ORIGINAL ARTICLE

Effect of Training on the Knowledge and Use of the Partograph for Low Risk Pregnancies among Health Workers in a Tertiary Hospital in Lagos State, Nigeria

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ABSTRACT

Background: Partogram use is important for early recognition of deviations in labour. This study assessed the effect of training on the knowledge and use of the partogram in low-risk pregnancy (LRP).

Methods: This is an analytical before and after study at the Lagos University Teaching Hospital. Fifty-two health personnel who conduct deliveries in the labour ward were assessed before and after a training on the proper utilization of the partogram which used WHO recommendations on the integrated management of pregnancy and child birth. Comparison of knowledge and utilization of the partogram before and after the training was estimated using the chi square test. The level of significance was p<0.05.

Results: Thirty-two (61.5%) of the respondents were resident doctors while 38.5% were midwives. Only 27% of them had had any formal training on partogram use in the three years preceding the intervention. Training significantly improved knowledge of the partogram by improving standard records for cervical dilatation, uterine contraction and fetal descent; reducing substandard records for uterine contraction and fetal descent and no records, (p=0.0001). Training only significantly affected the utilization of the partogram in reference to blood pressure readings. There was a significant increase in substandard records and a reduction in standard records, (p=0.001)

Conclusion: Training improved knowledge, but not the use of the partogram by health workers. Greater emphasis should be placed on the use of the partogram in monitoring labour progress in women with low risk pregnancies.

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INTRODUCTION

The partogram is a graphical representation of the events in labour. As part of the Safe Motherhood Initiative launched in 1987, the World Health Organization (WHO) has produced, promoted, modified the partogram and recommends its use in labour in order to improve labour management and reduce maternal and fetal morbidity and mortality. Partogram use in the active management of labour has been reported to reduce the occurrence of prolonged labour and need for caesarean section.[1] The partogram significantly influences decision-making and has been reported to cause positive labour

outcome among low or high-risk parturient.[2] Women whose progress of labour was slow enough to touch the alert or action line of the partogram delivered babies who were more likely to require resuscitation or delivered as stillborn, unlike women whose labour progress did not get to the alert line.[3]

Evidence from systematic reviews on the effect of partogram use on maternal and neonatal outcomes is equivocal. In a systematic review on effects of active management of labour on caesarean section in low risk women, caesarean section rates in the active management group were slightly lower and prolonged labour occurred less often than in the routine care group.[1] To the contrary, it has been shown that there is little or no difference in caesarean section and no influence on neonatal outcome when partogram use was compared to no partogram use in labour.[1] An overview of systematic reviews, including Cochrane reviews concluded that more evidence is needed on the use of partogram for normal labour.[5] Assessment of the utilization of the partogram in many low and middle-income countries has shown poor use of the tool to monitor women in labour. In Ethiopia, standard representation of cervical dilatation, fetal heart rate, maternal uterine contraction and blood pressure was observed in 32.9%, 30.7%, 20.7% and 18.6% of partograms reviewed in Addis Ababa, respectively while partogram utilization was 70.2% in Bale Zone.[6,7] Similarly, poor use of the partogram was reported in Tanzanian, Nigerian, Kenyan and Ugandan health facilities.[8-11] This made researchers in Sub-Saharan Africa to recommend in-service training to address the importance of documentation and regular partogram audit. [7, 8, 12]

In an effort to improve knowledge of the partogram, researchers in Nigeria and Ethiopia, trained health workers on the use of the partogram and subsequently evaluated their performance. They reported better utilization of the partogram after the training.[7, 13, 14] Before the training, the participants median knowledge score was higher than the median skills score (70.0% vs 51.9%). Following the training, nearly all the participants 99.7% showed an improvement in the total score.[12] Obstructed labour contributes 8% of maternal deaths.[15] Improper use of the partogram has contributed to the poor feto-maternal outcomes despite its wide spread usage, [16] and may alter the evidence that emerges from the evaluation of its use. The objectives of this study were to evaluate health workers' knowledge and utilization of the partogram for low risk pregnancies and determine the effect of training on partogram use and utilization at a tertiary health facility in Lagos State, Nigeria.

METHODOLOGY

This was an analytical before and after study carried out at the Lagos University Teaching Hospital (LUTH), Lagos State from June 2013 to April 2014. The study population comprised of all consenting health workers who attended to deliveries at the labour ward of the Lagos University Teaching Hospital. The labour ward of the Lagos University Teaching Hospital supervises an average of 180 deliveries a month, comprising of both low risk and high risk deliveries. The training part of the research was conducted at the seminar room of the labour ward complex. As at the time of this study, there were about 70 residents and 25 nurses in the Department of Obstetrics and Gynaecology. The total sample size was 52 and health workers included resident doctors and midwives.

A pre-intervention assessment of the knowledge and use of the partogram was conducted. To assess participants' knowledge, a clinical scenario of low risk pregnancy (LRP) described in "Managing complications in

Pregnancy and Childbirth a guide for doctors and midwives" a WHO document published in 2007 was used. [17] Their representation of the management in the scenario was assessed as standard, sub-standard or as having no records. Standard record indicates that the participants had an ideal representation of the clinical scenario, while substandard indicates that they had a less than ideal representation of the clinical scenario, with no records indicating no representation at all. The pre-intervention assessment of their utilization of the partogram was by retrieving and evaluating partograms of low-risk pregnancies previously managed and delivered by the participants. The use of the partogram was assessed for correct charting of cervical dilatation, uterine contractions, fetal heart rate, maternal blood pressure, temperature and pulse rate. Each parameter was categorized into standard record, substandard record or not recorded.

Criteria for standard record were cervical dilatation charted at least every 4 hours; fetal heart rate, blood pressure and temperature charted at least one hourly; Apgar score always recorded on the partogram. This was as previously done in a perinatal care study in Dar es Salaam.[8] Uterine contraction had standard documentation if charted every 30 minutes. When the parameters were charted less often than the above criteria, it was regarded as substandard and if there were no records, it was explicitly stated so. For this study, the criteria to classify a labour as low risk were spontaneous labour, cervical dilatation was ≥ 4cm - ≤ 8cm, pregnancy was ≥37 completed weeks and cephalic presentation of the fetus. The partograms of women with chronic hypertension, antepartum haemorrhage, breech presentation, multiple pregnancy, preterm labour, preeclampsia/eclampsia, labour induction and elective caesarean section were excluded from the analysis. There were 94 low risk pregnancies and 90 low risk pregnancies before and after the training, respectively.

Training was conducted using the World Health Organization (WHO) manuals on the partogram.[18] The topics treated during the training sessions included strategies to improve maternal and neonatal health; the concept of active management of labour; latent phase of labour and pain relief in labour; active phase labour and use of the partogram; oxytocin use in labour (augmentation and induction) and neonatal resuscitation. Post training evaluation was done by administering the same clinical scenario as the pre-training evaluation. The partograms used, before and after the training were retrieved and analyzed using Epi Info® statistical software version 7.1.

For this study the outcome measures were knowledge of partogram and utilization of the partogram, measured before and after the intervention. Comparison of knowledge and partogram use before and after the training was with odds ratio (OR) using Mantel-Haenszel corrected chi square. When the proportion of the expected cell count that was less than 5 was more than 20% then the Fishers exact test was used. The level of significance was $p<0.05$ at 95% confidence interval (CI). Approval for this study was obtained from the Research and Ethics Committee of the Lagos University Teaching Hospital. Individual responses were anonymous and treated with confidentiality. Participation was voluntary and respondents were free to withdraw from the survey at any point in time if they so desired.

RESULTS

Fifty-two health personnel who conduct deliveries participated in the pre-intervention phase of the study and training while 43 (82.7%) of them who were still in the labour

ward participated in the post-intervention evaluation. Nine (3 Doctors and 6 Nurses) participants were either no longer working at the labour ward or unavailable during the post-intervention evaluation.

Table 1: Socio-demographic characteristics of participants

Characteristics	Frequency (n = 52)	Percent
Age group (years)		
25-29	9	17.3
30-34	17	32.7
35-39	8	15.4
≥ 40	18	34.6
Sex		
Female	33	63.5
Male	19	36.5
Duration of obstetric practice (years)		
1-5	9	17.3
6-10	33	63.5
≥ 11	10	19.2
Cadre		
Resident doctor	32	61.5
Midwives	20	38.5

The socio-demographic characteristics of the participants in the pre-intervention phase, is shown in Table 1. Most 32 (61.5%) participants were resident doctors while midwives made up 20 (38.5%) of participants. The participants' mean age was 37.6±8.5 years. There were 33 (63.5%) females and 19 (36.5%) male participants. Participating doctors had been in training for 1-5 years; median 2.18 years. The midwives completed their midwifery training 3-36 years with a median of 18 years. Participants personally supervised the labour of 2-25 women with a median of 8 deliveries in a week. Most participants 38 (73%) had no formal training on labour management in the three years preceding the intervention.

The analysis of participants' knowledge based on the representation of the clinical scenario is shown in Table 2. There was an increase in the proportion of participants who had standard representation of cervical dilatation (1.9% vs 25.6%, p=0.001), uterine contraction 3.9% vs 79.1%, (p=0.001) and fetal descent (11.5% vs 67.4%, p=0.001) after training. In addition, there was a significant reduction in sub-standard representation of uterine contraction 49 (94.2%) vs 8 (18.6%; p=0.001 and fetal descent 40 (76.9%) vs. 11 (25.6%); p=0.001 after the training.

Table 3 compares the utilization of partograms of low risk pregnancies delivered in the labour ward of LUTH analyzed before and after the study. There were 94 low risk pregnancies and 90 low risk pregnancies analyzed before and after the training.

There was a significant reduction in the standard records of blood pressure reading before and after the training (58.5% vs 12.2%), and a significant increase in substandard records in blood pressure reading before and after the training (34.0% vs 78.9%), p=0.0001. None of the other parameters, showed a significant change before and after the training.

DISCUSSION

This study assessed the effect of training on knowledge and use of partogram to monitor low-risk pregnancies at a tertiary health facility. The study found that training led to better knowledge of the partogram, while there was uncertainty of the benefit of training on the utilization of the partogram for low-risk pregnancies. Training caused a non-significant reduction in caesarean section rate, prolonged labour and incidence of mild birth asphyxia in low-risk pregnancies. There was a non-significant increase in augmentation of labour. These findings could be supported by the recommendation of additional support and training for the use of the partogram after a competency-based training on emergency obstetric care.

Table 2: Participants' knowledge of partograms

Knowledge domains	Before training (n = 52) n (%)	After training (n = 43) n (%)	χ^2	p-value
Cervical dilatation				
Standard records	1 (1.9)	11 (25.6)	13.17	0.001
Substandard records	49 (94.2)	32 (74.4)		
No records	2 (3.8)	0 (0.0)		
Uterine contraction				
Standard records	2 (3.9)	34 (79.1)	57.6	0.0001
Substandard records	49 (94.2)	8 (18.6)		
No records	1 (1.9)	1 (2.3)		
Fetal descent				
Standard records	6 (11.5)	29 (67.4)	32.03	0.0001
Substandard records	40 (76.9)	11 (25.6)		
No records	6 (11.5)	3 (7.0)		

Table 3: Analysis of partograms of low risk pregnancies before and after the training.

UTILIZATION DOMAIN	Before Training (n = 94) n (%)	After Training (n = 90) n (%)	χ^2	p-value
Cervical Dilatation				
Standard records	45 (47.9)	50 (55.6)	1.206	0.547
Substandard records	39 (41.5)	33 (36.7)		
No records	10 (10.6)	7 (7.8)		
Uterine Contraction				
Standard records	79 (84.0)	76 (84.4)	0.284	0.867
Substandard records	5 (5.3)	6 (6.7)		
No records	10 (10.6)	8 (8.9)		
Fetal Heart Rate				
Standard records	82 (87.2)	78 (86.7)	3.57	0.168
Substandard records	1 (1.1)	5 (5.6)		
No records	11 (11.7)	7 (7.8)		
Blood Pressure				
Standard records	55 (58.5)	11 (12.2)	43.997	0.0001
Substandard records	32 (34.0)	71 (78.9)		
No records	7 (7.5)	8 (8.9)		
Temperature				
Standard records	1 (1.1)	1 (1.1)	0.613	0.736
Substandard records	83 (88.3)	76 (84.4)		
No records	10 (10.6)	13 (14.4)		
APGAR score				
Standard records	91 (96.8)	84 (93.3)	0.018	0.893
Substandard records	0 (0.0)	0 (0.0)		
No records	3 (3.2)	6 (6.7)		

[12] In addition, the use of a low-risk pregnancy scenario to train and assess knowledge ensured the passage of basic information and skills on partogram use as a foundation for further training on partogram use in difficult circumstances. It is difficult to say if this was achieved going by the observed use of the partogram.

Knowledge of the partogram was the only research objective affected by the attrition of study participants. Training significantly improved knowledge on how to chart cervical dilatation, uterine contraction and fetal descent on the partogram. The impact of improved knowledge on the use of the partogram was greater for uterine contraction and fetal descent. Ninety-four percent (94%) and 19% of participants had sub-standard representation of uterine contraction before, and after training respectively. The proportion of sub-standard representation of fetal descent reduced from 77% to 26% before after the training.

The relationship between knowledge and utilization of the partogram is uncertain. This may be due to different methods and cadre of health care providers as well as the different levels of health systems at which the studies were conducted. For instance, two retrospective audits of partograms of both low and high-risk women in teaching hospitals showed they were inadequately completed. [2, 19] Although, studies have reported an increase in utilization of partogram after training,[7, 14] a scrutiny of used partogram has shown incompletely filled partogram as well as inadequate charting of fetal heart rate, uterine contraction and blood pressure,[7] as if training never occurred.

The impact of training on the use of partogram excluded complicated pregnancies to achieve the research focus. About a quarter of all deliveries in the period before and after the training met low-risk criteria of the study. This study found that training had no influence on the use of partogram by these health workers. While there was no benefit of training on the manner cervical dilatation, fetal heart rate, and Apgar scores were represented on the partogram, the training failed to improve the proportion of sub-standard representation of maternal blood pressure and temperature on the partogram. The lack of blood pressure charting every hour (sub-standard representation) is of great concern as hypertensive disorders of pregnancy, especially, preeclampsia may be undiagnosed in labour until the women develop eclampsia. This has implications in our setting where hypertensive diseases are a major cause of maternal mortality. [19, 20] That the women were not hypertensive at admission in labour should not be an excuse for the irregular documentation of blood pressure as there could be a sudden elevation of blood pressure during labour. Poor recording of blood pressure on the partogram was also reported in an Ethiopian study, [7] in which only 18.6% of blood pressure recordings were standard, while in a Ugandan study,[11] 47.9% of partograms had no documentation of blood pressure measurement. There should be proper documentation by health workers, even in low-risk pregnancies, so that complications may be detected as soon as they occur.

In this study, fetal heart rate recording met the accepted standard in almost every woman in labour. The inability to chart fetal heart rate per protocol has been associated with an increased intrapartum fetal death in Nepal. [16] It is impossible to state that partogram training improved labour outcomes in low risk pregnancies because of the non-significant reduction in caesarean section rate, incidence of prolonged labour and birth of a mildly asphyxiated neonate, in addition to a slightly

higher rate of labour augmentation. In a randomized control trial involving uncomplicated primiparous pregnancies, the use of the partogram did not lead to a significant reduction in caesarean section rate or other measures of outcome when compared to those who had no partogram. [21]

The strength of this study is its focus on the effect of partogram training on low-risk pregnancies. It assessed the impact of training on knowledge and utilization of the partogram, and on health outcomes. The non-translation of improved knowledge to better utilization of the partogram may be due to training of only personnel who gave consent to participate in the study while those who were not trained monitored labour with the partogram as part of their work schedule. In addition, most participants did not have any formal training on the partogram three years before the training. Therefore, continuous and compulsory refresher courses as well as hands-on workshop on the use of the partogram will likely sustain the good knowledge and improve the utilization of partogram. The major limitation of this study was the small number of partogram that met the criteria for low risk pregnancies. This greatly affects the inference made on labour outcomes.

Conclusion

Training health workers on the partogram improved their knowledge, however, uncertainty exist as to the effect of training on the use of the partogram to monitor labour of LRP". Labour ward health care providers should be supported to correctly document on the partogram with regular update training on partogram use.

Competing interests: The authors declare no competing interests.

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