

## Research Article

# Knowledge of Partograph among Obstetric Care Providers in Gwagwalada Primary Health Care Centers, Abuja, Nigeria: An Interventional Approach

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**Abstract:** The poor outcome of labour and delivery in sub-Saharan Africa could be related to inadequate knowledge of the partograph. The partograph is an afore-printed paper form on which the outcome of labour monitoring is recorded to assist in reducing maternal and fetal mortality. Hence, this study assessed the effect of nursing intervention on the knowledge of partograph among obstetric care providers in Primary Health Care Centers of Gwagwalada, Abuja. This study adopted a one group pretest-posttest quasi-experimental design also intended to train the trainers in the knowledge of partograph. Purposive sampling technique was used to select 64 participants from the 32 Primary Health care Centers. Socio-demographic questionnaire and test paper on knowledge of partograph (TP-KP) were used to collect data. A total of 59 and 58 obstetric care providers participated in the pre and post-test. A training module was developed for nursing intervention. Data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Descriptive analysis provided answers to the research questions. Inferential statistics; independent t-test and ANOVA were used to provide answers to the hypotheses. Findings revealed that the pre-intervention mean score of knowledge of partograph was moderate ( $13.27 \pm 4.31$ ) and high ( $23.69 \pm 3.19$ ) post intervention. Results also showed significant difference in the pre and post intervention mean scores of all the obstetric care providers on knowledge of partograph ( $p=0.000$ ) and between pre and post-intervention mean scores on knowledge of partograph among various cadres of obstetric care providers ( $p=0.000$ ).

**Keywords:** Knowledge, Nursing Intervention, Primary Health Care Centers, Obstetric Care Providers, Partograph.

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## INTRODUCTION

The burden of maternal mortality still remains a profound cause for global concern. The Millennium Development Goal 5 was adopted globally to reduce maternal mortality between the years 2000 to 2015 (World Health Organization, 2015). The impact was poorly felt in South East Asia and Sub-Sahara Africa where the record of maternal mortality was on the increase (World Health Organization, 2015). In this era of Sustainable Development Goals (SDGs), maternal mortality still remains high (World Health Organization, 2018).

The worldwide estimated number of maternal deaths in 2010 was 287,000, translating to daily deaths of nearly 800 mothers from avoidable causes associated with pregnancy and childbirth (World Health Organization, 2015); a not too significant shift was attained in 2015 when the global estimate of maternal mortality rate was 216 per 100,000 live births. More than 300,000 maternal death occurred globally in the

year 2015 related to complexities of pregnancy, labour and delivery (World Health Organization, 2018). Majority of this mortality were from the developing nations with sub-Saharan Africa contributing 66% (World Health Organization, 2015). In sub-Saharan Africa, a woman possesses 1 in 31 lifetime risk of death from avoidable complications related to pregnancy, childbirth and postpartum as compared to 1 in 4300 in the advanced world (United Nations, 2010). The disparity concerning maternal mortality between the developing and developed countries is a persistent global burden of interest (Zeilellw & Tegegne, 2018).

Nigeria has a maternal death rate estimate of 814 for 100,000 live births in 2015 (Central Intelligence Agency, 2017). According to the joint report by WHO, UNFPA, UNICEF and World Bank, Nigeria is said to have recorded 58,000 maternal deaths in 2015, thereby ranking the fourth country with the highest maternal mortality rate globally (World Health Organization, 2015). Neglected prolonged labour has led to complications of labour related to obstruction, this in

turn, has contributed to increase in preventable maternal mortality and fetal/neonatal wastage (Okpoku & Nguah, 2015). Postpartum haemorrhage and postpartum sepsis are very common when the labour becomes prolonged beyond 18-24 hours.

Early detection of abnormalities of pregnancy, labour, delivery and puerperium is key in preventing maternal death and morbidity. Strategies for early detections of these abnormalities include access to proper antenatal services, facility delivery, presence of a skilled birth attendance and the use of partograph during labour and delivery. The Partograph is a single and simplest tool among all these strategies that performs the function of early detection of complications like cephalo-pelvic disproportion, thereby minimizing the risk of maternal or fetal death.

Partograph is intended to offer a pictorial overview of labour, promptly drawing the attention of the obstetric care providers to deviations from normal in maternal and fetal wellbeing as well as high-lighting the progress of labour (Lavender, Hart & Smyth, 2012). The partograph is a labour monitoring instrument that is widely used and supported by obstetric care professionals. It is prescribed by the World Health Organization for the management of active phase of labour in all levels of health care delivery system (World Health Organization, 2015). The partograph is economical and it is most useful in health institutions with obstetric personnel constraints to enhance the initiation of early referral in the face of complications during labour. It has been known to have decreased neonatal death by 40% when adequately utilized in resource constrained countries (Ogunfowokan, Irinoye, Olowokere & Onipe, 2014).

Studies have established poor knowledge of partograph in Sub-Saharan Africa [Okpoku & Nguah, 2015; Sama, Takah, Danwe, Melo, Dingana & Angwafo, 2017). This also is evident in the Primary Health Care Centers of Gwagwalada, Abuja, where available partograph sheets are not being utilized by the obstetric care providers. This may not be unconnected to limited knowledge. Previous studies have shown that educational interventions on the knowledge of the use of partograph were found to produce positive outcome among care givers (Archa & Smitha, 2013; Al-Dainee, Abdulkarim & Yasir, 2016; Shahri, 2017; Devakirubai, Rebirth, Benjamin & Sebastian, 2018).

Nigeria has an active primary health care system with buoyant reproductive health care policies being initiated and implemented at this level of health care system. This translates to majority of the maternity care being provided by the primary health care facilities. For this purpose, it is paramount that the obstetric care providers in the primary health care institutions possess adequate knowledge of the use of

partograph to improve perinatal outcome and consequently reduce maternal and neonatal mortality.

Several related studies have been conducted in Nigeria, but none has been carried out on PHCs in Gwagwalada Area Council of the Federal Capital Territory. It was to this effect that the researcher embarked on a nursing educational intervention study on knowledge and use of partograph among obstetric care providers in Primary Health Care Centers of Gwagwalada, Abuja.

The relevance of this study was to highlight the importance of obstetric care providers' knowledge of the partograph in labour management. The findings hope to contribute to the improvement of the obstetric care providers' knowledge on the use of partograph which is essential for adequate monitoring of labour, ensuring positive labour outcome and early identification of complications for prompt intervention; this might lead to decrease in maternal deaths. Findings should equally avail opportunity for policy reform through evidences that would be provided by the results. These would significantly contribute to the body of knowledge in nursing and related professions.

## METHODS

The research setting Gwagwalada Area Council, has 32 Primary Health Centers distributed among its 10 wards. These 10 wards are; Zuba, Ibwa, Dobi, Kutunku, TungaMaje, Gwako, Paikon-Kore, Ikwa, Quarters and Central. Gwagwalada Area Council was created on the 15<sup>th</sup> of October 1984 from Kwali District of the defunct Abuja Emirate. It is bounded in the north by Kaduna state, south by Abaji Area Council, east by Abuja Municipal and Kuje Area Councils and west by Niger State. The Primary Health Care Centers in Gwagwalada Area Council provide health care services at the grassroots such as antenatal care, infant welfare, family planning, labour and delivery care among others.

The research design is a one group pretest-posttest educational intervention study intended to evaluate the effect of nursing intervention on the knowledge of partograph for labour management among obstetric care providers in Primary Health Care Centers, Gwagwalada, FCT. This design was adopted so as to enable all the Primary Health Care Facilities to benefit from the educational intervention package that was provided during this study. The research was also designed to train the trainers in the knowledge of partograph.

The population of the study comprised of all trained and certified obstetric care providers working at the 32 Primary Health Care Centers in Gwagwalada Area Council of the FCT. The total number was two hundred and fifty four (254). This consisted of 46 Nurses/midwives, 13 Community Health Officers, 106

Community Health Extension Workers (CHEWS) and 89 Junior Community Health Extension Workers (JCHEW).

Two (2) obstetric care providers were selected from each of the 32 PHCs in Gwagwalada. This was to align the sample size with the decision of the Coordinator of Gwagwalada PHCs to release only two obstetric care providers from each facility to prevent shut down in these facilities.

The researcher liaised with the Coordinator of Gwagwalada PHCs, the Monitoring and Evaluation Officer and Maternal and Child Health Programme Coordinator for selection of participants who could competently train others in their various Primary Health Care facilities upon completion of the study. A purposive sampling method was used to select 64 participants; two obstetric care providers from each facility.

A Socio-demographic Questionnaire (SQ) consisting of 9 items and Test paper on Knowledge of Partograph (TP-KP) consisting of 32 items (10 multiple choice questions and 22 true or false response questions) were the instruments used to collect data from the participants. The instruments were developed in line with the objectives of the study. The strategy of internal consistency was used to establish the reliability of the instruments. The test paper on knowledge of partograph was pretested on 16 OCPs in PHCs of Kwali Area Council in Federal Capital Territory who have similar characteristics with the study group. A computation of the Cronbach's Alpha co-efficient value was found to be 0.72 for instrument TP-KP.

The pre-test paper (TP-KP) was administered on the first day prior to the intervention session. A teaching module developed by the researcher was used during the three sessions of the intervention phase to educate the participants on every aspect of the partograph. The post-test paper was administered two weeks after the last intervention session. The sample size for the study was 64, but 59 and 58 obstetric care providers participated in the pre and post-test respectively, giving an attrition of 5 and 6 participants.

Data collected were coded, then entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 21.0. Descriptive statistics of frequencies, percentages, mean scores and standard deviation was used to describe the socio-demographic

characteristics of the participants and their knowledge regarding the partograph. The obstetric care providers' knowledge of partograph constituted the dependent variable while the nursing intervention was the independent (predictor) variable. Hypotheses were tested using independent t-test and ANOVA to provide answers to the hypotheses generated and set at 0.05 level of significance. The socio-demographic data was analyzed based on the participants' responses; the test paper (TP-KP) which assessed the knowledge of the partograph was scored 0 and 1 for incorrect response and correct response respectively. The maximum score for correct response for knowledge of partograph was 32. The scores were graded into three levels: low knowledge; scores that fall in the range of 0 to 9, moderate knowledge; scores that fall in the range of 10 to 20 and high knowledge; scores that fall in the range of 21 to 32.

Ethical clearance was obtained from the management of PHCs Gwagwalada Area Council. Permission was also obtained from the various primary health care centers; the participants were informed about the study and that their participation was made voluntary. Informed oral and written consent were obtained from the participants. The ethical principles of respect for persons, beneficence, non-maleficance and justice were utilized. Participants were also notified that there would be no penalty for anyone who at any stage of the study, decided to withdraw.

## RESULTS

Data presentations of this study are done based on the research questions and hypotheses earlier set. The results are summarized in tables.

### Study Participants' Socio-demographic Characteristics

The socio-demographic data of the 59 pre-intervention participants are presented in Table 1. The age of the respondents is between 21 and 55, with a mean age of 37.7 years. Majority (59.3%) of the participants were between the ages of 30 and 39. The participants were predominantly females (62.7%), Christians (60%) and CHEW (47.5%); nurses/Midwives constituted only 15.3% of the study population. The graduation year reveal that the majority (28.8%) graduated 1-5 years while the year of service showed that majority (40.7%) had served between 6-10 years. Only 11.9% of the participants had had earlier training on the use and reading of partograph.

**Table 1:** Participants' Socio-demographic Data (N = 59)

Variable	Frequency	%
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Age	20-29years	9	15.3
	30-39years	35	59.3
	40-49years	12	20.3
	50years above	3	5.1
Gender	Male	22	37.3
	Female	37	62.7
Religion	Christianity	35	59.3
	Islam	17	28.8
	Others	7	11.9
Ethnicity	Hausa	14	23.7
	Igbo	6	10.2
	Yoruba	10	16.9
	Others	29	49.2
Profession	Nurse/Midwife	9	15.3
	CHO	11	18.6
	CHEW	28	47.5
	JCHEW	11	18.6
Post graduation Year	No Response	2	3.4
	1-5years	17	28.8
	6-10years	16	27.1
	11-15years	15	25.4
	16-20years	7	11.9
Years in service	21years above	2	3.4
	No Response	4	6.8
	1-5years	16	27.1
	6-10years	24	40.7
	11-15years	11	18.6
Earlier Training	16-20years	3	5.1
	21years above	1	1.7
	Yes	7	11.9
	No	52	88.1
If yes, when?	No Response	52	88.1
	1-5years	5	8.5
	6-10years	2	3.4
	11-15years	0	0.0
	16-20years	0	0.0

### Knowledge of Partograph

Table 2 shows the responses of the participants to the questions on knowledge of partograph at the two phases of the study. At the pre-intervention phase, majority of the participants could define partograph as a visual tool to record the progress of labour, maternal, and fetal wellbeing (67.8%), indicate that 10 minutes is required to adequately assess contractions (76.3%),

while few were able to understand the use of the modified World Health Organization Partograph to commenced at the active phase of labour (13.6%). At the post-intervention phase, most of the participants were able to list the maternal parameters monitored on the partograph (94.8%), identify the components of the partograph (74.1%) and the parameters for monitoring fetal wellbeing (53.4%).

**Table 2:** Pre and post intervention participants' responses on knowledge of partograph

	Pre Intervention	Post Intervention
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S/N	Knowledge	Correct		Not Correct		Correct		Not Correct	
		F	%	F	%	F	%	F	%
	The partograph is a visual tool to record the progress of labour, maternal, and fetal wellbeing	40	67.8	19	32.2	53	91.4	5	8.6
	The use of the modified World Health Organization Partograph is commenced at the active phase of labour	8	13.6	51	86.4	30	51.7	28	48.3
	The partograph is used in all levels of health institution	42	71.2	17	28.8	52	89.7	6	10.3
	Partograph directly reduces maternal and neonatal death	37	62.7	22	37.3	46	79.3	12	20.7
	The partograph consists of the following parts: maternal and fetal conditions, and progress of labour	28	47.5	31	52.5	43	74.1	15	25.9
	The mother's parameter monitored are; blood pressure, pulse, temperature, and urinalysis	23	39.0	36	61.0	55	94.8	3	5.2
	Fetal monitoring includes heart rates, membranes and liquor, moulding and caput	14	23.7	45	76.3	31	53.4	27	46.6
	Partograph assesses the progression of labour through cervical dilatation, fetal head descent and uterine contraction	22	37.3	37	62.7	29	50.0	29	50.0
	The alert line starts at 4cm cervical dilatation	39	66.1	20	33.9	53	91.4	5	8.6
	The action line is where choice of management is made	10	16.9	49	83.1	34	58.6	24	41.4
	Head is said to be engaged when 2/5th or less of the fetal head is felt above the symphysis pubis	37	62.7	22	37.3	51	87.9	7	12.1
	10 minutes is required to adequately assess contractions	45	76.3	14	23.7	57	98.3	1	1.7
	Maternal pulse rate less than 60 beat per minutes indicates maternal distress	44	74.6	15	25.4	44	75.9	14	24.1
	Fetal distress can be seen in very low or very high fetal heart rate	45	76.3	14	23.7	52	89.7	6	10.3
	Maternal pulse rate is documented every 1 hour	8	13.6	51	86.4	34	58.6	24	41.4
	Pulse rate is marked as a dot	38	64.4	21	35.6	57	98.3	1	1.7
	Cervical dilatation is marked with the sign "X"	42	71.2	17	28.8	57	98.3	1	1.7
	Descent of fetal head is denoted by the sign "O"	36	61.0	23	39.0	56	96.6	2	3.4
	When a plotted graph moves to the right of the alert line, it is a warning sign that needs referral of the woman to a hospital	35	59.3	24	40.7	48	82.8	10	17.2

### Pre and Post-intervention Mean Scores on Knowledge of Partograph

Table 3 presents the mean scores on knowledge of partograph among obstetric care providers at the two phases of the study. The pre-intervention knowledge mean score among the obstetric

care providers was 13.27. Thus, it could be said that the obstetric care providers' knowledge mean score of partograph before intervention was moderate. The post-intervention mean score on knowledge of partograph among obstetric care providers was 23.69, consequently indicating a high mean score.

**Table 3:** Pre and post intervention mean scores on knowledge of partograph among obstetric care providers

The knowledge of partograph	Category of scores	Pre- intervention		Post- intervention	
		Freq.	%	Freq.	%
Low	0-9	4	6.8	-	-
Moderate	10-20	47	79.7	8	13.8
High	21-32	8	13.5	50	86.2
Total		59	100.0	58	100.0
Mean	13.27			23.69	
Standard dev.	4.31			3.19	
Maximum	32.00			32.00	
Minimum	4.00			16.00	

**Test of Hypotheses**

**Difference between Pre and Post-intervention Mean Scores of All Obstetric Care Providers**

Result in Table 4 indicates a significant difference in the pre and post-intervention mean scores of all the obstetric care providers on knowledge of partograph (Knowledge gained = 10.42,  $p = .000$ ). Hence the earlier set null hypothesis was rejected while the alternate one is sustained. It could be deduced from

this finding that the difference observed in the pre and post-intervention mean scores on knowledge of partograph could not have been by chance but as a result of the educational intervention the participants were exposed to. Going through the knowledge mean scores as shown above, one can say that the mean score (23.69) at post intervention is significantly higher than the pre-intervention of (13.27).

**Table 4:** Independent t-test to shows the difference between pre and post-intervention mean scores of all the obstetric care providers on knowledge of partograph

	N	Mean	Std. Deviation	Std. Error Mean	df	t	Mean diff	Sig
Pretest	59	13.27	4.31	.866				
Posttest	58	23.69	3.19	.811	115	37.98	10.42	.000

**Difference between Pre and Post-intervention Mean Scores on Knowledge of Partograph among Various Cadres of Obstetric Care Providers**

Results in Table 5 indicate a significant difference in the pre and post-intervention mean scores on knowledge of partograph among various groups of obstetric care providers. Hence the earlier set null hypothesis was rejected while the alternate is sustained. It could be deduced from these findings that the

difference observed in the pre and post-intervention mean scores on knowledge of partograph could not have been by chance but as a result of the educational intervention the participants were exposed to. Going through the f-values and t-values of the pre and post tests shown above, one can say that the f-value (20.262) and t-value (1.501) at post intervention is significantly higher than the pre-intervention of f-value (2.915) and t-value (2.915).

**Table 5:** Independent t-test showing the difference between pre and post-intervention mean scores on knowledge of partograph among various cadres of obstetric care providers

Group	Profession	Mean	N	Std. Deviation	f	T	Sig
Pretest	Nurse/Midwife	16.3333	9	2.82843			
	CHO	14.7273	11	3.71728			
	CHEW	12.4643	28	4.16762	8.499	2.915	.005
	JCHEW	11.3636	11	4.88411			
	Total	13.271	59	4.306			
post test	Nurse/Midwife	25.2222	10	2.72845			
	CHO	24.5000	8	3.50510			
	CHEW	23.3000	30	3.49532	20.262	1.501	.000
	JCHEW	23.0000	10	2.16025			
	Total	23.6897	58	3.19103			

**Summary of Scheffe Post-Hoc Analysis**

Table 6 shows that the post-intervention mean scores on knowledge of partograph among various cadres differ significantly. This implies that the effect of the treatment obtained in Table 5 is the result of the significant difference between the pairs of cadre 1, 3

and 4, group 2, 3 and 4, as well as group 3 and 4. This further buttress the rejection of the null hypothesis stating that there is no significant difference in the post-intervention mean scores on knowledge of partograph among various cadres of obstetric care providers.

**Table 6:** Summary of Scheffe Post-Hoc Analysis on Post-Test Mean on knowledge of partograph According to cadre

Cadre	Mean Score	Treatment on cadre			
		1	2	3	4
Nurse/Midwife	25.2222			*	*
CHO	24.5000			*	*
CHEW	23.3000				*
JCHEW	23.0000				

Note: \* Denotes pairs of groups significantly different at the 0.05 level.

## DISCUSSION

Findings revealed that the pre-intervention mean score on knowledge of partograph was  $13.27 \pm 4.31$ . It could be said that the knowledge of partograph among obstetric care providers before intervention was moderate: similar Eastern Ethiopia findings which revealed that only 11.3% and 45.4% of the respondents in their study had poor and fair knowledge of the partograph respectively (Mezmur, Semahegn & Tegegne, 2017). Also, Archa and Smitha (Archa & Smitha, 2013) found that none of their participants possessed adequate knowledge of the partograph at pre-test level. In a related study carried out in Calabar, results indicated that 70.8% of respondents had good knowledge of the partograph but displayed absence of comprehensive knowledge on the partograph's components (Asibong, Okokon, Oku, Opiah, Essien & Manjok, 2014). This finding however, disagrees with another study in Bale Zone, Ethiopia which revealed that 61.5% of respondents had good knowledge of the partograph (Markos & Bogale, 2016).

The fair knowledge mean score among the obstetric care providers can be attributed to lack of periodic training on partograph, lack of use of the partograph, poor supervision and auditing in the Primary Health Care facilities. The moderate knowledge displayed could equally be linked to the nurse/midwives and Community Health Workers (majority are trained nurse/midwives) who had earlier undergone extensive training on partograph use during their programmes.

After intervention in this study, the post-intervention knowledge mean score was  $23.69 \pm 3.19$  with a mean score difference of 10.42. It could be said that the knowledge of partograph among obstetric care providers before intervention was fair but there was a great improvement after intervention. This outcome agrees with the findings of a study where 80% of the participants in the experimental group demonstrated good knowledge about the partograph after the intervention (Al-Dainee *et al.*, 2016). The intervention

programme was shown to be instrumental in transforming the initial participants' poor knowledge of partograph use to high knowledge.

The high knowledge demonstrated by the obstetric care providers in this study is not by chance but closely related to the intervention package provided during the study. Moreover, the training was done with mixed teaching methods involving tutorials, lecture and demonstrations with lots of graphic display.

The outcome of the study demonstrates a significant difference in the pre and post-intervention mean scores of all care providers on knowledge of partograph ( $p=0.000$ ). The null hypothesis was therefore rejected with the acceptance of the alternate. This implies that the nursing educational intervention has significantly affected the knowledge of obstetric care providers on partograph positively. It could be deduced from these findings that the difference observed between pre and post intervention groups could not have occurred by chance but as a result of the educational intervention the participants were exposed to. This corroborates the findings of a related study on the outcome of intervention program concerning partograph among midwives which reported that after the intervention programme, 80% of the participants in the experimental group demonstrated good knowledge about the partograph (Al-Dainee *et al.*, 2016). Also, the findings from Mangalore, India (Archa & Smitha, 2013) indicated that intervention through education was productive in improving the level of knowledge of their participants. This signified that intervention through education was productive in improving the level of knowledge of the participants.

The results of the study indicates a significant difference in the pre and post-intervention mean scores on knowledge of partograph among various cadres of obstetric care providers ( $p=0.000$ ). The null hypothesis was therefore rejected and the alternate accepted. The results showed that among the various cadres of obstetric care providers, Junior Community Health Extension Workers (Knowledge gained = 11.36) gained more in the training compared to others: Community

Health Extension Workers (Knowledge gained = 10.66); Community Health Officers (Knowledge gained = 9.97) and Nurse/Midwife (Knowledge gained = 9.89). This agrees with the observation from School of Midwifery in Malaysia which showed a significant difference in participants' knowledge and practices for pre and post-intervention in both groups ( $p=0.001$ ) (Shahri, 2017). It could be deduced from these findings that the difference observed in the pre and post-intervention mean scores on knowledge of partograph could not have been by chance but as a result of the educational intervention the participants were exposed to. The higher knowledge gain among the JCHEWs and CHEWs is not unconnected to the immense interest shown by these cadres of obstetric care providers which can be attributed to their constituting the larger number of the work force in the Primary Health Care facilities. It therefore can be implied that majority of labour and delivery care are rendered by the CHEWS and JCHEWS.

## CONCLUSION

For many years, the partograph has been used as a standard for monitoring obstetrical labour. The main reason for using the partograph in monitoring labour is the assumption that it would guide in early identification of problems during labour, and hence assist in taking appropriate actions that can lead to reduction in mortality and morbidity to both mother and neonate. Adequate knowledge on the use of partograph is an essential procedure in midwifery care, and also helps in clinical decision-making during labour. From the findings of the study, it can therefore be concluded that in order to reverse the poor obstetric indices that have persisted despite almost two decades of international focus on the issue, urgent workable solutions are imperative. And this could be achieved through training obstetric care providers on knowledge of partograph at all levels of care. This is one of the goals of the Sustainable Development Goals.

The study recommends that Periodic workshops and seminars should be organized for nurses and midwives and other obstetric healthcare providers to enhance their knowledge on the use of partograph in the assessment and monitoring of labour. All registered nurses and midwives should always renew their knowledge through continuous education.

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