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Research Article

Knowledge and Utilization of Partograph in Labor Monitoring Among Nurses and Midwives in a Tertiary Health Facility in South-South Nigeria

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ABSTRACT

Maternal mortality is an important health indicator of any country. The use of partograph would engender a remarkable reduction in the number because abnormality in labor would be identified early for prompt intervention. A cross sectional descriptive survey design was used to assess knowledge and utilization of partograph in monitoring of labor by nurses and midwives in a tertiary health institution in South- South, Nigeria. Three research questions and one hypothesis were formulated for the study. Eighty-six midwives working in maternity annex were used. The instrument for data collection was a self-developed structured questionnaire and checklist. The checklist was used to extract information needed to fill the partograph. Data was analyzed using simple percentages and hypothesis was tested using chi square test analysis. Results revealed that 73 (84.9%) midwives had good knowledge of partograph. In utilization of partograph in labor monitoring, 84 partographs were properly filled. The χ^2 analysis revealed a statistical relationship between level of knowledge, years of experience and utilization of partograph when the calculated chi square of 28.93 and 30.82 were both greater than the critical χ^2 of 3.841 and 7.815 with 1 and 3 degrees of freedom respectively. Factors hindering utilization were lack of knowledge, non-availability, time consuming, shortage of staff and detailed to complete. Based on these, training of nurses and midwives on the use of the partograph with periodic workshops and seminars and a mandatory hospital policy were recommended as this will help in monitoring of maternal and fetal wellbeing.

Keywords: *Partograph Knowledge and Utilization, nurses, midwives, labour, tertiary Institution*

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INTRODUCTION

Labour, the process of giving birth is often a difficult time for many pregnant women. The process requires adequate management by midwives and obstetricians for pregnant women to have safe delivery. One of the tools recommended by the World Health Organization, utilized by midwives to effectively manage labor is the partograph. Partograph is derived from the Latin word partum (childbirth) + graph which means 'labor curve'. The partograph is a printed chart on which observations in labor are recorded in a graphic format to provide midwives and obstetricians information about the progress of labor and to monitor maternal or fetal wellbeing (Lavender, Hart & Smyth, 2009). The partograph is an inexpensive tool designed to provide a continuous pictorial overview of labor and has been shown to improve outcomes

when used to monitor and manage labor. It is a single sheet of paper which includes information about the fetal heart rate, uterine contraction, any drugs used and other important factors that could help avoid extensive descriptive notes. With its use, Magon (2011) explains that there is no need to record labor events repeatedly as it helps predict deviation from normal progress of labor, and supports timely and proven intervention. It also helps to facilitate responsibility to the person conducting labor.

The first composite partograph by the World Health Organization covers a latent phase of labor of up to 8 hours and an active phase beginning when the cervical dilatation reaches 3 cm. The active phase is depicted with an alert line and an action line, drawn 4 hours apart on the partograph. This partograph is based on the principle that during active labor, the rate of cervical dilation should not be slower than 1

cm/hour. Since a prolonged latent phase is relatively infrequent and not usually associated with poor perinatal outcome, the usefulness of recording the latent phase of labor in the partograph has been questioned. Moreover, differentiating the latent phase from false labor is often difficult (Mathai, 2009). To alleviate these disadvantages, a modified WHO graph' was introduced and incorporated removal of the latent phase and defined the beginning of the active phase at 4 cm cervical dilatation instead of 3 cm (Levin & Kabagema, 2011).

The World Health Organization, the Maternal and Neonatal Health Best Practices (2015), the Society of Obstetricians and Gynaecologists of Canada and several articles (Lavender *et al*, 2009; Orji, 2008; Mercer, Sevar & Sadutshan, 2006) in the literature have justified the use of the partograph as the best tool to establish prolonged and obstructed labor based on the outcome of controlled trials, clinical audits and systematic reviews of randomized trials. However, it has been observed that despite the World Health Organization advocating and recommending that the use of partograph to monitor the process of labor be made compulsorily, the level of utilization is still reported to be low, mostly in the developing countries especially in primary health care centres where most of the deliveries takes place. (Okechukwu, Adesegun, Niyi, Babalola & Uche, 2007).

Several factors contribute to poor utilization of the partograph by midwives and obstetricians to monitor labor. A study in Kenya reported a significant gap between knowledge and practice. Another study in Nigeria found that although majority of midwives and obstetricians recognized the usefulness of the partograph in monitoring labor, only 35 percent could correctly explain the purpose of using the partograph and only 25 percent used it on a routine basis (Archibong & Agan 2010).

In Cross River State Oyo-Ita, Van der Kooi, Etuk, Nwagbara, Gamer, Meremikwu and Smith (2013) reported that the rate of utilization of the partograph in monitoring the progress of labor in 13 health facilities was low (42%). Maternal mortality was observed to be high in the study area and this motivated the study.

Maternal mortality rate has continued to rise, especially in the developing countries despite advancements in health technology (Sageer, Kongnyuy, Adebimpe 2019, Say Chou, Gemmil Tuncalp & Moller 2014). Globally, an estimated annual maternal death of more than 295 000 from complications of pregnancy and childbirth, occur in developing countries (WHO, 2019). Nigeria has a maternal mortality ratio of about 814 per 100,000 live birth as at 2015 (WHO, 2017) and it varies between geographical zones. Majority of these deaths, complications and neonatal outcome could be prevented by cost-effective and affordable health interventions like utilization of the partograph to monitor labor.

Despite recognition that the partograph is an effective tool for monitoring labor, and when used effectively, will prevent prolonged or obstructed labor, which accounts for maternal and neonatal deaths the level of utilization of the partograph by midwives and obstetricians is not impressive. In Cross River State, Agan, Archibong, Abeshi & Bassey (2010) reported that between 1999 and 2009, a mortality ratio of 831

per 100,000 live births was recorded. What could have contributed to such alarming figures is not known. Could it be that the progress of labor is not monitored using the partograph? The situation does not portray a good image of the healthcare system. If the trends continue like that, it would not augur well for healthcare institutions. This study was therefore motivated by the need to assess in knowledge and utilization of the partograph among nurses and midwives in a tertiary hospital in South-South Nigeria.

The purpose of this study is to assess knowledge and utilization of partograph in the management of labor among nurses and midwives in a tertiary health facility in South-South Nigeria.

MATERIALS AND METHODS

Research design: The research design adopted for this study was a cross sectional descriptive survey design to assess the knowledge and utilization of partograph in the management of labor among nurses and midwives in a tertiary hospital in South- South Nigeria from September 2019- December 2019.

Research setting: The study was carried out in Calabar at the University of Calabar teaching Hospital, Calabar. Calabar is the capital of Cross River State. It is an ancient city in the history of Nigeria and was the first capital of Nigeria. Calabar is located on a peninsula between Calabar River and the Great Kwa River. It lies 4⁰56 North of the equator and 8⁰22 East of the meridian of Greenwich. It has an estimated population of about 1.293 million people (National Population Census, 2006) University of Calabar Teaching Hospital (UCTH) was founded in 1897. The permanent site which is the site of the study is located on the North Eastern part of the University of Calabar, along Uncial Hotel road. It has the responsibilities of manpower development (teaching), treating of patients at specialist level (clinical services) and promotion of scientific knowledge (research). The hospital is made up of Thirty-one (31) Units and four (4) training schools. The health institution renders training, clinical, research and referral services. The hospital was chosen because it is the only tertiary health facility in the study area where mandatory policy on labor monitoring with partograph is recommended. In other facilities inconsistency remains a problem in utilization.

Research Population: The total population of the study consisted of all nurses and midwives working in the hospital. Accessible population comprises of all the 86 nurses and midwives working in the maternity annex of the tertiary hospital.

Sample and Sampling Technique: All the 86 midwives working in the maternity annex were used for the study hence no sampling technique was adopted.

Instrument for Data Collection: The instrument used for data collection was a four section self-developed semi-structured questionnaire, partograph and a check list. Utilization status of the partograph was assessed by reviewing purposely selected 100 partographs using observational checklists.

Reliability of the Instrument: To ensure the reliability of the research instrument, test-retest reliability was done using 10 nurses and midwives in the labor ward of general hospital, Calabar in two different occasions, within an interval of two weeks. The separate results when correlated using the Pearson's Product Moment Correlation (r) and a reliability coefficient 0.82 obtained.

Method of data collection: The researchers personally visited the hospital where they administered questionnaires to all the nurses and midwives in the study area. The purpose of the study was explained to the midwives before administering the questionnaires. At the end of the exercise, all the questionnaires administered were retrieved without any losses. Checklist was also used to extract information from the partograph. The data collection lasted for three weeks due to shift duty.

Method of data analysis

Data collected were presented using frequencies, tables and percentages. The hypotheses were tested for significance at 0.05 level of significance, using the Chi-square (X²) statistics.

Ethical considerations: The researchers obtained approval to conduct the study from research and ethical committee of the hospital. Participants were given vivid explanations of the nature and significance of the study to ensure voluntary participation. Data obtained was treated with utmost confidentiality through anonymity.

RESULTS

Socio-demographic data: The result from table one shows that out of the total nurses, 86 (100%), 46 (53.5%) practiced in labor ward, 40 (46.5%) practiced in ante natal ward, 22 (25.6%) of nurses were between age 21-30 years, 40 (46.5%) were between age 31-40 years, 11 (12.8%) were between age 41-50 years while 13 (15.1%) were 51 years and above. On professional qualifications, RN/RM were 30 (34.9%), RN/RM/B.Sc. 48 (55.8%), B.Sc./ M.Sc./ others were 8 (9.3%). With regards to years of experience, 12 (14%) years of experience was between 1-10 years, 18 (21%) had 11-20 years of experience 24 (28%) had 21-30 years of experience and 32 (37%) of nurses had 31 years of experience and above.

Nurses and Midwives' level of knowledge on the use of partograph: The result from Table 2 on nurses and midwives level of knowledge on the use of partograph in labour management shows that 64 (74.4%) of respondents use partograph in labor monitoring, while 22 (26.4%) of respondents did not use partograph in labor management. 78 (90.7%) of nurses and midwives could define partograph, while 8 (9.3%) did not know the correct definition of partograph, 70 (81.4%) of respondents knew partograph is divided into three distinct sections while 16 (18.6%) respondents did not know. 84 (91.7%) respondents agreed that partograph must only be commenced on clients that is in active labor, while 2 (2.3%) of nurses did not know when to open partograph. With regards to plotting of partograph on alert line

to monitor labor progress, 68 (79.1%) agreed while 18 (20.9%) disagreed.

Responses of respondents' knowledge of partograph shows that 73 (84.9%) have good knowledge of partograph, while 13 (15.1%) have poor knowledge of partograph (Table 3).

Table 1

Showing frequency distribution and percentages of socio-demographic data of nurses and midwives in maternity annex

Variables	Frequency	Percentages %
Age of Nurses		
21-30 years	22	25.6
31-40 years	40	46.5
41-50 years	11	12.8
51 and above	13	10.1
Total	86	100
Professional qualification		
RN/RM only	30	34.9
RN/RM/B.Sc	48	55.8
B.Sc./M.Sc./others	8	9.3
Total	86	100
Years of experience		
1-10 years	12	14
11-20 years	18	21
21-30 years	24	28
31 years and above	32	37
Total	80	100
Ward of practice		
Labour ward	46	53.5
Ante natal ward	40	46.5
Total	86	100
Variables		

Table 2:

Responses on nurses and midwives' level of knowledge on the use of partograph.

Items	Agreed	Disagreed	Total
Have you ever used partograph in monitoring labor?	64 (74.4%)	22 (25.6%)	86 (100%)
Partograph is a tool to guide decision making during labor?	78 (90.7%)	8 (9.3%)	86 (100%)
Partograph have three distinct sections related to observations on maternal, fetal condition and progress of labor	70 (81.4%)	16 (18.6)	86 (100%)
Partograph must only be commenced on client that is in active labor?	84 (97.7%)	2 (2.3%)	86 (100%)
In monitoring of progress of labour, plotting of the partograph is on the alert line	68 (79.1%)	18 (20.9%)	86 (100%)

Table 3:

Summary of nurses and midwives' level of knowledge of partograph

Knowledge on Partograph	Frequency	Percentage
Good knowledge of partograph	73	84.9%
Poor knowledge of partograph	13	15.1%
Total	86	100

Table 4 shows that 84 (84%) of the partograph were opened at 4cm while 16 (16%) were not opened at 4cm. In 80 (80%) partograph cervical dilation was assessed at every vaginal examination; in 84 (84%) partographs, vaginal examination was done every 4 hourly, while 16 (16%) it was not properly filled. In 85 (85%) partograph, cervical dilation was plotted with X sign, while 16 (16%) was not. In 90 (90%) partograph first cervical dilation was plotted on alert line, while 10 partographs cervical dilation was not plotted on alert line. In monitoring of uterine contractions, 84 partographs future contracting were monitored every 30 minutes. In 80 partographs fetal conditions was monitored 1/2 hourly while in 20 partographs were not monitored correctly. In 86 partographs maternal pulse was monitored every 30 minutes while temperature and BP were monitored 4 hourly

Table 4:
Observational checklist on utilization of partographs: n= 100

Observations	Frequencies		Total 100
	Yes	No	
Partograph open at 4cm dilated	84 (84%)	16 (16%)	100
Cervical dilation assessed at every vaginal examination	80 (80%)	20 (20%)	100
Vaginal examination done every 4 hrs until cervix is 8cm dilated	84 (84%)	16 (16%)	100
Cervical dilation plot on within x sign	85 (85%)	15 (15%)	100
First cervical dilation (on admission) plotted on the alert line	90 (90%)	10 (10%)	100
Uterine contraction monitored every 30 minutes	84 (84%)	16(16%)	100
Fetal condition monitored % hourly	80 (80%)	20 (20%)	100
Maternal pulse recorded ½ hourly and temperature/ BP 4 hourly	86 (86%)	14 (14%)	100

The result on table 5 shows the summary of assessment of utilized partographs. The result shows that out of the 100 partographs that was extracted from the patient folders in labour ward, using questions on observational checklist. The result showed that 84 partographs were properly filled while 16 partographs were not properly filled.

Table 5:
Summary of utilization of partograph in labor monitoring.

Assessment of utilized partograph	Frequency	Percentage
Properly filled	84	84%
Not properly filled	16	16%
Total	100	100%

The result in table 6 above shows the factors affecting partograph utilization among nurses and midwives in maternity annex, 73 (84.9%) of knowledge said lack of

knowledge is not hindrance, while 13 (15.1%) demonstrated lack of knowledge as hindrance to utilization; 26 respondents agreed that non availability is hindrance to utilization, while 60 (69.8%) disagreed. With regards to time consuming as hindrance, 76 (88.4%) of respondents agreed to it while 10 (11.6%) respondents disagreed to the option. 60 (69.8%) respondents agreed that shortage of staff is hindrance to utilization, while 26, (30.2%) disagreed. With regards to detailed to complete as a hindrance to utilization 80 (93%) respondents agreed while 6 (7%) disagreed.

Table 6:
Factors affecting partograph utilization in labor monitoring among nurses and midwives(n-86.)

S/N	Factors affecting partograph utilization	Yes	No	Total
1	Lack of knowledge	13 (15.1%)	73 (84.9%)	86 (100)
2.	Non availability of partograph	26 (30.2%)	60 (69.8%)	86 (100%)
3.	Partograph is time consuming	76 (88.4%)	10 (11.6%)	86 (100%)
4.	Shortage of staff	60 (69.8%)	26 (30.7%)	86 (100%)
5.	Detailed to complete	80 (93%)	6 (7%)	86 (100%)

The result in table 7 shows that there was a significant relationship between knowledge and utilization of partograph in labor management with the calculated X^2 of 28.93 significantly greater than the critical X^2 of 3.841 with 1 degree of freedom. Also, in years of midwives experience and utilization of partograph, the result shows a statistical relationship between midwives years of experience and utilization of partograph when the calculated X of 30.82 was greater than the critical X^2 of 7.815 with 3 degrees of freedom. With these results, the null hypothesis was rejected, meaning that there is a significant relationship between nurses and midwives' level of knowledge, years of experience and utilization of partograph in labor management in UCTH maternity.

DISCUSSION

The result of the findings on the level of knowledge of partograph among nurses and midwives in maternity annex revealed that majority of the midwives 73 (84.9%) had good knowledge of partograph. This study shows that knowledge about partograph was a significant factor in its utilization in monitoring labor. The above findings was supported by Opiah *et al.*, (2012) in their study on knowledge and utilization of the partograph among midwives in the Niger Delta region of Nigeria, the study revealed that majority of the respondents had good knowledge of partograph and also indicated that the use of the partograph reduces maternal and child mortality in the study area.

Table 7:

Showing Chi Square analysis of the relationship between knowledge, years of experience and utilization of partograph in labor monitoring among nurses and midwives (n=86).

Variable	Utilization		Total	df	Cal. ²	X ² cri.
	Use%	Non Use %				
Knowledge of partograph						
Poor knowledge	3 (11.0)	10(3)	13	1		3.841
Good knowledge	70 (62)	3(H)	73			
Total	73	13	86		2893	3.841
Years of Experience						
1-10 years	2 (9.3)	10 (2.7)	12			
11-20 years	15 (14)	3 (4)	18	3		7.815
21-30 years	20 (18.7)	4 (5.3)	24			
31 years and above	30 (24.9)	2 (7.1)	32			
Total	67	19	86		30.82	7.815

Also, in supported of the above Fantu *et al* (2006), on their study on the evaluation of labor using partograph, the study revealed that good knowledge among midwives. The study also showed fair and poor level of knowledge by junior CHEW. In the study, despite the good knowledge demonstrated by majority of the midwives used for the study, majority of them 13 (15.1%) still demonstrated poor knowledge on the use of labor monitoring. Similar study by Engida *et al* (2013) in Addis Ababa, - Ethiopia confirmed low utilization of partograph due to poor knowledge. Inadequate knowledge and utilization of this simple tool could be part of the reason for the high maternal mortality rate in the study area.

The findings on the level of utilization of partograph in monitoring progress of labor among nurses and midwives revealed that using observational check list to assess utilized partograph charts, out of the 100 partograph charts used for the study, 84 were properly filled and 16 were not properly filled. This result was supported by Opiah *et al* (2012) study on knowledge and utilization of partograph. The study revealed that most partograph were properly filled, while some were not properly filled. This result showed few respondents had inadequate knowledge on the use of partograph, same affected the utilization. The sad outcome is that this tool is not uniformly utilized in the setting where it is most needed at peripheral health and maternity centers.

Results from this study revealed that in factors affecting the utilization listed were lack of knowledge, non-availability, time consuming, shortage of staff, and detailed filling. In the study area, there still exist gap in knowledge non availability, time consuming, shortage of staff and detailed to complete. This study is supported by Opiah *et al* (2012) who discovered that knowledge of partograph is a significant factor in its utilization in monitoring labor. The study also stated that utilization of the partograph was significantly related to staff strength; it is probably as a result of staff shortages that some midwives consider the use of partograph as a waste of valuable time. The study also revealed significant relationship between availability and utilization of the partograph, lack of support from management in terms of providing the essential supplies and equipment including the provision of partograph in the adoption and utilization of the partograph. It is possible that respondents actually experienced the same limited resource situations in the study area and availability of partograph in the labor ward did play a significant role in determining its utilization in the monitoring of labor.

The result from hypothesis testing revealed a significant relationship between knowledge and utilization of partograph in labor monitoring when the calculated X² of 28.93 was greater than the critical X² of 3.841. Also, there was a significant relationship between years of experience and utilization of partograph in labor monitoring when the calculated X² of 30.82 was greater than the critical X² of 7.815 at 3 degrees of freedom. Opiah *et al.*, (2012) is in support of the above when they stated that knowledge about the partograph is a significant factor in its utilization in monitoring labor. Opiah *et al.*, (2012) also support the findings when their study on knowledge and utilization of partograph in Niger Delta region revealed a significant relationship between years of experience of midwives and their used of the partograph. The introduction of the partograph and its use should be an organizational (hospital) policy that has to be carried out regardless of nurses and midwives' years of experience. This finding supports the relationship between knowledge and the utilization of any relatively new policy.

In conclusion, this study revealed that despite adequate knowledge by midwives, some of the partograph were not properly filled. Nurses and midwives professional years of experience and knowledge was significantly related to the adoptions and utilization of the partograph use during labour . Factors like knowledge, non-availability, time, shortage of staff and detailed filling also affected utilization in labour. This study was limited to only nurses and midwives working in the maternity annex of the tertiary hospital. The findings of this study should not be generalized to all the health facilities in South-South Nigeria. A comparative analysis of all health facilities would have been ideal. But nevertheless, the findings from this study may help in addressing the inadequacy in midwifery practice in the study area. Therefore, it hoped that this study will form the basis for further research in partograph. Conclusively, the study calls for pre-service and periodic on-the-job training on partograph use in labour.

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