HOKKAIDO UNIVERSITY

Title	Quality of partogram monitoring at a primary health centre in Zambia
Author(s)	Fujita, Wakako; Mukumbuta, Lubinda; Chavuma, Roy et al.
Citation	Midwifery, 31(1), 191-196 https://doi.org/10.1016/j.midw.2014.08.008
Issue Date	2015-01
Doc URL	https://hdl.handle.net/2115/57914
Type	journal article
File Information	Midwifery_31(1)_191-196.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

Title

Quality of partogram monitoring at a primary health centre in Zambia

Authors

Wakako Fujita, RNM, MA (Registered Nurse Midwife)[a]
Lubinda MUkumbuta, RNM (Registered Nurse Midwife)[b]
Roy Chavuma, MD, MPH (Medical Doctor)[c]
Kazutomo Ohashi, MD, PhD (Medical Doctor)[d]

a Hokkaido University, Faculty of Health Sciences, Hokkaido, Japan
b Railway Hospital, Lusaka, Zambia
c University Teaching Hospital Zambia, Lusaka, Zambia
d Osaka University Graduate School of Medicine, Osaka, Japan

Abstract

Background: the World Health Organization (WHO) recommends using a partogram to reduce maternal and neonatal mortality, especially in developing countries. Some previous studies conducted in African countries suggested that appropriate use of a partogram with standardised monitoring was associated with good labour outcomes. However, the compliance rates of recording differed among the monitoring items on the partogram and the quality of monitoring has not been examined adequately.

Objective: to examine the compliance for each monitoring item on the WHO partogram and the quality of the monitoring.

Design: a retrospective and observation study.

Methods: a retrospective review of partograms (n=200) was undertaken in a health center in Lusaka, Zambia. We excluded referral cases, admission with full dilatation, birth before arrival, delivery within 30 minutes, and false labor. Finally, 125 partograms were examined to assess the recording compliance for each monitoring item. An observation study in the delivery room and interviews with midwives were also conducted to examine the quality of monitoring for labor. The research ethics committee of the Division of Health Sciences, Osaka University Graduate School of Medicine and the Biomedical Research Ethics Committee of the University of Zambia approved the study.

Findings: the lowest recording rate of the frequency of uterine contractions at the time of admission was 69.6%. The highest compliance rates in the active phase were found

for the descent of the fetal head and cervix dilatation at 97.6% and 97.3%, respectively. The lowest rate was found for the mother's pulse rate at 25.5%, whereas 27.1% of women admitted in the latent phase were diagnosed as entering the active phase in the acceleration phase. In addition, the methods of abdominal palpation for assessing uterine contractions and intermittent fetal heart rate monitoring were not appropriate.
Key conclusions and implications: Zambian midwives have acquired sufficient understanding regarding the usefulness of the WHO partogram. However, there were differences in the compliance rates for each monitoring item due to a lack of medical devices and inappropriate monitoring skill. To improve labour outcomes with the WHO partogram, it is necessary to improve the recording and compliance rates for each monitoring item, as well as to upgrade the quality of monitoring.

Keywords: Partogram, Zambia, Compliance, Monitoring of Labour, Quality

Introduction

The World Health Organization (WHO) recommends using a partogram to reduce maternal and neonatal mortality, especially in developing countries (WHO,1994; Mathai, 2009). A prospective multicentre study was conducted to examine the relationship between the use of the WHO partogram and labour outcomes using 35,484 cases in South Asian countries, indicating that appropriate intervention following abnormal findings on a partogram could reduce the rates of prolonged labour, augmented labour, emergent caesarean section and intra-partum stillbirth (WHO, 1994). On the other hand, the systematic review described by Lavender et al. (2012) reported that there was no evidence of any difference in the rate of caesarean section, instrumental vaginal delivery, or Apgar score less than seven at five minutes after birth between the partogram and no partogram.

In African countries, some retrospective studies concerning the relationship between use of a partogram and labour outcomes have been conducted. It was reported from four public hospitals in Tanzania that substandard monitoring of fetal heart rates (FHRs) was strongly associated with poor birth outcome (Apgar score < 7 and stillbirth) compared with cases that used standard monitoring (Nyamtema et al., 2008). In a tertiary hospital in Ghana, adequate use of a partogram was associated with a lower level of maternal blood loss and fewer neonatal injuries (Gans-Lartey et al., 2013). These studies suggested that appropriate use of a partogram with standardised monitoring was

associated with good labour outcomes in African countries.

On the other hand, some previous studies indicated that the quality of recording on the partogram was inadequate, and that the recording compliance rates differed among monitoring items on the partogram in African countries. A study in Uganda reported that 69.9% of cases used the WHO partogram, and the recording compliance rate differed among the monitoring items: from 75.5% in dilatation of the cervix to 18.8% in blood pressure (Ogwang et al., 2009). The study in Ghana described above reported that only 25.6% of partograms were adequately completed, whereas the highest compliance rate was found for dilatation of the cervix (95.3%). The item with the lowest compliance rate was fetal heart rate (6.6%) (Gans-Lartey et al., 2013). However, these studies examined only the rate of recording and did not assess the quality of monitoring for each item. Monitoring devices used in developing countries are simple and basic. For example, fetal heart rate was intermittently monitored with a Pinard's fetal stethoscope and uterine contractions were assessed by palpation. Under such conditions in resource-limited countries, it may be difficult to assure the quality of monitoring for each item that should be documented on a partogram.

To clarify the quality of labour monitoring on the documentation of the WHO partogram, we first examined the recording compliance for each monitoring item on a partogram retrospectively at a health centre in Lusaka, Zambia. We used two dependent variables to measure recording compliance: the rate of recording at the time of admission and the compliance rate in the active phase. Secondly, we directly observed labour and examined the quality of monitoring of each item on a partogram in a clinical setting.

Methods

Study design

A retrospective document review and an observation study were used to examine the quality of monitoring of labour at a public health institution in Lusaka.

Study setting

The study was carried out at a health centre in the Kalingalinga compound, Lusaka, Zambia. Its catchment population was approximately 40,000. This centre dealt with 1370 cases of labour and referred 446 mothers and 21 neonates to hospitals in 2011. The main reasons for referral cases among mothers were prolonged labour in the first stage in 63, premature labour in 46, pre-eclampsia in 42, elevated blood pressure in 38,

and cephalopelvic disproportion in 37. A woman who had given birth four or more times was defined as grand multipara and was immediately referred to a tertiary hospital. They experienced 17 stillbirths, i.e., macerated stillbirth in 12, fresh stillbirth in three and neonatal death in two. The main causes of the macerated stillbirths were premature birth. The causes of the three fresh stillbirths were premature birth (31 weeks), twin birth and birth before arrival. The causes of the two neonatal deaths were premature births (24th week with Apgar 2 and 31st week with Apgar 5).

Study 1: Rate of recording on a partogram

Sampling

Before data collection, we determined the sample size based on the data in 2011. The number of childbirths in 2011 was 1370 and that per month was assumed at about 110. All staff midwives were included equally in the monthly shift duties. Therefore, we considered that 110 partograms were sufficient samples to determine the compliance rate as performed by all staff midwives. We requested an investigation of 200 partograms from the chief nurse and the ethical committee, and received their permission.

Tool

The partogram generally used in Zambia is a piece of paper preprinted on both sides. Midwives record monitoring findings and their assessment at the time of admission in the upper part of the front page. The lower part is used as a delivery record including time of delivery, a baby's weight and volume of blood loss at birth. The back page has the WHO partogram for monitoring in the active phase of labour. The items of the WHO partogram and the monitoring interval are shown in Table 1. Plotting on the partogram begins in the active phase when the cervix is 4 cm dilated.

Data collection

We collected 200 partograms documented from May to July 2012, and excluded 75 partograms according to the following exclusion criteria: referral to tertiary hospital in 23, admission with a fully dilated uterine cervix in 17, birth before arrival in 13, childbirth within 30 minutes after admission in 10, unclear documentation in seven, and false labour in five. Finally, 125 partograms were analysed.

Data analysis

Table 1 shows 13 recording items at the time of admission, 10 monitoring items during the active phase of labour and monitoring interval indicated by the WHO guideline. We excluded albuminuria, which was examined for only in high-risk mothers because of the shortage of reagents. The recording rate of 12 monitoring items at the time of admission was examined regardless of whether the column was documented or not. In the active phase, rupture of membrane and condition of amniotic fluid are recorded in the same column as ‘C’ for clear, ‘B’ for blood-stained, ‘M’ for meconium-stained and ‘I’ for intact (not ruptured). Also, the frequency and strength of uterine contractions are recorded in the same section as the number of squares and the shade of colour. Then, the compliance rate of the nine monitoring items in the active phase was examined. Firstly, the desirable number of recordings was calculated as follows: the active phase time on the partogram was divided by the monitoring interval in the WHO protocol and the first decimal place was rounded up. Secondly, the compliance rate was calculated as follows: the number actually recorded was divided by the desirable number of recordings. We showed the mean value of the compliance rate of each item among the 125 partograms.

We also examined the starting time of documentation on a partogram for women admitted in the latent phase of labour. When a pregnant woman was hospitalised in the latent phase of labour (less than 4 cm of cervical dilatation), the WHO guideline recommends that monitoring should be started after the active phase of labour begins. Therefore, as an additional study, we examined the first recording of dilatation of the cervix on a partogram for women admitted in the latent phase to clarify whether or not the monitoring and recording on the partogram were started at the appropriate time.

Study 2: Observation study

We conducted an observation study to examine the quality of monitoring provided during the active phase from the 3 to 16 August, 2012. A morning shift (from 7:30 AM to 1:30 PM), an afternoon shift (from 1:30 PM to 6:00 PM), and a night shift (from 6:00 PM to 7:30 AM) were included, and two midwives were assigned to each shift.

Sampling

We asked 10 midwives working at the maternity ward in this health centre to participate in the study after obtaining written informed consent. All midwives agreed to participate in an observation study and an interview. The working experience as a

midwife ranged from 3.5 to 41.0 years and all midwives were experienced staff midwives.

Data collection

We conducted a time study with a continuous observation method (Kasahara et al., 2004, 2010). Two researchers (a Japanese midwife and a Zambian midwife) accompanied midwives in the labour ward and recorded their monitoring and care of women in labour using a field note. We timed the midwives' working time in the following eight categories, i.e., childbirth assistance, recording, fetal heart rate monitoring, vaginal examination, abdominal palpation, measurement of mother's vital signs, explanations, and direct care such as supporting water/food intake and comfortable positioning. We excluded non-midwifery practices such as giving medicine or organising sanitary supplies.

After the observation study, we interviewed these midwives with a semi-structured interview method. Questions were as follows: difficulties when using the partogram and how to handle such difficulties, difficulties monitoring labour and how to handle them, and crucial points to improve the quality of labour monitoring and recording on the partogram. We used English for the interviews and recorded each with an IC recorder.

Data analysis

We calculated time allocation of eight categories of midwives' work to understand their workload using the time study method. All recorded conversations in interviews were transcribed verbatim and analysed as qualitative data.

Ethical considerations

This study was approved by the research ethics committee of the Division of Health Sciences, Osaka University Graduate School of Medicine (No. 201) and the Biomedical Research Ethics Committee of the University of Zambia (No. FWA00000338). Informed consent for the observation study and interview were handed to midwives working in a labour ward. We also obtained consent from the women in labour, to accompany the midwives, after explaining the study.

Findings

The mean period of time from admission to delivery was 4˚53' (35' to 15˚05') and

that for recording on the partogram was 2 ˚56’ (12’ to 12 ˚50’). Women in the latent phase were not monitored and recorded on the partogram until the active phase started; therefore, the time from admission to delivery and those for recording on the partogram were not the same. At the time of admission, 77 women (61.6%) were in the active phase and 48 (38.4%) were in the latent phase.

Rate of documentation on the partogram

We examined the recording rates of twelve monitoring items on 125 partograms at the time of admission (Table 2). The recording rates of the gestational week and dilatation of the cervix were 100%, whereas that for the frequency of uterine contractions was 69.6%.

Table 3 shows the compliance rates for each monitoring item in the active phase according to the WHO partogram guidelines. The highest compliance rates were found for the descent of the fetal head and dilatation of the cervix at 97.6% and 97.3%, respectively. The lowest compliance rate was found for the mothers’ pulse rate at 25.5%.

Table 4 shows the dilatation of the cervix at the starting time of recording on the partogram for women admitted in the latent phase. Thirteen mothers (27.1%) were diagnosed as entering the active phase after the cervix opened to more than 8 cm, which is in fact in the acceleration phase.

Quality of each monitoring item on the partogram

Observation studies were conducted seven times (two times in the morning shift, three times in the afternoon shift, two times in the night shift). We observed eight midwives (two registered midwives and six enrolled midwives) out of a total of 10 midwives.

Fetal heart rate (FHR)

We observed FHR monitoring 27 times. The mean time required in the first stage was 19 seconds (4-60 seconds). Midwives auscultated fetal heart sounds with a stethoscope made with aluminium, but did not measure FHR using a wristwatch or a stopwatch. Only one registered midwife measured FHR using the second hand of a clock on the wall. The FHR was monitored in the intermittent phases of uterine contractions and was not monitored during the second stage in any cases. In the

interview with midwives, they mentioned the following reasons: the baby's head was too descended to auscultate the fetal heart sound, and it would be physically impossible to press a stethoscope against a woman's abdomen while she was enduring maximum pain.

Vaginal examination

We observed vaginal examination 13 times. The mean time required was 46 seconds (15-80 seconds). Midwives used disposable gloves when they did vaginal examinations, and four midwives said that the number of vaginal examinations should be as low as possible to prevent women in labour from infections. Midwives gave women an explanation before a vaginal examination in all cases. They tried to protect the mothers' privacy by using a curtain.

Uterine contractions (abdominal palpation)

We observed abdominal palpation 21 times. The mean time required was 48 seconds (10-118 seconds). Abdominal palpation was hardly done to assess uterine contractions, and actually was mainly performed to assess the baby's presentation and position, estimating the baby's size and checking the descent of the fetal head. Some midwives mentioned that they had assessed the uterine contractions by observing women in labour or feeling them during a vaginal examination. The WHO recommends the monitoring of uterine contractions for 10 minutes and the duration of contractions should be recorded at one of three levels, weak (less than 20 seconds), medium (20-40 seconds), and strong (more than 40 seconds). The monitoring interval is also recommended to be every 30 minutes, but midwives actually did not monitor them using a watch. Some midwives recorded all the findings on the partogram later or filled them in after the labour was completed.

Mother's vital signs

A digital clinical thermometer was used to measure body temperature at the armpit. An aneroid-type BP manometer was used for BP monitoring, but the needles of the manometers were sometimes not calibrated. In interviews, most midwives considered blood pressure to be the most important item for early detection of pre-eclampsia and eclampsia. Pulse rate was not measured accurately because midwives did not use a wristwatch or a stopwatch.

Time allocation of midwifery workload

Analysing the time allocation of the midwifery workload found the following: working time for childbirth assistance (11%), recording (35%), explanations (20%) and direct care (19%). The time allocation for monitoring labour accounted for 15%, including FHR monitoring at 2%, vaginal examination at 2%, abdominal palpation at 3%, and measurement of mother's vital signs at 8%.

Discussion

The present study revealed that there were wide variations regarding the compliance with each monitoring item in the WHO partogram. Also, it was revealed that the monitoring method was not appropriate, especially for uterine contractions and fetal heart rate.

The lowest recording rate at the time of admission was for the uterine contractions (69.6%). The uterine contractions were assessed by history taking and observation. The midwives asked 'how far apart are your contractions?' or 'how strong are your contractions?' However, some pregnant women could not understand the meaning of these questions clearly. According to our preliminary study in 2012 at the same health centre, the first reason for referral of cases was a prolonged first stage of labor. The WHO defines prolonged labor as follows "A prolonged active phase of labor means that a labor lasts over 12 hours with painful contractions in the active phase" (WHO, 2008). However, it can be difficult to accurately assess the onset of regular uterine contractions with a low recording rate of uterine contractions and such inaccurate determination could increase the number of unnecessary referral cases in this center. As suggested by the WHO guidelines, the length and intervals of contractions should be determined by palpation using a watch with a second hand. Although the compliance rate of uterine contractions was higher when compared with other African countries, the quality of monitoring still needs to be improved.

Among monitoring items in the active phase, dilation of the cervix and descent of the fetal head showed the highest compliance rate as also reported by Gans-Lartey (in Ghana, 2013), Ogwang (in Uganda, 2009) and Nyamtema (in Tanzania, 2008). These items were the most important as described in the WHO guideline, and the monitoring intervals were not frequent (at least once every four hours). Although the mother's pulse rate showed the lowest compliance rate (25.5%) as reported by Gans-Lartey (2013) (10.5%), the FHR showed a high compliance rate (82.6%), despite the same monitoring interval (every 30 minutes). These results indicated that midwives might not perceive the need for such frequent measurement of the mother's heart rate. Moreover, we found some problems concerning the quality of FHR monitoring. Intermittent FHR monitoring

is defined in some guidelines as maintaining the same quality as continuous monitoring. The American College of Nurse-Midwives recommends a multiple-count method (count the FHR for 5-15 seconds ‘several times’ to check for acceleration and deceleration), (The American College of Nurse-midwives, 2010). The Japan Midwives Association recommends that FHR monitoring should be done for at least one minute immediately after a uterine contraction (Japan Midwives Association, 2009). In our observation study, these monitoring methods were not done and the mean time required for FHR monitoring was only 19 seconds. Moreover, the FHR monitoring was not always performed during the second stage of labour, resulting in a poor assessment of fetal well-being. Some midwives explained the difficulties in FHR monitoring with a standard stethoscope, as described in the results section. We considered a Doppler stethoscope better and more convenient both for midwives and women in labour if available. Hofmeyr et al. recommended the use of a Doppler stethoscope in low-income countries, mentioning that it could identify late deceleration, reduce the perinatal mortality rate and neonatal encephalopathy (Hofmeyr et al., 2009). We consider that the use of a Doppler stethoscope would bring many advantages and upgrade the quality of monitoring in labour, especially in the second stage of labour, because of its ease of handling.

Midwives should start to monitor women who are hospitalised in the latent phase when their cervix has opened 4 cm. However, midwives did not start to monitor and record for 27.1% of these women until the cervical dilatation reached 8 cm or more, which is in the acceleration phase, indicating that there were some cases with inadequate estimation of the progress of labor in the latent phase. We considered that this occurred due to the low recording rate of uterine contractions at the time of admission, leading to midwives not being able to accurately assess the progress of labour accurately. The current studies reported that women admitted to hospital during the latent phase had higher rates of CS and obstetric interventions, especially among prime-parae cases(Lundgren, et al., 2013; Rahnama, et al., 2006). These studies suggest the difficulty in defining the onset and progress of the latent phase, even in settings where electric monitoring is available. In our study setting, we found inadequate monitoring in the latent phase and a comprehensive assessment of labour progress was lacking. We recommend that midwives in Zambia should improve the compliance and accuracy of uterine contraction monitoring to provide adequate childbirth care with appropriate timing.

To improve labour outcomes by using the partogram, we first need enough time and understanding to document it. The primary health centre used in this study had

enough midwives who had acquired sufficient understanding regarding the usefulness of the partogram. Even in this setting, there were differences in the compliance rate for each monitoring item. Additionally, it is necessary to improve the accuracy of FHR monitoring and uterine contractions. As a next step, midwives should improve the compliance rates for each monitoring item separately, as well as the quality of monitoring itself. To achieve these goals, adequate monitoring skills and devices are needed to estimate the progress of labour for each individual woman. We summarised the key points in implementing effective use of the partogram in Table 5.

Limitations

There are some limitations to this study. Firstly, we used a convenient sampling of partograms documented from May to July 2012. These partograms were kept on a shelf in the staff room and most were not filed in an orderly way. Therefore, we could not determine the quality of sampling. Secondly, the presence of a researcher in the observation study possibly caused the midwives' to behave in an untypical manner. To minimise these biases, we tried to build a sense of rapport between the researchers and the midwives in a preliminary study, and explained that the aim of this study was not to evaluate their skills, but to improve them. Finally, we did not determine the relationship between the quality of monitoring and labour outcomes, including inadequate referral cases. Further studies should be designed to examine whether or not upgrading the quality of monitoring in first-level medical facilities can reduce unnecessary referral cases and improve the outcomes of labour.

Conclusion

We conducted a retrospective study of 125 documented partograms and an observation study at a health centre in Lusaka, Zambia. We examined the recording rate at the time of admission, the partogram compliance rate in the active phase, and examined the quality of monitoring for each monitoring item. There were differences in these rates among each monitoring item. The lowest recording rate at the time of admission was found for uterine contractions at 69.6% and the lowest compliance rate was for the mothers' pulse at 25.5%. Among mothers hospitalised in the latent phase, 27.1% of midwives started partogram documentation when the progress of labour entered the acceleration phase. Abdominal palpation to assess uterine contractions and FHR monitoring were not appropriate. To verify and report the monitoring items of the

partogram in line with WHO recommendations, it is necessary to improve the midwives' skills related to recording and compliance rate for all monitoring items, and to upgrade the quality of monitoring.

Conflict of interest statement

None of the authors have any conflict of interest.

Acknowledgements

We are deeply grateful to Ms. Priscilla Likwasi, Ms. Iku Ozeki and Mr. Ippei Matsuhisa in JICA (Japan International Cooperation Agency) Zambia for their kind support to obtain research permission in Zambia. We would like to express our gratitude to INFJ (International Nursing Foundation in Japan), UNZAREC (University of Zambia Biomedical Research Ethical Committee) and Lusaka District Health Office. Our deepest appreciation goes to the midwives in Kalingalinga Health Center for their co-operation and understanding in this study.

References

Gans-Lartey, F., O'Brien, B. A., Gyekye, F. O., Schopflocher, D., The relationship between the use of the partograph and birth outcomes at Korle-Bu teaching hospital. Midwifery 29, 2013, 461-467.

Hofmeyr, G.J., Haws, R.A., Bergstorm, S. ,et al., Obstetric care in low-resource settings: what, who, and how to overcome challenges to scale up?. International Journal of Gynecology and Obstetrics 107, 21-45.

Japanese Midwives Association, 2009. Guideline of Maternity Home. 2009 Revised edition(in Japanese).

Kasahara, S., Ishii, A., Numasaki, H., et al., Implemention of time and motion study. In: Introduction to Time and Motion Study in Health Care Service, The Japanese journal of Nursing Research 37, 2004, 309-317, (in Japanese).

Kasahara, S., Ohno, Y., Ishii, F., Numasaki, H., Visualizing the impact of interruptions in nursing work flow using a time process study. IT Health Care 5, 2010, 124-134.

Lavender, T., Hart, A., Smyth, R.M., 2012. Effect of partogram use on outcomes for women in spontaneous labour at term. Cochrane Database Systematic Review 8, CD005461.

Lundgren, I., Andrén, K., Nissen, E., & Berg, M. Care seeking during the latent phase of labour – frequencies and birth outcomes in two delivery wards in Sweden. Sexual & Reproductive Healthcare, 4, 2013, 141-146.

Mathai, M., The partograph for the prevention of obstructed labor. Clinical Obstetrics and Gynecology 52, 2009, 256-269.

Nyamtema, A. S., Urassa, D.P., Massawe, S., Massawe, A., Lindmark, G., van Roosmalen, J.,
Partogram use in the Dar es Salaam perinatal care study. International Journal of Gynecology and Obstetrics 100, 2008, 37-40.

Ogwang, S., Karyabakabo, Z., Rutebemberwa, E., Assessment of partogram use during labour in Rujumbura Health Sub District, Rukungiri District, Uganda. African Health Sciences 9, 2009, 27-34.

Rahnama, P., Ziaei, S., & Faghihzadeh, S., Impact of early admission in labor on method of delivery. International Journal of Gynecology & Obstetrics, 92, 2006, 217-220.

The American College of Nurse-Midwives., Intermittent auscultation for intrapartum fetal heart rate surveillance. Journal of Midwifery and Womens Health 55, 2010, 397-403.

World Health Organization, World Health Organization partograph in management of labour. The Lancet 343, 1994, 1399-1404.

World Health Organization, 2008. Midwifery education modules, (Managing Prolonged and Obstructed Labour) 2nd edn.,2008, Geneva, WHO Press; Geneva.
<http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/3_9241546662/en/index.html>
(last accessed 25 June 2014).

Table 1 Recording items and monitoring interval indicated by the WHO guidelines

Items	At admission	In the active phase	Monitoring interval
Gestational week	yes	no	
Mother’s vital signs			
Body temperature	yes	yes	2 hours
Pulse rate	yes	yes	30 minutes
Blood pressure	yes	yes	4 hours
Respiration rate	yes	no	
Vaginal examination			At least 4 hours
Dilatation of cervix	yes	yes	
Descent of fetal head	yes	yes	
Molding of fetal skull bones	no	yes	
Rupture of membrane	yes	yes	
Condition of amniotic fluid	yes		
Uterine contraction			30 minutes
Frequency	yes	yes	
Strength	yes		
Fetal heart rate (FHR)	yes	yes	30 minutes
Albuminuria	yes	yes	2-4 hours

Table 2 Recording rate of monitoring items on 125 partograms at the time of admission

Items	Number of recordings	
	n	%
Gestational week	125	100.0
Mother’s vital signs		
Body temperature	117	93.6
Pulse rate	107	85.6
Blood pressure	121	96.8
Respiration rate	115	92.0
Vaginal examination		
Dilatation of cervix	125	100.0
Descent of fetal head	118	94.4
Rupture of membrane	103	82.4
Condition of amniotic fluid	120	96.0
Uterine contraction		
Frequency	87	69.6
Strength	107	85.6
Fetal heart rate	117	93.6

Table 3 Compliance rate of monitoring items on 125 partograms in the active phase of labour

Items	Compliance rate %	
	Mean	SD
Mother’s vital signs		
Body temperature	59.1	44.9
Pulse rate	25.5	33.1
Blood pressure	93.7	22.7
Vaginal examination		
Dilatation of cervix	97.3	12.8
Descent of fetal head	97.6	10.7
Molding of fetal skull bones	56.7	46.5
Condition of amniotic fluid	65.0	45.6
Uterine contraction		
Frequency & Strength	91.8	21.9
Fetal heart rate	82.6	26.2

Table 4 Dilatation of cervix at the starting time of recording on partograms for mothers admitted in the latent phase (n=48)

Dilatation cm	n	%
Active phase		
4	7	14.6
5	11	22.9
6	13	27.1
7	4	8.3
Acceleration phase		
8	7	14.6
9	1	2.1
10	5	10.4
	48	100.0

Table 5 Key points in implementing effective use of the WHO partogram

1. Prepare essential functioning equipment for monitoring labor in facilities of all levels
・fetal stethoscopes, sphygmomanometers, thermometer, watch with second hand, urine testing supplies
2. Strengthen competence in essential clinical midwifery skills for monitoring labor
・Intermittent FHR auscultation
・Assessment of uterine contractions by palpation
3. Allocate more time to high-quality monitoring and less to recording the partogram
4. Adequately skilled staff
5. Sufficient monitoring of women in the latent phase to estimate labor progress