

Steering the predictors to improve the knowledge and utilization of partograph by skilled birth attendants: An intervention study

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ABSTRACT

Context: It was hypothesized that knowledge of skilled birth attendants (SBAs) about partograph and its utilization can be improved by modifying their predictors through training workshops. **Aim:** To upgrade the knowledge regarding partograph and its utilization by SBAs by modifying their predictors through training workshops. **Settings and Design:** This was an intervention study, which was conducted in a rural area of the Jodhpur district of Rajasthan state. **Subjects and Methods:** The SBAs were interviewed through pre and postintervention with the help of a prevalidated semi-structured interview schedule. As a part of an intervention, a series of half-day training workshops were conducted in the intervention block. Data were analyzed using SPSS version 23. **Statistical Analysis Used:** Descriptive statistics, univariate (Chi-square, *t*-test), and multivariate (logistic regression) analysis. **Results:** A total of 213 SBAs (105 from intervention and 108 from control block) were included in the study. SBAs who had received training related to the partograph were having significantly higher odds of knowing (AOR = 22.6[10.7–47.9]) as well as utilization (AOR = 22.5[7.05–72.1]) of partographs as compared to their counterparts. Knowledge was also a significant predictor of the utilization of partograph. Intervention could significantly improve the knowledge of SBAs about partograph as well as its utilization in the intervention block. **Conclusion:** Significant impact of the intervention on knowledge about partograph and its utilization was evidenced in the present study. There is a need to conduct training and refresher courses for healthcare workers on partograph use.

Keywords: Knowledge, partograph, skilled birth attendants, utilization

Introduction

Insufficient uterine contractions during labor or woman's small pelvis causing prolonged labor are considered as one of the leading causes of death among mothers and newborns in the developing world.^[1] In prolonged labor, a woman may

experience serious complications such as obstructed labor, dehydration, exhaustion, rupture of the uterus, infection, and hemorrhage. It can also cause neonatal infections and maternal and perinatal death. To reduce these complications, quality of care at childbirth is a critical determinant of outcomes of care, which to some extent can be achieved through skilled attendance at birth. The presence of skilled care during labor is considered as one of the most cost-effective interventions to attain the sustainable development goal of reducing maternal mortality ratio.^[2,3] However, even after a lot of concentrated efforts by the government, the quality of

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obstetric care remains a neglected area, especially in resource-poor settings.^[4,5]

Skilled management of labor using a partograph helps in identifying abnormal progress and provide timely intervention when required. However, the lack of appropriate and feasible indicators to measure the quality of obstetric care also makes it difficult to meaningfully measure and compare across settings.^[6] According to a study conducted by World Health Organization (WHO) in South East Asia involving 35,484 women, using a partograph can reduce prolonged labor, need for augmentation of labor, need for cesarean sections, and intrapartum stillbirths.^[7] Based on the findings of this study in 1994, WHO recommended universal use of the partograph in all settings as an important indicator to assess the quality of routine care for normal labor.^[8] A systematic review of studies from low-resource settings also suggests that partograph may have a positive impact on labor management.^[9]

Besides having controversies regarding the routine use of the partogram as part of standard labor management and care,^[10] managing labor with partograph has become a mandate as per the Indian Public Health Standard (IPHS) guidelines given by the Government of India for all kind of health facilities.^[11] It has also been proposed as an important tracer indicator for skilled care at birth by the Ministry of Health and Family Welfare, Government of India.^[12] But, merely formulating a policy for promoting routine use of the partograph is not enough to ensure its implementation, as there are other potential factors (e.g., knowledge, availability, training, etc.) which leads to poor utilization of partographs in India and need attention.^[8,13,14]

In the literature search, it was observed that there is a lack of Indian studies, and especially intervention studies from rural areas (up to subdistrict level) to highlight the current level of knowledge about partograph and its utilization. Based on this background, it was hypothesized that knowledge regarding partograph and its utilization by skilled birth attendants (SBAs) can be improved by modifying their predictors through training workshops. Following were the specific objectives of the study:

- 1) To assess the knowledge of SBAs regarding of partograph and find out its predictors
- 2) To assess the level of utilization and factors affecting the utilization of partograph by SBAs
- 3) To upgrade the knowledge regarding partograph and its utilization by SBAs by modifying their predictors through training workshops.

Subjects and Methods

This intervention study was conducted in a rural area of the Jodhpur district of Rajasthan state for a period of 12 months (July 2018 to June 2019). The study was approved by the institutional ethics committee. Two community development blocks were selected from ten community development blocks of Jodhpur district by a simple random sampling method. Considering similar sociodemographic milieu, randomly one

block was selected as an intervention block (*Luni*) and others as a control block (*Mandoor*). All the health facilities including community health centers (CHCs), primary health centers (PHCs), and sub-centers (SCs) of the selected blocks were visited and all the SBAs at these centers were contacted and interviewed for baseline data collection related to the level of knowledge and status of utilization of partograph with the help of a prevalidated semi-structured interview schedule.

The first part of the interview schedule was having questions related to sociodemographic information and work-related attributes of SBAs. The second part was meant for assessment of knowledge about partograph and its components and was having 20 questions. Each of the right responses was given a score as per the criteria mentioned in Table 1.^[15] The total knowledge score was ranging from zero to 40 and was arbitrary categorized into poor (≤ 20) and good (>20) categories.

The third part of the questionnaire was having questions related to the utilization of partograph and perceived barriers in utilizing it. Written consent was taken from each respondent before the commencement of the interview. Status of utilization and its frequency were verified by assessing the filled partographs of last one month at health facilities.

On analyzing the baseline data, it was observed that the most common modifiable predictor responsible for poor knowledge as well as underutilization of partograph was lack of training. Poor knowledge was also perceived as the most common barrier in utilizing partographs by the majority of the respondents. Based on the identified modifiable predictors and barriers, customized training material was developed to upgrade the knowledge of

Table 1: Criteria for the partograph knowledge score

Parameters	No	Yes
Components of partograph		
Fetal heart rate	0	3
Color of liquor	0	4
Cervical dilatation	0	3
Descent of the presenting part	0	5
Uterine contraction	0	5
Maternal blood pressure	0	2
Maternal pulse	0	1
Maternal temperature	0	1
Intravenous fluids and drugs	0	1
Molding	0	5
An assessment made with the partograph		
Prolonged labor	0	1
Obstructed labor	0	1
Poor progress of labor	0	1
Insufficient uterine contractions	0	1
Dehydration in the mother	0	1
Fetal distress	0	1
Abnormal fetal heart rate	0	1
Satisfactory progress of labor	0	1
Need for augmentation of labor	0	1
Need for Cesarean-section	0	1

SBAs regarding partograph and its components and to improve its utilization by explaining its importance and significance of utilization.

A series of half-day intervention workshops were conducted in the intervention block by covering all the SBAs working in that area. Two training workshops per week were conducted with a group of maximum 15 SBAs per workshop for proper facilitation of the sessions. A total of nine intervention workshops were conducted batch-wise (as per the cadre in the job). The training was imparted with the help of PowerPoint presentations and actual partographs in the local language.

After maintaining a gap of 6 months from the intervention, end line data collection was done with the help of a similar tool used in the baseline. Data thus generated were entered into a personal computer and analyzed using Microsoft Excel 2016 and SPSS version 23. Appropriate tables were generated and univariate (Chi-square test and *t*-test) and multivariate (logistic regression) analysis were applied to draw inferences.

Results

A total of 213 SBAs (105 from *Luni* and 108 from *Mandoor*) were interviewed during the baseline survey [Table 2]. As much as 69% of respondents were of more than 35 years of age. The mean age of the respondents was 39.44 ± 7.88 years. About three-fourth of the respondents were female and the majority (64.3%) were auxiliary nurse midwives (ANMs). The mean years of working for SBAs were 13.35 ± 7.73 years. The average deliveries conducted per month by those SBAs were 12.03 ± 21.44 .

Table 3 depicts that on univariate analysis age, work experience, and workload (average deliveries conducted per month) were significantly negatively associated with the knowledge. Medical officers (MOs) were having significantly better knowledge compared to ANMs/others. Those who had received training on partograph were significantly better knowledgeable. On multivariate analysis, training (AOR = 22.6[10.7–47.9]) and less workload (AOR = 2.66[1.13–6.27]) were found as important significant predictors of knowledge ($r^2 = 83.1$).

Table 4 depicts that utilization of partograph was significantly more by male SBAs, MOs, those who were having less workload (≤ 10 deliveries per month), who had received training of partograph and those who were having good knowledge of partograph. On regression analysis, it was observed that training (AOR = 22.5 [7.05–72.1]) and knowledge (AOR = 5.31 [2.15–13.11]) were significant modifiable predictors of utilization of partograph ($r^2 = 85$).

Figure 1 represents the major barriers in utilizing the partograph by SBAs at their workplace.

Table 5 depicts that out of 213 SBAs, 192 (97 from *Luni* and 95 from *Mandoor*) could be contacted during the end line survey.

Table 2: Sociodemographic and work-related attributes of the respondents (n=213)

Variables	n	Percentage
Age		
≤35 years	66	31.0
>35 years	147	69.0
Mean age (years)	39.44±7.88	
Gender		
Male	52	24.4
Female	161	75.6
Category of work		
MO	21	9.9
ANM	137	64.3
Other (SN/GNM/MHW/LHV)	55	25.8
Working years		
≤10 years	76	35.7
>10 years	137	64.3
Avg. working years	13.35±7.73	
Deliveries conducted/assisted per month		
≤10	163	76.5
>10	50	23.5
Avg. deliveries conducted/assisted per month	12.03±21.44	

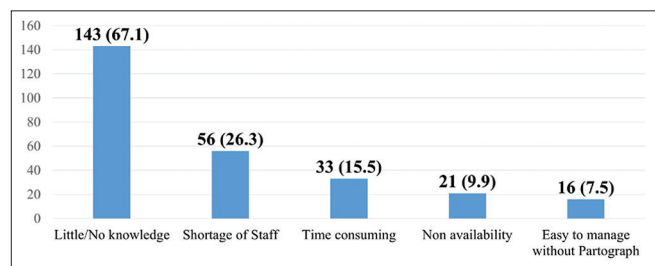


Figure 1: Barriers in using the partograph by SBAs

The impartation of customized training for partograph could significantly improve the knowledge of SBAs about partograph as well as its utilization in the intervention block. No significant difference was observed in the frequency of the use of partograph post-intervention.

Discussion

Knowledge regarding partograph and its utilization at the primary care level is of paramount importance to reduce maternal mortality in the country. This intervention study adds scientific evidence regarding knowledge of SBAs about partograph and status of its utilization in rural Jodhpur, India. In the present study more than three-fourths of the SBAs were female and the majority were ANMs. The average work experience for them was 13.35 ± 7.73 years. These sociodemographic and work-related attributes of respondents are similar to many previous studies conducted on this issue across the world.^[16-18]

Knowledge and its predictors

In the present study, the mean knowledge score for SBAs was 14.28 ± 15.83 (out of 40). On the categorization of the score,

Table 3: Predictors of knowledge of SBAs about the partograph (n=213)

Variables	Knowledge		Total	OR (95%CI)	AOR (95% CI)	
	Good (>20)	Poor (≤20)				
Age (years)	≤35	32 (48.5)	34 (51.5)	66	2.28 (1.25-4.15)*	
	>35	43 (29.3)	104 (70.7)	147	1	
Gender	Male	23 (44.2)	29 (55.8)	52	1.66 (0.88-3.15)	
	Female	52 (32.3)	109 (67.7)	161	1	
Work Category	MO	14 (66.7)	7 (33.3)	21	4.3 (1.65-11.18)*	
	ANM/others	61 (31.8)	131 (68.2)	192	1	
Work Experience (years)	≤10	35 (46.1)	41 (53.9)	76	2.07 (1.16-3.71)*	
	≥10	40 (29.2)	97 (70.8)	137	1	
Avg. deliveries per month	≤10	26 (52)	24 (48)	163	2.52 (1.32-4.82)*	2.66 (1.13-6.27)
	>10	49 (30.1)	114 (69.9)	50	1	1
Received training	Yes	60 (74.1)	21 (25.9)	81	22.29 (10.72-46.34)*	22.6 (10.7-47.9)
	No	15 (11.4)	117 (88.6)	132	1	1
Total		75 (35.2)	138 (64.8)	213		

*P<0.05

Table 4: Predictors of utilization of partograph by SBAs (n=213)

Variables	Partograph utilization		Total	OR (95%CI)	AOR (95% CI)	
	Yes	No				
Age	≤35 years	25 (37.9)	41 (62.1)	66	1.63 (0.88-3.02)	
	>35 years	40 (27.2)	107 (72.8)	147	1	
Gender	Male	25 (48.1)	27 (51.9)	52	2.8 (1.46-5.37)*	8.42 (2.59-27.35)
	Female	40 (24.8)	121 (75.2)	161	1	1
Work Category	MO	15 (71.4)	6 (28.6)	21	7.1 (2.61-19.3)*	
	ANM and others	50 (26)	142 (74)	192	1	
Work experience	≤10 years	28 (36.8)	48 (63.2)	76	1.58 (0.87-2.87)	
	>10 years	37 (27)	100 (73)	137	1	
Avg. deliveries per month	≤10	25 (50)	25 (50)	163	3.08 (1.59-5.95)*	
	>10	40 (24.5)	123 (75.5)	50	1	
Received training	Yes	55 (67.9)	26 (32.1)	81	25.81 (11.65-57.19)*	22.5 (7.05-72.1)
	No	10 (7.6)	122 (92.4)	132	1	1
Knowledge	Poor	14 (10.1)	124 (89.9)	75	18.82 (9.02-39.27)*	5.31 (2.15-13.11)
	Good	51 (68)	24 (32)	138	1	1
Total		65 (30.5)	148 (69.5)	213		

*P < 0.05

Table 5: Change in knowledge and utilization of partograph post-intervention

Variables	Intervention Block			Control Block		
	Before (n=105)	After (n=97)	Sig.	Before (n=108)	After (n=95)	Sig.
Mean Knowledge score	13.04±13.79	31.97±12.43	<0.05	15.50±17.57	17.62±17.84	0.395
Current utilization status	37 (35.2)	71 (73.2)	<0.05	28 (25.9)	26 (27.4)	0.816
Frequency of use (Out of those who were currently using the partograph)						
Always	22 (59.5)	52 (73.3)	0.307	24 (85.7)	20 (76.9)	0.318
Often	5 (13.5)	5 (7.0)		0 (0.0)	2 (7.7)	
Sometimes/Rarely	10 (27.0)	14 (19.7)		4 (14.3)	4 (15.4)	

only around one-third of the SBAs were having good knowledge about the partograph. This level of knowledge is quite lower than the knowledge reported by many authors among health professionals about components and uses of partograph from various other countries of low-resource settings.^[15-23] Almost 38% of the SBAs had received training to use the partograph in the present study. This finding is comparable to the status of training reported by many other studies.^[15,21-24]

On exploring the predictors of knowledge about partograph, it was observed on univariate analysis that SBAs who were MOs, relatively younger (≤35 years), had less work experience (≤10 years), having less workload (conducting/assisting ≤10 deliveries per month) and who had received training to use the partograph, were significantly more knowledgeable as compared to their counterparts. This finding may be attributed to the fact that there is a lack of refresher training for SBAs

for use of partograph at facilities, so those who were freshly passed out from their medical/nursing schools (younger age and less work experience) were having significantly better knowledge. This statement is supported by the findings of Agan *et al.* (2014), who have also highlighted a significant positive association between young age and knowledge about partograph.^[22] Many studies have proved the significant association of knowledge of partograph with training status through univariate analysis.^[16,18,22,25]

After applying multivariate analysis, it was noted that SBAs who had received training were having significantly higher odds of knowledge. The significant association of knowledge of partograph with training status through multivariate analysis has also been evidenced by many authors.^[15-17,23]

Utilization, its predictors, and barriers

In the present study, only around one-third of SBAs were currently using the partograph. This level of utilization was very much similar to the utilization reported by studies from Ethiopia and Nigeria.^[18,23,24] Low utilization of partograph in low- and middle-income countries has also reported by Ollerhead and Osrin (2014).^[26] A higher level of utilization has also been reported by many authors.^[15,17,21,22] On estimating the frequency of partograph use, almost two-thirds of the SBAs were routinely using it at their centers. Wide variations in the context of routine use of partograph have been reported by many studies.^[8,17,19,20,22-24]

The major reasons for not using partograph regularly were documented as lack of knowledge followed by shortage of staff, considering it as a time-consuming procedure, nonavailability of partograph at the facility, and wrong perception that labor can be managed easily without partographs. Similar kinds of barriers in the utilization of partographs with variable proportions have been coated by many authors.^[8,18-22,24,26] The shortage of human resources for healthcare in the Indian context has also been highlighted in studies.^[8,27]

On univariate analysis, gender, work category, workload, training status, and level of knowledge were significant predictors of utilization of partograph for labor management. On multivariate analysis, the status of training and knowledge were important modifiable predictors of utilization of partograph. Gender also came out as a significant predictor of partograph utilization on regression analysis in the present study. Agan *et al.* (2014) have also demonstrated the significant association of utilization of partograph with training status through univariate analysis.^[22] A significant association of utilization of partograph with training status through multivariate analysis has been proved by many authors.^[15,23,24] A significant relationship between knowledge of partograph with its utilization has also been established by many studies.^[18,19,22] Markos and Bogale (2016) have also highlighted a significant association between gender and utilization of partograph.^[21]

Improvement in knowledge and utilization of partograph

The intervention could significantly improve the knowledge of SBAs about partograph and its utilization in the intervention block. Hence, there is a need to conduct regular customized training and refresher courses for healthcare workers on partograph use. The need for and importance of training in this regard has been suggested by many authors from India and abroad.^[13,28-30] This differs from the findings of Ameh *et al.* (2016) who observed the least improvements following training in knowledge and skills in recognition and management of obstructed labor using the partograph.^[31]

Conclusion and Recommendations

The knowledge of SBAs about partograph in the study area was far from satisfactory. Similarly, very poor status of utilization was observed in the study area. On regression analysis, training was found as an important and significant predictor of knowledge as well as utilization of partograph. Knowledge was also a predictor for the utilization of partograph by SBAs. The significant impact of training on the improvement of knowledge about partograph and its utilization has been evidenced in the present study and proved the hypothesis. Therefore, for proper labor management, there is a need to conduct regular training and refresher courses for healthcare workers on partograph use.

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Conflicts of interest

There are no conflicts of interest.

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