baby with stimulation and keeping the baby warm.

12) Point out the equipment and supplies you have for her to use for the demonstration.

No.	CRITERIA	Yes	A little	NO
	FULL BREATHING AND HEART RESUSCITATION			
1	Dries the baby			
2	Removes the wet cloth used to dry the baby			
3	Keeps the baby warm by wrapping with a dry cloth loosely			
4	Positions the baby (puts into the "sniffing" position)			
5	Suctions the baby with the Slime Trap (DeLee)			
6	Stimulates the baby by rubbing her hand up and down the baby's spine			
7	Checks (counts) breathing and heart rate			
8	Wipes the baby's face (uses gauze with chlorine solution, then gauze with soap and water solution, then gauze with clear water)			
9	Breathes 1x for the baby			
10	Checks to see if chest rises			
Note to evaluator Ask Ibu Bidan, if the chest does not rise what should she do?				
11	She positions head again and suctions again			
12	Starts full breathing and heart resuscitation Does 3 cycles (1 cycle = 1 breath + 5 chest compressions)			
13	Correctly positions fingers for chest compression (uses index and middle finger on the center of the baby's chest just below the nipple line)			
14	Correctly compresses baby s chest 1 - 2 cm			
15	Correctly covers the baby's mouth and nose with her mouth when she breathes into the baby			
16	Re checks (counts) breathing and heart rate			
Note to evaluator If Ibu Bidan did the resuscitation completely correctly ask her to go on to the next step. But, if Ibu Bidan seems unsure and/or you want to see her do the resuscitation again, ask her to repeat at least 2 sets of 3 cycles Then mark the "yes" or "no" columns				
Note to evaluator Now tell Ibu Bidan that the baby s heart rate is 110, but the baby is still not breathing. Ask her to go to the next step of breathing resuscitation only				

No.	CRITERIA	Yes	A little	NO
	BREATHING RESUSCITATION ONLY			
17	Breathes for the baby 5x (1 cycle)			
18	Re checks (counts) breathing and heart rate			
Note to evaluator: If Ibu Bidan did the breathing resuscitation completely correctly ask her to go on to the next step. But, if Ibu Bidan seems unsure and/or you want to see her do it again, ask her to repeat at least 2 cycles (5 breaths then check, 5 breaths then check). Then mark the "yes" or "no" columns.				
Note to evaluator: Now tell Ibu Bidan that the baby is breathing OK, but the baby still needs stimulation and warmth. Ask her to demonstrate what she would do.				
	STIMULATION AND WARMTH SUPPORT ONLY			
19	Stimulates the baby by rubbing her hand up and down the baby's spine			
20	Keeps the baby warm either by: 1) wrapping a dry cloth around the baby, or 2) puts the baby skin-to-skin with the mother and covers both of them			
21	Continues to re check (count) breathing and heart rate			

13) Thank Ibu Bidan for her demonstration.

14) When Ibu Bidan has left, add up her score.

15) Call the next Ibu Bidan.

Equipment needed for this evaluation:

1 Infant resuscitation model
3 Small metal bowels (one with chlorine solution, one with soap water, one with clear water)
Gauze
1 Slime trap (DeLee Suction)
3 Blankets or cloths (to put under baby's neck, to dry baby, to warm baby)
1 Stethoscope

PARTOGRAPH CASE STUDY
Ibu Theresia

DATE:	PARTICIPANT'S NUMBER:

Using the information below please fill out a blank partograph and then answer the questions that are asked. This case study ends when the mother is 8 cm.

Ibu Theresia is a 22 year old G1 P0, who goes to the home of the Bidan di Desa in her village, Bidan Lisani, because she is in labor. Bidan Lisani has seen Ibu Theresia for all of her antenatal visits. At 0600 Ibu Theresia arrives at the Bidan's home. Bidan Lisani begins to care for her. During the steps of ASK and LISTEN / LOOK and FEEL, Bidan Lisani finds out the following information about Ibu Theresia: it is two days before her due date, she slept very little last night as she started having contractions, she had a little vaginal blood mixed with mucus yesterday but none today, the baby is moving normally, and she did eat dinner last night and drank some fluids during the night.

Other information she found at 0600 includes (please record on the partograph):

Cervix	1cm
Descent of baby's head	4/5
Fetal Heart Rate	136
Membranes	Intact
Molding	0
Contractions	2 every 10 minutes, lasting 30 seconds
BP	110/60
Pulse	70
Temperature	37.0
Urine	300 cc yellow, protein (-)

Note Between vaginal exams Bidan Lisani has been caring for Ibu Theresia including checking the fetal heart rate and mother's pulse every 30 minutes and contractions every hour Usually these are recorded on the partograph. However for this case study do not record on partograph.

At 1000 Bidan Lisani does another vaginal examination and evaluation (please record on the partograph):

13. Cervix	3 cm
14. Descent of baby's head	3/5
15. Fetal Heart Rate	144
16. Membranes	Intact
17. Molding	0
18. Contractions	3 every 10 minutes, lasting 35 seconds
19. BP	120/60
20. Pulse	76
21. Temperature	37.1
22. Urine	200 cc, yellow

Note: Between vaginal exams Bidan Lisani has been caring for Ibu Theresia including checking the fetal heart rate and mother's pulse every 30 minutes and contractions every hour. Usually these are recorded on the partograph. However for this case study, do not record on partograph.

At 1400 Bidan Lisani does another vaginal examination and evaluation (please record on the partograph):

23. Cervix	8 cm
24. Descent of baby's head	3/5
25 Fetal Heart Rate	156
26 Membranes	Intact
27 Molding	1+ or (+)
28 Contractions	4 every 10 minutes, lasting 55 seconds
29 BP	120/65
30 Pulse	84
31 Temperature	37 4
32 Urine	100 cc, dark yellow

Note Between vaginal exams Bidan Lisani has been caring for Ibu Theresia. Ibu Theresia has been having diarrhea and started vomiting at 1200. Bidan Lisani has been checking the fetal heart rate and mother's pulse every 30 minutes and contractions every hour Usually these are recorded on the partograph However for this case study, do not record on partograph.

At 1600 Bidan Lisani does another vaginal examination and evaluation (please record on the partograph):

33. Cervix	8 cm
34. Descent of baby's head	3/5
35. Fetal Heart Rate	168
36. Membranes	Spontaneous rupture with meconium
37. Molding	2+ or (++)
38. Contractions	3 every 10 minutes, lasting 45 seconds
39. BP	120/70
40. Pulse	90
41. Temperature	37.6
42. Urine	50 cc, dark yellow

Note: Between vaginal exams Bidan Lisani has been caring for Ibu Theresia including checking the fetal heart rate and mother's pulse every 30 minutes and contractions every hour Usually these are recorded on the partograph. However for this case study, do not record on partograph.

43. How long is Latent Phase labor while Ibu Theresia is at the home of Bidan Lisani?

44 How long is Active Phase labor up to the time of the last vaginal examination at 1600?

45 How often should the fetal heart rate be checked after the examination at 1000?

46 Why (for question No 43)?

47 How often should the fetal heart rate be checked after the examination at 1600?

48 There are two reasons for your answer in question No 45 What are they?

A

B

49. Normally, according to partograph protocol, vaginal exams are done every 4 hours. Why did Bidan Lisani wait only 2 hours to do the vaginal examination at 1600?

16) At what time would you be worried about Ibu Theresia's hydration level?

17) How can dehydration affect the mother (give 2 answers)?

A.

B.

18) How can dehydration affect the baby (give 1 answer)?

19) Should Bidan Lisani refer Ibu Theresia to the hospital?

A (circle one) Yes / No

4 If yes, at what time?

7 If yes, give 3 reasons for the referral

1)

2)

3)

FORM 9

Review of Complicated Case

DATE:	PARTICIPANT'S NUMBER:

Notes to Evaluator:

Please ask the respondent to describe a case of a severe complication that was life-threatening that she has had in the last year of a mother or a newborn for whom she provided care.

- Please help guide the respondent to be very specific in her answers, not general.

- It is important for the respondent to know that each question below is about the complicated case she had. To help her remember this please do the following: when the respondent begins to discuss the complicated case, ask her the name of the mother that had the complication. Then whenever you ask a question to the respondent about the case, use the mother's name. For example if the respondent says the mother's name was Ibu Cahaya, with the question "What was the result / outcome for the mother?", ask the respondent "What was the outcome for Ibu Cahaya?".

Questions to Respondents:

1. What was the reason the mother/family looked for care from you or from your puskesmas or hospital?

2 What questions did you ask the mother to find out more about the problem she was having?

3 What did you check during the physical examination to find out more about the problem she was having?

4. What did you decide were the mother's or baby's Needs or Problems (Diagnosis)?

5. What did you do for the needs or problems that you diagnosed (Management)?

. What was the outcome for the mother and the baby (for example: did the mother or baby live or die, was the mother or baby in a hospital for a long time, was the mother or baby sick long after the complication happened, did the mother or baby get well right away)?

For TRAINED PROVIDERS Only:

7. How did the training help you give care to the mother or baby for this complication?

Additional Question NOT ABOUT THE ABOVE COMPLICATED CASE:

8 Please ask ***ALL*** respondents about the complications noted in the chart below that they have provided care for and/or referred ***in the last year*** (total in their private practice, puskesmas, and hospital) and ***the number of cases*** in the last year for each complication.

Complications	No. Of Cases in Last Year
PP Hemorrhage	
Prolonged Labor	
Pre-Eclampsia / Eclampsia	
Fetal Distress (fetal heart rate abnormal during labor)	
Newborn Asphyxia (baby has difficulty breathing after birth)	

Table B-1
Percent of Bidan Who Reported Feeling Confident in Performing Skills—by Training Status

	TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
INFECTION PREVENTION				
1. Know how to decontaminate, clean, high level disinfect, sterilize instruments, equipment, linens, gloves	30%	26%	0%	0.01
2. Know how to safely handle a placenta and explain to family how to also handle safely	27%	17%	4%	0.08
3. Know how to correctly decontaminate and clean a birth area (whether in a home or clinic) like floor, mats, beds, etc.	39%	17%	0%	0.001
INTERPERSONAL COMMUNICATION SKILLS/COUNSELING				
4 Comfortable counseling a new mother about breastfeeding	30%	13%	29%	0.29
5 Comfortable counseling a couple about family planning	27%	13%	25%	0.43
6 Comfortable counseling a family about need to refer a woman urgently to next level of care	27%	9%	25%	0.21
7 Comfortable counseling a mother/family/TBA about newborn care	24%	9%	25%	0.27
8 Comfortable counseling a woman who is having side effects from iron/folate tablets	42%	13%	21%	0.04
9 Comfortable counseling a mother/family/TBA about how the mother should care for herself postpartum	27%	9%	17%	0.21
ANTENATAL CARE				
10 Obtain history (medical, social, obstetrical current pregnancy)	21%	9%	0%	0.04
11 Calculate gestational age and due date from LMP or other signs of pregnancy	24%	13%	25%	0.52
12 Perform a general physical examination	36%	9%	25%	0.06
13 Perform an abdominal examination (fundal height fetal presentation, fetal heart rate)	36%	39%	33%	0.92
14 Identify size-date discrepancies (uterus is too big or too small for estimate gestational age by dates)	15%	30%	13%	0.23
15 Identify a woman with severe pre-eclampsia	36%	30%	4%	0.02

Table B-1
Percent of Bidan Who Reported Feeling Confident in Performing Skills—by Training Status

	TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
16. Identify a woman with hyper-reflexia (knee reflex test)	27%	9%	0%	0.009
17. Know what you should do for a woman with severe pre-eclampsia or eclampsia	21%	9%	4%	0.13
18. Identify a woman who is severely anemic from clinical signs	42%	26%	8%	0.02
19. Know what you should do for a woman with severe anemia	42%	26%	8%	0.02
20. Know what you should do for a woman who is less than 28 weeks gestation and has bleeding	15%	35%	8%	0.05
21. Know what you should do for a woman who is 28 weeks or more gestation and has bleeding	12%	30%	4%	0.03
INTRAPARTUM CARE				
22. Monitor a woman in labor	33%	26%	17%	0.37
23 Provide care for a woman in labor	30%	26%	29%	0.94
24 Fill out partograph	12%	30%	0%	0.01
25 Identify a woman with abnormal labor	18%	30%	4%	0.06
26 Attend a normal delivery	46%	39%	42%	0.89
27. Attend a woman delivering in an alternative position (on side, squatting, etc)	0%	4%	0%	0.29
28 Deliver a placenta	30%	35%	33%	0.93
29 Estimate blood loss	21%	9%	21%	0.42
30 Manage a postpartum hemorrhage due to uterine atony	9%	9%	4%	0.76
31 Perform internal bimanual uterine compression for uterine atony	3%	0%	0%	0.49
32 Manually remove a retained placenta	18%	4%	0%	0.04
33 Manage a woman in shock	9%	26%	4%	0.06
FOR BIDAN ONLY				
51 Perform an episiotomy	30%	26%	0%	0.01
52 Identify perineal and vaginal tears after delivery	18%	30%	0%	0.02

Table B-1
Percent of Bidan Who Reported Feeling Confident in Performing Skills—by Training Status

	TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
53. Repair an episiotomy or a perineal or vaginal tear	21%	22%	0%	0.05
NEWBORN CARE				
34. Assess the condition of a newborn after delivery to determine need for resuscitation	21%	26%	4%	0.11
35. Calculate an APGAR score	15%	22%	4%	0.21
36. Perform neonatal resuscitation	18%	4%	4%	0.12
37. Provide care to a newborn	33%	26%	13%	0.20
38. Assist a mother with breastfeeding	39%	39%	29%	0.69
39. Determine when a newborn needs referral	27%	9%	17%	0.21
POSTPARTUM CARE				
40 Give care to a woman in the immediate postpartum period (within 6 hours of birth)	24%	4%	13%	0.11
41 Give care to a woman 3 days after delivery	27%	9%	17%	0.21
42 Give care to a woman 2 weeks after delivery	21%	9%	13%	0.40
43 Give care to a woman 6 weeks after delivery	18%	4%	13%	0.31
44 Identify a woman with postpartum endometritis	3%	4%	0%	0.61
45 Identify a woman with plugged duct (breast)	9%	4%	4%	0.68
46 Provide care for a woman with episiotomy or perineal laceration repair	24%	26%	8%	0.23
47 Manage a woman with a uterine postpartum infection	3%	4%	0%	0.61
48 Manage a woman with breast infection	9%	9%	0%	0.32
49 Determine when a woman needs referral for infection	15%	9%	0%	0.14
50 Work with Dukan (TBA) to provide postpartum care	33%	9%	17%	0.07

Table B-2
Percent of Bidan Who Performed Steps for Infection Prevention Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
DECONTAMINATION					
1	Describes mixing 1 part byclin to 9 parts water (100cc byclin and 900 cc water or 300cc byclin and 2700cc water, etc.). A solution of 0.5% chlorine is needed.	39%	65%	46%	0.15
2	Puts instruments into the pail of chlorine solution	94%	100%	88%	0.21
3	Opens instruments before putting into pail	24%	39%	4%	0.02
4	Flushes catheter with chlorine solution using syringe	9%	30%	8%	0.05
5	Flushes needle with chlorine solution using syringe	3%	30%	8%	0.007
6	Rinses gloves in chlorine solution while still on hands	3%	17%	0%	0.03
7	Puts gloves in chlorine solution inside out	12%	26%	4%	0.09
8	Soaks supplies and equipment for 10 minutes	88%	91%	58%	0.006
9	Gives reason: To kill bacteria and viruses, especially HIV and Hepatitis, before someone has contact with it	42%	48%	13%	0.02
CLEANING					
10	Uses soap water for cleaning process	73%	91%	71%	0.17
11	Puts on heavy cleaning gloves	76%	96%	38%	<0.001
12	Rinses catheter and needle/syringe 3 times	9%	39%	8%	0.005
13	Uses cleaning brush to clean all joints on instruments	67%	100%	67%	0.007
14	Washes gloves on both outside and inside	24%	44%	21%	0.17
15	Puts all supplies and instruments into pail with clean water only	79%	96%	67%	0.04
16	Rinses all supplies and instruments in clean water only	67%	78%	50%	0.12
HIGH LEVEL DISINFECTION (BY STEAMING)					

Table B-2
Percent of Bidan Who Performed Steps for Infection Prevention Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
17	Puts supplies and equipment into pot when water is boiling	76%	74%	38%	0.006
18	Makes sure instruments are open and syringe/needle are separated	18%	22%	13%	0.70
19	Puts instrument tray on top with sponge forceps easily available (to pick up instruments after steaming)	30%	26%	13%	0.28
20	Covers pot	73%	91%	67%	0.11
21	Steams for 20 minutes	91%	91%	58%	0.003
22	With disinfected sponge forceps, picks up instrument tray and fills tray with instruments, needle, catheter, etc.	58%	57%	42%	0.44
23	Air dries instruments	18%	17%	21%	0.95
24	Covers instrument tray after instruments dried	76%	83%	71%	0.64
25	With disinfected sponge forceps, picks up gloves and hangs them up for drying	21%	44%	8%	0.02
26	Air dries gloves	18%	39%	8%	0.03
27	Stores gloves in disinfected, covered container	58%	87%	50%	0.02

Table B-3
Percent of Bidan Who Performed Steps for Manual Removal of the Placenta Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
EXPLAINS TO MOTHER AND FAMILY					
1	Placenta is still attached and Ibu Cahaya is bleeding too much	100%	100%	96%	0.31
2	What she will do	100%	100%	96%	0.31
3	That it hurts but she will finish as quickly and with as little pain as possible	100%	100%	83%	0.007
STEPS FOR MANUAL REMOVAL OF THE PLACENTA					
4	Rubs uterus to make it contract	94%	87%	42%	<0.001
5	Shows family how to rub uterus	82%	70%	4%	<0.001
6	Gives 1 ampule oxytocin IM	94%	61%	63%	0.005
7	Empties bladder (if necessary)	97%	96%	88%	0.31
8	Decides if she has time to start IV (if bleeding too heavy she needs to get the placenta out quickly)	100%	96%	92%	0.26
9	Tries to deliver placenta normally	91%	83%	50%	0.001
10	Gives Valium or other medication for pain, if available	67%	70%	13%	<0.001
11	Rinses gloves in decontamination solution OR puts on a clean pair of decontaminated gloves	100%	96%	96%	0.49
12	Holds umbilical cord with one hand	91%	78%	46%	<0.001
13	With the other hand, inserts it into the vagina following it up the cord	100%	87%	50%	<0.001
14	Finds the edge of the placenta that has separated	100%	87%	42%	<0.001
15	Lets go of the umbilical cord	94%	70%	33%	<0.001
16	With the same hand that held the umbilical cord steadies the uterus through the abdomen	97%	74%	38%	<0.001
17	Separates placenta with slicing motion	94%	78%	38%	<0.001
18	When placenta is separated, rubs the uterus to make it contract	94%	70%	29%	<0.001
19	Removes placenta and membranes slowly DURING a contraction	94%	65%	25%	<0.001
20	Keeps external hand on uterus while removing placenta	97%	74%	38%	<0.001

Table B-3
Percent of Bidan Who Performed Steps for Manual Removal of the Placenta Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
21	As placenta delivers, uses both hands to twist placenta	94%	70%	29%	<0.001
22	Rubs uterus after delivery of placenta	97%	74%	25%	<0.001
23	Checks placenta for completeness	97%	91%	75%	0.03
CARE TO MOTHER IMMEDIATELY AFTER MANUAL REMOVAL					
24	If IV not started earlier, starts here and adds oxytocin	97%	87%	58%	<0.001
25	Runs IV quickly	88%	57%	33%	<0.001
26	If oxytocin not effective in contracting uterus, gives 1 ampule methergine IM (if no hypertension)	91%	61%	17%	<0.001
27	Estimates blood loss	94%	61%	33%	<0.001
28	Monitors vital signs and bleeding (every 15 minutes for 1 hour and then every 30 minutes for 2 more hours)	97%	83%	50%	<0.001
29	Makes mother comfortable (fluids, position, hygiene)	100%	87%	46%	<0.001
30	Puts baby to breast	100%	87%	46%	<0.001
31	Records findings	97%	91%	21%	<0.001

Table B-4
Percent of Bidan Who Performed Steps for Bimanual Compression Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
EXPLAINS TO MOTHER AND FAMILY					
1	Ibu Cahaya is bleeding too much	79%	70%	29%	<0.001
2	She must rub the uterus to stop the bleeding	58%	61%	13%	<0.001
3	That it hurts but she will finish as quickly and with as little pain as possible	36%	39%	4%	0.009
STEPS BEFORE EXTERNAL, BIMANUAL COMPRESSION					
4	Rubs uterus to make it contract	52%	17%	4%	<0.001
5	Shows family how to rub uterus	9%	0%	0%	.11
6	If there is time start IV or ask assistant to start IV	6%	0%	0%	.23
7	Gives 1 ampule oxytocin IM or IV	46%	9%	0%	<0.001
8	Empties bladder (if necessary)	46%	22%	4%	.002
STEPS FOR EXTERNAL, BIMANUAL COMPRESSION					
9	Places one hand on the abdomen at the top of the uterus	18%	13%	0%	0.10
10	Places the other hand on the abdomen at the bottom of the uterus	18%	13%	0%	0.10
11	Presses hands together firmly and makes sure uterus is between pressed hands	18%	13%	0%	0.10
12	Looks to see if bleeding has slowed or stopped	21%	13%	0%	0.06
STEPS FOR INTERNAL, BIMANUAL COMPRESSION					
13	Rinses gloves in decontamination solution OR puts on a clean pair of decontaminated gloves	27%	22%	0%	.02
14	Again explains to Ibu Cahaya what she must do	27%	26%	0%	0.02
15	Places examining hand into the vagina	6%	22%	0%	0.02
16	Uses care to move flabby cervix out of the way	6%	9%	0%	0.37
17	Makes hand in vagina into a fist	15%	13%	0%	0.14
18	Presses fist firmly against the lower part of the uterus	15%	13%	0%	0.14

Table B-4
Percent of Bidan Who Performed Steps for Bimanual Compression Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
19	Places other hand on abdomen on top and behind uterus	15%	13%	0%	0.14
20	Presses abdominal hand and vaginal fist together so the uterus is squeezed between the two	15%	17%	0%	0.11
21	Holds firmly	21%	17%	0%	0.06
22	Observes if uterus contracts and bleeding stops	15%	17%	0%	0.11
23	If uterus still soft and bleeding continues, opens fist and with fingers massages lower part of uterus around the cervix until uterus gets hard	18%	17%	0%	0.09
24	Does internal compression again to make sure bleeding has stopped	18%	17%	0%	0.09
CARE TO MOTHER IMMEDIATELY AFTER BIMANUAL COMPRESSION					
25	If IV not started earlier, starts here and adds oxytocin	12%	9%	0%	0.22
26	Runs IV quickly	12%	0%	0%	0.05
27	If oxytocin not effective in contracting uterus, gives 1 ampule methergine IM (if no hypertension)	15%	13%	0%	0.14
28	Estimates blood loss	0%	0%	0%	1.00
29	Monitors vital signs and bleeding (every 15 minutes for 1 hour and then every 30 minutes for 2 more hours)	6%	9%	0%	0.37
30	Makes mother comfortable (fluids, position hygiene)	6%	22%	4%	0.08
31	Puts baby to breast	6%	17%	4%	0.21
32	Records findings	9%	13%	0%	0.21

Table B-5
Percent of Bidan Who Performed Steps for Neonatal Resuscitation Correctly--by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
FULL BREATHING AND HEART RESUSCITATION					
1	Dries the baby	73%	83%	42%	0.007
2	Removes the wet cloth used to dry the baby	58%	78%	33%	0.008
3	Keeps the baby warm by wrapping with a dry cloth loosely	52%	83%	42%	0.01
4	Positions the baby (puts into the 'sniffing' position)	49%	87%	42%	0.003
5	Suctions the baby with the Slime Trap (DeLee)	55%	78%	38%	0.02
6	Stimulates the baby by rubbing her hand up and down the baby's spine	21%	44%	0%	0.001
7	Checks (counts) breathing and heart rate	12%	30%	0%	0.01
8	Wipes the baby's face (uses gauze with chlorine solution, then gauze with soap and water solution, then gauze with clear water)	30%	52%	13%	0.01
9	Breathes 1x for the baby	36%	57%	4%	<0.001
10	Checks to see if chest rises	36%	52%	4%	0.001
11	No so she positions head again and suctions again	33%	35%	0%	0.005
12	Starts full breathing and heart resuscitation Does 3 cycles (1 cycle = 1 breath + 5 chest compressions)	42%	44%	0%	<0.001
13	Correctly positions fingers for chest compression (uses index and middle finger on the center of the baby's chest just below the nipple line)	39%	48%	0%	<0.001
14	Correctly compresses baby's chest 1-2cm	42%	48%	0%	<0.001
15	Correctly covers the baby's mouth and nose with her mouth when she breathes into the baby	39%	52%	0%	<0.001
16	Rechecks (counts) breathing and heart rate	21%	30%	0%	0.02
BREATHING RESUSCITATION ONLY					
17	Breathes for the baby 5x (1 cycle)	12%	17%	0%	0.12

Table B-5
Percent of Bidan Who Performed Steps for Neonatal Resuscitation Correctly--by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
18	Rechecks (counts) breathing and heart rate	6%	4%	0%	0.49
STIMULATION AND WARMTH SUPPORT ONLY					
19	Stimulates the baby by rubbing her hand up and down the baby's spine	6%	9%	0%	0.37
20	Keeps the baby warm either by: 1) wrapping a dry cloth around the baby, or 2) puts the baby skin-to-skin with the mother and covers both of them	6%	0%	0%	0.23
21	Continues to recheck (count) breathing and heart rate	3%	0%	0%	0.49

Table B-6
Percent of Bidan Who Complete and Interpret the Partograph Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
COMPLETES (FILLS OUT)					
1	Cervical dilatation	64%	78%	29%	0.002
2	Descent of the head	64%	74%	17%	<0.001
3	Fetal heart rate	61%	78%	25%	<0.001
4	Status of membranes/color of amniotic fluid	67%	70%	42%	0.09
5	Molding of head	70%	70%	33%	0.01
6	Frequency and duration of contractions	52%	57%	25%	0.06
7	Maternal blood pressure	61%	87%	42%	0.006
8	Maternal pulse	70%	78%	50%	0.11
9.	Maternal temperature	79%	78%	54%	0.09
10.	Urine (amount, color, protein)	76%	83%	46%	0.01
INTERPRETATION AND MANAGEMENT OF PARTOGRAPH					
41	Length of latent phase· 4 hours	76%	70%	50%	0.12
42	Length of active phase: 6 hours	67%	74%	42%	0.05
43	Frequency of FHR checks after 1000 every 30 minutes	88%	83%	79%	0.67
44	Reason for #43· Partograph protocol/guidelines state that FHR should be checked every 30 minutes in Stage I Labor	27%	39%	13%	0.11
45	Frequency of FHR checks after 1600 every 15 minutes	79%	87%	54%	0.03
46 A	Reasons for #45 FHR is above 160 (it is 168)	73%	78%	54%	0.17
46 B	Meconium in the amniotic fluid (Another acceptable answer - mom's temperature is 37 6°)	61%	61%	25%	0.01

Table B-6
Percent of Bidan Who Complete and Interpret the Partograph Correctly—by Training Status

		TRAINED N=33	CLINICAL INSTRUCTORS N=23	UNTRAINED N=24	P value
47	Reason for vaginal exam in 2 hours at 1600: Because if Ibu Theresa's labor progress is normal, she should dilate at least 1 cm per hour and be completely dilated by 1600. So Ibu Lisani checked to make sure her labor progress was normal (and to encourage her to begin pushing as soon as the cervix is completely open).	21%	48%	13%	0.02
48	Time and reason for concern at hydration level: At 1400 when she only urinated 100 cc, it was dark yellow, and her temperature rose to 37.4° C	52%	48%	38%	0.57
49. A.	How dehydration affects mom: It can cause the mother's uterus to work less effectively (poorer contractions)	67%	78%	54%	0.22
49 B.	It can cause the mother's temperature to rise (Another acceptable answer - it can make the mother more tired)	52%	74%	50%	0.17
50	How dehydration affects baby It can increase the baby's heart rate	82%	87%	58%	0.04
51 A	Yes, needs referral	91%	100%	75%	0.02
51 B	1600 (time)	67%	70%	50%	0.31
51 C 1)	Reason #1 for referral Went over the alert line (No cervical dilatation in 2 hours)	18%	30%	17%	0.44
51 C 2)	Reason #2 for referral Meconium in the amniotic fluid	52%	61%	33%	0.15
51 C 3)	Reason #2 for referral Fetal heart rate is above 160 s(Another acceptable answer - the mother has a high temperature)	49%	74%	38%	0.04

Table C-1
Percent of Bidan di Desa Who Reported Feeling Confident in Performing Skills by Training Status

	TRAINED N=33	INTERNS N=28	UNTRAINED N=47	P value
INFECTION PREVENTION				
1 Know how to decontaminate, clean, high level disinfect, sterilize instruments, equipment, linens, gloves	30%	43%	11%	0.005
2 Know how to safely handle a placenta and explain to family how to also handle safely	30%	36%	13%	0.05
3 Know how to correctly decontaminate and clean a birth area (whether in a home or clinic) like floor, mats, beds, etc	24%	43%	17%	0.05
INTERPERSONAL COMMUNICATION SKILLS/COUNSELING				
4 Comfortable counseling a new mother about breastfeeding	42%	64%	40%	0.11
5 Comfortable counseling a couple about family planning	36%	57%	28%	0.04
6 Comfortable counseling a family about need to refer a woman urgently to next level of care	24%	54%	32%	0.05
7 Comfortable counseling a mother/family/TBA about newborn care	46%	50%	36%	0.46
8 Comfortable counseling a woman who is having side effects from iron folate tablets	46%	61%	30%	0.03
9. Comfortable counseling a mother/family/TBA about how the mother should care for herself postpartum	36%	54%	30%	0.12
ANTENATAL CARE				
10. Obtain history (medical, social, obstetrical, current pregnancy)	21%	54%	30%	0.02
11. Calculate gestational age and due date from LMP or other signs of pregnancy	39%	61%	47%	0.24
12. Perform a general physical examination	49%	46%	36%	0.49
13. Perform an abdominal examination (fundal height, fetal presentation, fetal heart rate)	49%	64%	45%	0.25
14. Identify size-date discrepancies (uterus is too big or too small for estimate gestational age by dates)	21%	25%	19%	0.84
15. Identify a woman with severe pre-eclampsia	36%	43%	26%	0.28
16. Identify a woman with hyper-reflexia (knee reflex test)	24%	18%	15%	0.57
17. Know what you should do for a woman with severe pre-eclampsia/eclampsia	18%	39%	21%	0.12

Table C-1

Percent of Bidan di Desa Who Reported Feeling Confident in Performing Skills by Training Status

	TRAINED N=33	INTERNS N=28	UNTRAINED N=47	P value
18 Identify a woman who is severely anemic from clinical signs	39%	36%	40%	0.92
19 Know what you should do for a woman with severe anemia	39%	39%	21%	0.13
20 Know what you should do for a woman who is less than 28 weeks gestation and has bleeding	18%	21%	9%	0.25
21 Know what you should do for a woman who is 28 weeks or more gestation and has bleeding	15%	29%	11%	0.13
INTRAPARTUM CARE				
22 Monitor a woman in labor	42%	54%	38%	0.43
23 Provide care for a woman in labor	39%	54%	40%	0.46
24 Fill out partograph	18%	18%	11%	0.56
25 Identify a woman with abnormal labor	12%	11%	13%	0.97
26 Attend a normal delivery	42%	50%	60%	0.31
27. Attend a woman delivering in an alternative position (on side, squatting, etc)	9%	7%	0%	0.12
28 Deliver a placenta	46%	43%	38%	0.81
29. Estimate blood loss	18%	25%	9%	0.15
30. Manage a postpartum hemorrhage due to uterine atony	3%	11%	11%	0.42
31. Perform internal bimanual uterine compression for uterine atony	0%	0%	0%	1.00
32. Manually remove a retained placenta	18%	21%	15%	0.77
33. Manage a women with shock	18%	25%	9%	0.15
NEWBORN CARE				
34. Assess the condition of a newborn after delivery to determine need for resuscitation	24%	46%	19%	0.03
35. Calculate an APGAR score	6%	21%	13%	0.20
36. Perform neonatal resuscitation	9%	29%	11%	0.06

Table C-1
Percent of Bidan di Desa Who Reported Feeling Confident in Performing Skills by Training Status

	TRAINED N=33	INTERNS N=28	UNTRAINED N=47	P value
37 Provide care to a newborn	36%	57%	40%	0.22
38 Assist a mother with breastfeeding	39%	61%	49%	0.25
39 Determine when a newborn needs referral	39%	43%	21%	0.09
POSTPARTUM CARE				
40 Give care to a woman in the immediate postpartum period (within 6 hours of birth)	33%	50%	30%	0.20
41 Give care to a woman 3 days after delivery	49%	54%	36%	0.29
42. Give care to a woman 2 weeks after delivery	39%	46%	26%	0.15
43 Give care to a woman 6 weeks after delivery	30%	36%	26%	0.64
44 Identify a woman with postpartum endometritis	6%	0%	0%	0.10
45. Identify a woman with plugged duct (breast)	21%	36%	6%	0.006
46. Provide care for a woman with episiotomy or perineal laceration repair	24%	39%	38%	0.35
47. Manage a woman with a uterine postpartum infection	6%	0%	2%	0.33
48. Manage a woman with breast infection	9%	14%	6%	0.52
49. Determine when a woman needs referral for infection	24%	25%	17%	0.63
50. Work with Dukan (TBA) to provide postpartum care	30%	43%	45%	0.40

Table C-2

Percent of Bidan di Desa Who Performed Step for Infection Prevention Correctly by Training Status

		TRAINED N=33	INTERNS N=28	UNTRAINED N=47	P value
DECCNTAMINATION					
1	Describes mixing 1 part byclin to 9 parts water (100cc byclin and 900cc water or 300cc byclin and 2700cc water, etc) A solution of 0 5% chlorine is needed	73%	64%	55%	0.28
2	Puts instruments into the pail of chlorine solution	100%	100%	92%	0.07
3	Opens instruments before putting into pail	67%	61%	53%	0.47
4	Flushes catheter with chlorine solution using syringe	49%	36%	30%	0.23
5	Flushes needle with chlorine solution using syringe	46%	21%	36%	0.14
6	Rinses gloves in chlorine solution while still on hands	21%	7%	11%	0.22
7	Puts gloves in chlorine solution inside out	52%	86%	75%	0.01
8	Soaks supplies and equipment for 10 minutes	91%	93%	75%	0.05
9	Gives reason To kill bacteria and viruses, especially HIV and Hepatitis, before someone has contact with it	36%	39%	30%	0.67
CLEANING					
10	Uses soap water for cleaning process	100%	96%	89%	0.11
11	Puts on heavy cleaning gloves	94%	79%	64%	0.007
12	Rinses catheter and needle/syringe 3 times	52%	57%	26%	0.01
13	Uses cleaning brush to clean all joints on instruments	97%	100%	85%	0.03
14	Washes gloves on both outside and inside	61%	46%	34%	0.06
15	Puts all supplies and instruments into pail with clean water only	100%	100%	92%	0.07
16	Rinses all supplies and instruments in clean water only	97%	89%	83%	0.15
HIGH LEVEL DISINFECTION (by steaming)					

Table C-2
Percent of Bidan di Desa Who Performed Step for Infection Prevention Correctly by Training Status

		TRAINED N=33	INTERNS N=28	UNTRAINED N=47	P value
17	Puts supplies and equipment into pot when water is boiling	85%	79%	57%	0.02
18	Makes sure instruments are open and syringe/needle are separated	39%	11%	17%	0.01
19	Puts instrument tray on top with sponge forceps easily available (to pick up instruments after steaming)	36%	25%	32%	0.63
20	Covers pot	97%	86%	92%	0.28
21	Steams for 20 minutes	97%	96%	77%	0.006
22	With disinfected sponge forceps picks up instrument tray and fills tray with instruments, needle, catheter, etc	61%	86%	79%	0.06
23	Air dries instruments	52%	54%	32%	0.10
24	Covers instrument tray after instruments dried	82%	89%	89%	0.56
25	With disinfected sponge forceps picks up gloves and hangs them up for drying	61%	57%	68%	0.60
26	Air dries gloves	73%	50%	38%	0.01
27	Stores gloves in disinfected, covered container	79%	89%	77%	0.39

Table C-3
Percent of Bidan di Desa Who Performed Step for Manual Removal of Placenta Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
EXPLAINS TO MOTHER AND FAMILY					
1	Placenta is still attached and Ibu Cahaya is bleeding too much	100%	93%	94%	0.31
2	What she will do	100%	89%	94%	0.18
3	That it hurts but she will finish as quickly and with as little pain as possible	97%	68%	53%	<0.001
STEPS FOR MANUAL REMOVAL OF THE PLACENTA					
4	Rubs uterus to make it contract	79%	64%	38%	<0.001
5	Shows family how to rub uterus	46%	21%	9%	<0.001
6	Gives 1 ampule oxytocin IM	91%	68%	53%	0.002
7	Empties bladder (if necessary)	100%	89%	70%	0.001
8	Decides if she has time to start IV (if bleeding too heavy she needs to get the placenta out quickly)	94%	79%	70%	0.03
9	Tries to deliver placenta normally	67%	39%	23%	0.001
10	Gives Valium or other medication for pain, if available	73%	61%	19%	<0.001
11	Rinses gloves in decontamination solution OR puts on a clean pair of decontaminated gloves	100%	86%	83%	0.05
12	Holds umbilical cord with one hand	91%	68%	51%	<0.001
13	With the other hand, inserts it into the vagina following it up the cord	97%	71%	47%	<0.001
14	Finds the edge of the placenta that has separated	97%	71%	47%	<0.001
15	Lets go of the umbilical cord	88%	64%	40%	<0.001
16	With the same hand that held the umbilical cord, steadies the uterus through the abdomen	88%	64%	40%	<0.001
17	Separates placenta with slicing motion	88%	64%	45%	0.001
18	When placenta is separated, rubs the uterus to make it contract	88%	54%	30%	<0.001

Table C-3

Percent of Bidan di Desa Who Performed Step for Manual Removal of Placenta Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
19	Removes placenta and membranes slowly DURING a contraction	85%	43%	21%	<0.001
20	Keeps external hand on uterus while removing placenta	85%	54%	28%	<0.001
21	As placenta delivers, uses both hands to twist placenta	82%	54%	34%	<0.001
22	Rubs uterus after delivery of placenta	82%	43%	17%	<0.001
23	Checks placenta for completeness	100%	93%	75%	0.002
CARE TO MOTHER IMMEDIATELY AFTER MANUAL REMOVAL					
24	If IV not started earlier, starts here and adds oxytocin	88%	64%	57%	0.01
25	Runs IV quickly	79%	43%	43%	0.002
26	If oxytocin not effective in contracting uterus, gives 1 ampule methergine IM (if no hypertension)	85%	54%	23%	<0.001
27	Estimates blood loss	88%	54%	26%	<0.001
28	Monitors vital signs and bleeding (every 15 minutes for 1 hour and then every 30 minutes for 2 more hours)	97%	68%	45%	<0.001
29	Makes mother comfortable (fluids, position, hygiene)	88%	61%	45%	<0.001
30	Puts baby to breast	100%	71%	51%	<0.001
31	Records findings	94%	39%	23%	<0.001

Table C-4

Percent of Bidan di Desa Who Performed Step for Bimanual Compression Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
EXPLAINS TO MOTHER AND FAMILY					
1	Ibu Cahaya is bleeding too much	49%	21%	34%	0.09
2	She must rub the uterus to stop the bleeding	27%	11%	21%	0.27
3	That it hurts but she will finish as quickly and with as little pain as possible	9%	11%	6%	0.79
STEPS BEFORE EXTERNAL, BIMANUAL COMPRESSION					
4	Rubs uterus to make it contract	15%	11%	0%	0.03
5	Shows family how to rub uterus	6%	4%	2%	0.66
6	If there is time start IV or ask assistant to start IV	3%	4%	2%	0.93
7	Gives 1 ampule oxytocin IM or IV	27%	21%	4%	0.01
8	Empties bladder (if necessary)	46%	21%	11%	0.002
STEPS FOR EXTERNAL, BIMANUAL COMPRESSION					
9	Places one hand on the abdomen at the top of the uterus	3%	0%	2%	0.67
10	Places the other hand on the abdomen at the bottom of the uterus	3%	0%	2%	0.67
11	Presses hands together firmly and makes sure uterus is between pressed hands	3%	0%	2%	0.67
12	Looks to see if bleeding has slowed or stopped	0%	0%	2%	0.52
STEPS FOR INTERNAL, BIMANUAL COMPRESSION					
13	Rinses gloves in decontamination solution OR puts on a clean pair of decontaminated gloves	3%	4%	2%	0.93
14	Again explains to Ibu Cahaya what she must do	12%	7%	0%	0.06
15	Places examining hand into the vagina	12%	0%	2%	0.04
16	Uses care to move flabby cervix out of the way	9%	0%	0%	0.03

Table C-4
Percent of Bidan di Desa Who Performed Step for Bimanual Compression Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
17	Makes hand in vagina into a fist	12%	4%	2%	0.14
18	Presses fist firmly against the lower part of the uterus	12%	4%	2%	0.14
19	Places other hand on abdomen on top and behind uterus	12%	0%	2%	0.04
20	Presses abdominal hand and vaginal fist together so the uterus is squeezed between the two	12%	7%	2%	0.20
21	Holds firmly	12%	7%	2%	0.20
22	Observes if uterus contracts and bleeding stops	12%	7%	2%	0.20
23	If uterus still soft and bleeding continues opens fist and with fingers massages lower part of uterus around the cervix until uterus gets hard	12%	7%	2%	0.20
24	Does internal compression again to make sure bleeding has stopped	12%	7%	2%	0.20
CARE TO MOTHER IMMEDIATELY AFTER BIMANUAL COMPRESSION					
25	If IV not started earlier, starts here and adds oxytocin	9%	7%	0%	0.12
26	Runs IV quickly	3%	4%	0%	0.45
27	If oxytocin not effective in contracting uterus, gives 1 ampule methergine IM (if no hypertension)	6%	7%	2%	0.54
28	Estimates blood loss	6%	4%	0%	0.26
29	Monitors vital signs and bleeding (every 15 minutes for 1 hour and then every 30 minutes for 2 more hours)	9%	7%	0%	0.12
30	Makes mother comfortable (fluids, position, hygiene)	12%	11%	2%	0.18
31	Puts baby to breast	6%	7%	2%	0.54
32	Records findings	6%	4%	0%	0.26

Table C-5

Percent of Bidan di Desa Who Performed Step for Neonatal Resuscitation Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
FULL BREATHING AND HEART RESUSCITATION					
1	Dries the baby	82%	86%	57%	0.01
2	Removes the wet cloth used to dry the baby	82%	75%	57%	0.05
3	Keeps the baby warm by wrapping with a dry cloth loosely	88%	86%	70%	0.10
4	Positions the baby (puts into the 'sniffing' position)	88%	86%	66%	0.03
5	Suctions the baby with the Slime Trap (DeLee)	85%	86%	53%	0.001
6	Stimulates the baby by rubbing her hand up and down the baby's spine	55%	39%	13%	<0.001
7	Checks (counts) breathing and heart rate	24%	11%	4%	0.03
8	Wipes the baby s face (uses gauze with chlorine solution, then gauze with soap and water solution, then gauze with clear water)	30%	29%	6%	0.01
9	Breathes 1x for the baby	58%	50%	11%	<0.001
10	Checks to see if chest rises	55%	57%	11%	<0.001
11	No so she positions head again and suctions again	27%	18%	9%	0.08
12	Starts full breathing and heart resuscitation: Does 3 cycles (1 cycle = 1 breath + 5 chest compressions)	67%	21%	4%	<0.001
13	Correctly positions fingers for chest compression (uses index and middle finger on the center of the baby's chest just below the nipple line)	52%	14%	6%	<0.001
14	Correctly compresses baby's chest 1 - 2 cm	58%	21%	4%	<0.001
15	Correctly covers the baby's mouth and nose with her mouth when she breathes into the baby	67%	21%	11%	<0.001
16	Re checks (counts) breathing and heart rate	30%	29%	2%	0.001
BREATHING RESUSCITATION ONLY					

Table C-5
Percent of Bidan di Desa Who Performed Step for Neonatal Resuscitation Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
17	Breathes for the baby 5x (1 cycle)	18%	18%	6%	0.20
18	Rechecks (counts) breathing and heart rate	12%	7%	0%	0.06
STIMULATION AND WARMTH SUPPORT ONLY					
19	Stimulates the baby by rubbing her hand up and down the baby's spine	0%	0%	0%	1.00
20	Keeps the baby warm either by 1) wrapping a dry cloth around the baby, or 2) puts the baby skin-to-skin with the mother and covers both of them	3%	0%	0%	0.32
21	Continues to recheck (count) breathing and heart rate	0%	0%	0%	1.00

Table C-6
Percent of Bidan di Desa Who Complete and Interpret the Partograph Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
COMPLETES (FILLS OUT)					
1	Cervical dilatation	64%	46%	36%	0.05
2	Descent of the head	61%	46%	34%	0.06
3	Fetal heart rate	85%	75%	66%	0.16
4	Status of membranes color of amniotic fluid	100%	86%	57%	<0.001
5	Molding of head	94%	79%	70%	0.03
6	Frequency and duration of contractions	79%	68%	55%	0.09
7	Maternal blood pressure	94%	89%	83%	0.32
8	Maternal pulse	88%	89%	77%	0.25
9	Maternal temperature	97%	89%	85%	0.22
10	Urine (amount, color, protein)	97%	89%	85%	0.22
INTERPRETATION AND MANAGEMENT OF PARTOGRAM					
41	Length of latent phase: 4 hours	79%	86%	66%	0.13
42	Length of active phase: 6 hours	73%	71%	62%	0.51
43	Frequency of FHR checks after 1000: every 30 minutes	76%	89%	79%	0.38
44	Reason for #43: Partograph protocol/guidelines state that FHR should be checked every 30 minutes in Stage I Labor	24%	36%	21%	0.37
45	Frequency of FHR checks after 1600: every 15 minutes	85%	82%	62%	0.04
46 A	Reasons for #45: FHR is above 160 (it is 168)	64%	79%	57%	0.18
46 B	Meconium in the amniotic fluid (Another acceptable answer - mom's temperature is 37.6 °)	67%	46%	32%	0.01

Table C-6

Percent of Bidan di Desa Who Complete and Interpret the Partograph Correctly by Training Status

		TRAINED N=33	INTERN N=28	UNTRAINED N=47	P value
47	Reason for vaginal exam in 2 hours at 1600 Because if Ibu Theresia s labor progress is normal, she should dilate at least 1 cm per hour and be completely dilated by 1600 So Ibu Lisani checked to make sure her labor progress was normal (and to encourage her to begin pushing as soon as the cervix is completely open)	18%	18%	45%	0.01
48	Time and reason for concern at hydration level At 1400 when she only urinated 100 cc, it was dark yellow, and her temperature rose to 37 4 C	49%	61%	51%	0.60
49 A	How dehydration affects mom It can cause the mother s uterus to work less effectively (poorer contractions)	55%	50%	72%	0.10
49 B	It can cause the mother s temperature to rise (Another acceptable answer - it can make the mother more tired)	73%	71%	53%	0.13
50	How dehydration affects baby It can increase the baby s heart rate	73%	82%	75%	0.66
51 A	Yes, needs referral	88%	96%	92%	0.48
51 B	1600 (time)	79%	89%	72%	0.22
51 C-1	Reason #1 for referral: Went over the alert line (No cervical dilatation in 2 hours)	27%	39%	34%	0.61
51 C-2	Reason #2 for referral: Meconium in the amniotic fluid	67%	50%	45%	0.14
51 C-3	Reason #2 for referral: Fetal heart rate is above 160 (Another acceptable answer - the mother has a high temperature)	64%	82%	51%	0.03