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Various Health Care Providers' Knowledge of the Partogram Use during Childbirth, at the Bamenda Health District, Cameroon

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

In a state of affairs where the provision of care to the child birth process is not purely in the hands of educated and trained midwives, the competency in knowledge and application of midwifery tools may be inadequate and consequently affect the quality of care. One of these tools is the partogram which is an inexpensive tool that can provide a continuous pictorial overview of labour and is essential to monitor and manage labour. The success of its use requires good knowledge and skills gained through formal education and regular in-service training. Furthermore, the partogram requires technical knowhow to carry out the observations and documentations. The lack of knowledge in its use leads to poor monitoring of labour where problems may be identified late, resulting in complications which may cause maternal and neonatal morbidity and mortality.

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This study assessed the existing knowledge and relationship between trained and untrained birth attendants (BAs) regarding the use of the partogram in nine public health facilities in Mezam Division, North West Region, Cameroon.
A cross sectional descriptive study was conducted using three tools - self-administered questionnaire, record review and an interview guide. Major findings indicated a good level of knowledge (61.8%). Statistical relationships were found between professional level and knowledge on the use of the partogram, and knowledge and training on the use of the tool.

Keywords: Childbirth; tools; partogram; knowledge; birth attendants; training needs.

1. INTRODUCTION

Maternal mortality figures remain high in most parts of the developing countries. According to the World Health Organization -WHO [1], the number of women who die each year from causes related to pregnancy or childbirth has dropped substantially – from 543,000 deaths in 1990 to around 287,000 deaths in 2010. The risk of a woman dying as a result of a complication related to pregnancy in developing countries is estimated to be as much as a hundred times that of women in Western Europe or North America [2]. Despite the continued focus on the reduction of maternal mortality by stakeholders and the development partners, it still remains a major public health problem in sub-Saharan Africa [3], particularly in Cameroon where maternal mortality rate continues to increase at an unacceptably high level. In Cameroon, maternal mortality ratio stands at 782/100,000 live births - Lbs [4] and it is classified as one of the countries health problems making no progress in the achievement of the Millennium Development Goals - MDG [3]. Maternal and neonatal program effort -MNPI [5] observed that maternal deaths only tell part of the story. For every woman or girl who dies as a result of pregnancy-related causes, between 20 and 30 more will develop short- and long-term disabilities, such as obstetric fistula, ruptured uterus, or pelvic inflammatory disease. The MNPI [5] ratings indicate that Cameroon's program efforts for better maternal and neonatal health have come a long way but still have much to do.

Labour has been termed the most dangerous journey a human being ever undertakes. The reason being that although it is a natural process, complications can arise at any time during its course [6]. Continuous monitoring of labour and provision of rapid care to deal with problems are most crucial for preventing adverse obstetric outcomes related to childbirth [7]. Prolonged or obstructed labour is one of such complications, which is a major contributor to maternal and newborn morbidity and mortality [2,8,9]. The number of maternal deaths as a result of obstructed labour and/or rupture of the uterus varies between 4% and 70% of all maternal deaths, amounting to a maternal mortality rate as high as 410/100,000 live births [8]. Some 8% of all maternal deaths in developing countries are due to obstructed labour [10]. In under-resourced settings, prolonged labour and delay in decision-making are important causes of adverse obstetric outcomes. Owing to resource constraints in such settings, it is usually not possible to monitor each woman continuously throughout the duration of labour [7]. Early detection of abnormal progress of labour and the prevention of prolonged labour would significantly reduce the risk of postpartum haemorrhage (PPH) and sepsis, and eliminate obstructed labour, uterine rupture and its sequelae [11]. As there is no universal definition of 'normal' labour, diagnosing prolonged labour is inherently difficult. Simple charts (partograms or partographs) are used to aid this process [14]. The partogram is a Greek word which means labour curve [15]. It has been heralded as one of the most important advances in modern obstetric care [16]. WHO advocates its use as a necessary tool in the management of labour and recommends its universal use during labour [11].

1.1 History of the Partogram

Friedman [17] was the first obstetrician to provide a tool for recording individual labours in 1954. Following a study on 100 women in the United States of America (USA), he described a normal cervical dilatation pattern [12]. He divided labour functionally into two parts. The latent phase extends over 9-10 hours and up to 3 cm dilatation followed by an active phase, characterized by acceleration from 3-10 cm at the end of which the deceleration occurred. The resulting graph had an S-shaped curve [13]. This work has been the foundation on which others have built the modern partogram which now incorporates many relevant parameters related to progress of labour, as well as the condition of the mother and foetus.

Philpott [18], subsequently used this information to develop a tool initially referred to as cervicograph. He used this tool in Zimbabwe in an attempt to use the service of midwives efficiently in the health services where doctors were in short supply. From this original cervicograph, Philpott developed a partogram, a practical tool for recording all intrapartum details, not just cervical dilatation. Philpott subsequently added an "alert line." This was a straight line, not curved like Friedman's cervicograph, and was a modification of the mean rate of cervical dilatation of the slowest 10% of primigravid women in the active phase of labour. The alert line represented a progress rate of 1cm per hour. The purpose of the alert line was to aid the midwife in a peripheral unit, or a general practitioner, midwife or house surgeon in any hospital to detect at the earliest possible moment an abnormal labour.

The next stage in the development of the partogram was the introduction of an "action line" which was placed 4 hours to the right of the alert line. This allowed "time to transfer the patient without impairing the success of the essential active management" and also allows "many normal patients to deliver vaginally without active intervention." Philpott and Castle recommend pelvic reassessment to rule out CPD when the action line is reached followed by a trial of oxytocin, adequate hydration, and a caesarean delivery if there is foetal distress or if augmentation fails. Appropriate action for correction of primary inefficient uterine activity could be amniotomy and/or oxytocin infusion (i.e. augmentation of labour).

Although the alert and action lines were originally designed for primigravidas, Philpott also used them in the management of the multigravidae, who normally progress more quickly than the primigravidas. However, as he noted, "the difference in application occurs at the time of crossing the action line, for the use of oxytocic augmentation can be harzadous in the multigravid patient."

Hendricks et al. [19] proposed designating time of arrival at hospital rather than reported time of onset of labour as zero (0) time and this concept has been included in the commonly used partogram. No differences in progress of cervical dilatation rates have been observed among the different racial groups studied, therefore the basic concepts of the partogram are universally applicable.

Studd [20] based his work on that of Hendricks et al. [19] brought proposal of including admission dilatation of cervix, as it was more appropriate to relate expected progress of labour, to admission dilatation of the cervix. He drew five slopes or normograms representing normal labour in patients admitted at any of the five different values of cervical dilatation (i.e. 0-2, 3-4, 5-6, 7-8, 9-10 cms). If the patient's cervimetric progress strayed two hours to the right of the normogram, labour was adjudged at that stage to be prolonged, requiring acceleration.

Philpott [21] recommended that the interval between alert and action lines be shortened to 2 hours based on retrospective evaluation. It was evidenced that mother and foetus were safe even if intervention was delayed for 2 hours beyond the alert line but beyond 2 hours mark, foetal distress was more marked and some cases of disproportion missed. Philpott's [21] graph was divided into 2 separate portions. First part for the latent phase of 8 hours until cervix is 3 cm dilated and next part from 3 cm mark upwards at a slope of 1cm/hour to full dilatation and action line 2 hours to its right.

In 1988, WHO modified and adopted the partogram, and recommended it for worldwide use in all healthcare settings. WHO in 2000 revised the partogram omitting latent phase and commencing active phase at 4 cm dilatation [22-26].

1.2 Problem

From the description of the partogram it is evident that education and training for its competent use is very necessary [27-29]. The lack or limited knowledge of this very important tool in midwifery exposes child bearing mothers during labour at serious risk [30]. Sometimes it may not even be lack or limited knowledge of the use of the tool but it may complete ignorance of its existence. This has been observed and experienced that there is inadequate care of mothers in intrapartal periods at maternity units, where the partogram was not filled, incompletely filled or filled in retrospect. This raised a lot of questions such as: is it that the birth attendants (BAs) do not have the required knowledge? Is it that the type of health facility is responsible? Is it that knowledge is related to the profession or years of service of the birth attendant? and many more. These questions were the main reason why the research was undertaken.

1.3 Questions

1. What is the professional and age distribution of the BAs at the study site?
2. What is the status of the various health facilities at the study site?
3. What is the level of knowledge of BAs on the use of the partogram?
4. What is the relationship between level of knowledge of trained and untrained health staff on partogram use?

1.4 Hypothesis

The lack of knowledge is not statistically significant in the non use of the partogram by birth attendants use the partogram at the Bamenda health district.

1.5 Objectives

1. To identify the professional and age distribution of the BAs at the study site.
2. To assess the status of the various health facilities at the study site with BAs.
3. To assess the level of knowledge of BAs on the use of the partogram as a tool in midwifery.
4. To determine the relationship between level of knowledge of trained and untrained health staff on partogram use.

2. MATERIALS AND METHODS

Descriptive cross sectional study that was carried out at six sites which all had good delivery output and the number of qualified birth attendants, and had the partogram which is supposed to be a decision making instrument. The study population was made up of doctors, reproductive health nurses, midwives, nurses and other personnel who were attending to women in labour.

For inclusion criteria, we included all the personnel working in the delivery and postpartum wards. They were those who participated in the follow up and delivery of pregnant women who accepted freely to participate in the study. Students on internship and other permanent health care workers who had nothing to do with the delivery process were also excluded. Hence the purposive sampling method was used whereby every one charged with the labour and delivery process were included in the study making use of the 76 participants. The data collection process began with pre-test of the instrument after authorization had been obtained from the appropriate authorities. Visits were paid to each institution and BAs were identified. Short meetings were organized in collaboration with the heads of services to explain the study and how the questionnaire could be filled. The questionnaire was distributed and each participant was expected to complete and drop it in a box that was kept in the office of the service head. The questionnaire was in English. For validity and reliability, the questionnaire was pretested at a distant health centre. Some ambiguous questions were rephrased after the pilot study. To complement, visits were made to observe how the partograms were being filled and also to motivate personnel to fill the questionnaire.

A semi-structured questionnaire divided into four sections representing the objectives of the study.

In order to produce a more objective assessment of knowledge of the partogram and its level of utilization, a scoring method was devised and a knowledge score for each of the respondents was obtained by adding up the scores for correct answers given to questions under the specified section. A written informed consent was obtained from each participant. Ethical clearance was obtained from the Cameroon Bioethics Initiation which approved the science and the ethics of the research before it could be conducted. Without this ethical clearance, the research would not have taken place in Cameroon.

Data was analysed with the use of EPI Info 3.3.2 and X^2 test was used to associate various findings with a p value was set at $p<0.05$ for any statistically significant relationships.

Knowledge on partogram use was scored on 55 with those having scores of 44 and above, classified as having a satisfactory level of knowledge on partogram use, 30 to 43 as average and those below 30 as having an unsatisfactory level of knowledge on partogram use.

3. RESULTS

The results have been presented based on the respond to research questions and the serial flow of the objectives (professional distribution of participants, age, status of health facility, onwards).

Out of a total of 76 participants of 3 (3.9%) general practitioners - GP, 5 (6.6%) were midwives-MW, 31(40.8%) were registered

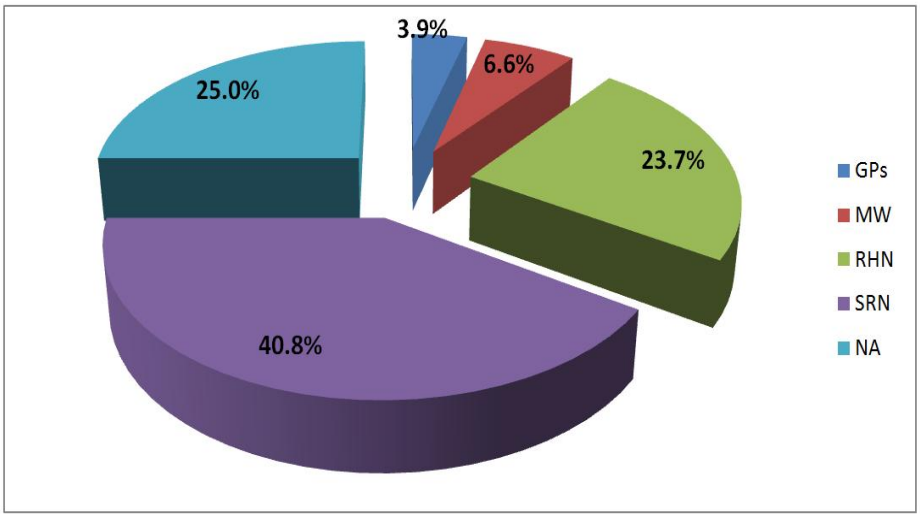

Fig. 1. Professional distribution of respondents

nurses-RN, 19(25.0%) nurse assistants-NA, while 18 (23.7%) reproductive health nurses-RHN (Fig. 1 above).

The distribution of participants by age across the disciplines showed 18 (23.7%) being between the ages of 26-30 years, 16 (21.1%) missing data, 15 (19.7%) 31-35, 14 (18.4%) 36-40, 2(2.6%) 41-45, 9 (11.8%) 46-50, and 2 (51-55). These ages were matched with the professions as on Table 1.

The ages of the respondents ranged from 26 to 50yrs. Most of the participants who indicated their ages were below 30 yrs old (18). The participants that were above 53 yrs of age were all RHN. The age range of the MW that indicated their ages were between 47 and 48 yrs of age. Meanwhile the GPs had an age range of 26 to 38.

The nine health facilities were comprised of tertiary, secondary and primary health provision activities to women in labour and delivery. These were termed the status of the health facility and matched with the various professionals who assisted mothers with labour and delivery.

Table 1. Age distribution of participants

Age (years)	GPs	MW	SRN	RHN	NA	Total
Missing	0	2	4	4	6	16
26 - 30	2	0	10	0	6	18
31 -35	0	0	8	5	2	15
36 - 40	1	0	6	4	3	14
41 - 45	0	0	1	1	0	2
46 - 50	0	3	2	2	2	9
51- 55	0	0	0	2	0	2
Total	**3**	**5**	**31**	**18**	**19**	**76**
Range	**26 -38**	**47-48**	**25-50**	**32-53**	**23-47**	**23-53**
Mean±SD	**38.0±6.66**	**46.7±0.6**	**33.8±6.7**	**40.1±7.6**	**34.1±7.5**	**35.9 ±7.8**

Table 2. Status of health facility of participants according to their profession

Status of health facility	GPs	MW	SRN	RHN	NA	Total
Tertiary	0	2	5	3	0	10
Secondary	3	0	17	7	11	38
Primary	0	3	9	8	8	28
Total	**3**	**5**	**31**	**18**	**19**	**76**

Out of the 10 participants from the tertiary level, 5 of them were SRNs, 3 were RHNs and 2 were MWs. No NA was working at this level. While in the secondary level, 17 were SRNs, 11 were NAs, 7 RHNs, 3 GPs and no MW. While, at the primary level, there were 9 SRNs, 8 RHNs, 8 NA and 3MWs.

There was a statistically significant relationship between professional level of respondents and their knowledge on partogram use (F-statistics= 3.13, p=0.013) with NAs having the least mean score (37.9±5.9) and GPs the highest (52.0±0.0). However, there were 7 (9.2%) NAs who had satisfactory score of knowledge. Overall, 61.8% of the respondents had satisfactory level of knowledge on the use of the partogram.

Years of working experience were studied from all the participants and found to range from less than five years to over 20 years (Fig. 2).

More than half of the respondents -43 (56.8%) had been working in the labour ward for less than 5 yrs, and 22 (28.9%) of them have been there for between 5 and 10yrs with only 1 (1.3%) has been working in the labour ward for more than 20 yrs.

The years of working experiences were matched with satisfactory or unsatisfactory use of the partogram as shown on Fig. 3.

There was no statistical significant relationship between knowledge on partogram use and years of experience either at the labour ward or total years of work (X^2=10.3449, df=8, p=0.2417).

The care provision was compared to the status or level of the health facility and matched with satisfactory or unsatisfactory as shown on Fig. 4.

Level of knowledge amongst respondents increases generally but not significantly (X^2=6.3123, df=4, p=0.177) from primary to tertiary levels of care with the mean level of knowledge at the tertiary, secondary and primary level being 43.4, 41.1 and 38.7 respectively.

The various personnel who were participants in the study were assessed for knowledge on the use of the partogram and matched to satisfactory or unsatisfactory (Fig. 5).

Table 3. Showing level of knowledge against professional level

Score of knowledge	GPs		RHN		MW		SRN		NA		Total	
	n	%	n	%	N	%	n	%	n	%	n	%
Satisfactory	3	100	16	89	3	60	18	58	7	37	47	62
Average	0	0	2	11	1	20	11	35	10	53	24	32
Unsatisfactory	0	0	0	0	1	20	2	6	2	11	5	7
Total	**3**	**100**	**18**	**100**	**5**	**100**	**31**	**100**	**19**	**100**	**76**	**100**
Range	**44.0-52.0**		**32.0-51.0**		**27.0-50.0**		**17.0-47.0**		**26.0-47.0**		**17.0-52.0**	
Mean±SD	**48.7±4.2**		**44.1±4.4**		**42.0±9.6**		**39.2±6.8**		**37.9±5.9**		**40.4±6.9**	

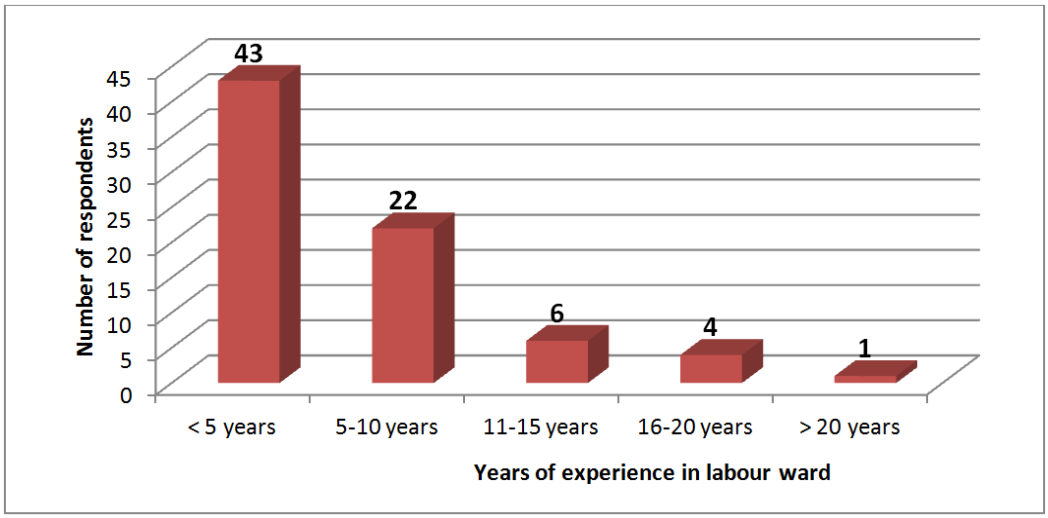

Fig. 2. Year of work experience

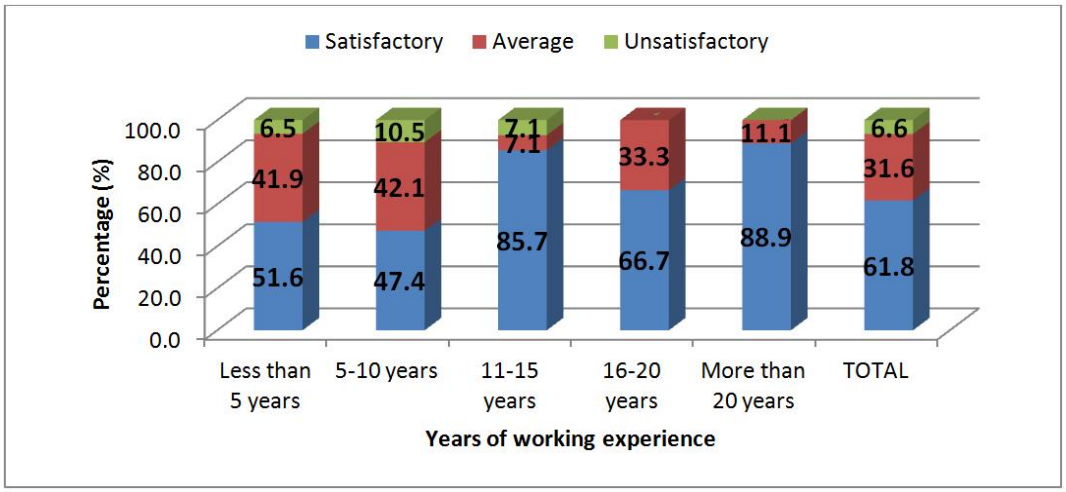

Fig. 3. Comparing level of knowledge against years of experience

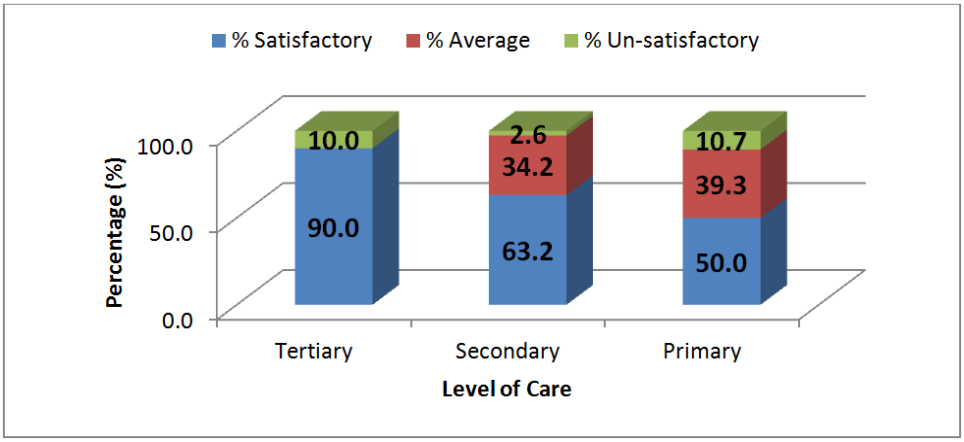

Fig. 4. Knowledge of personnel on partogram in health facilities according to level of care

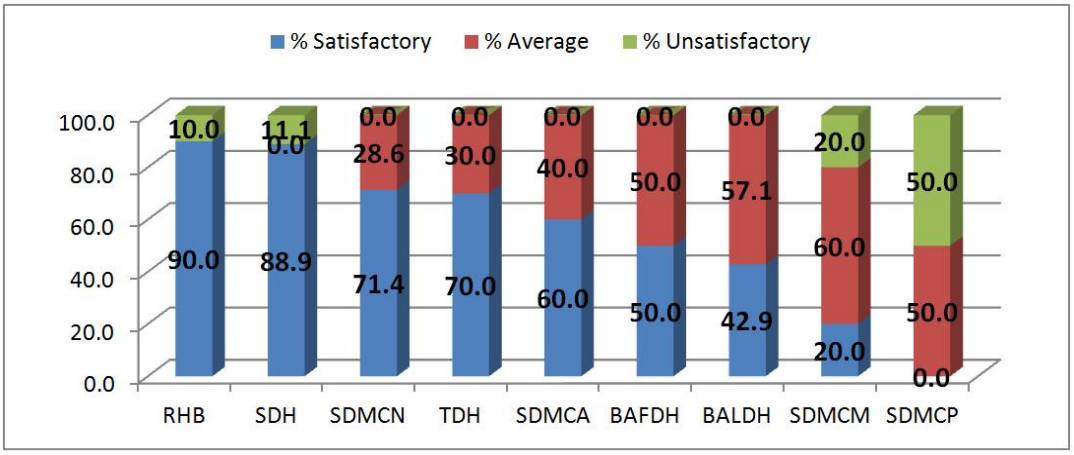

Fig. 5. Knowledge of personnel on partogram in health facilities

There was a significant statistical relationship between level of knowledge and the various health facilities when not graded according to level of care (X^2=34.2904, df=16, p=0.0050). Participants at secondary (SDH) have mean score just slightly below that of tertiary (RHB) (43.4) while primary level (SDMCP) had the lowest mean score of 26.8 with 0.0% of participants scoring a satisfactory score on partogram use.

Training on the use of the partogram was assessed and compared with performance of the participants (Fig. 6). This because it was probable that participants had not been trained on the use of the partgram formerly or informally.

There was a statistically significant relationship between level of knowledge and training on partogram use (X^2=6.8241, df=2, p=0.0422) with 66.7% of those who have received former training on partogram having satisfactory knowledge on partogram use compared to 36.4% of those who have not had former training on partogram use. For those who had received some training, the place was investigated (Fig. 7).

There was a statistically significant relationship between level of knowledge and where the participants were trained on partogram use (X^2=6.8241, df=2, p=0.0441) with 85.7% of those trained in school having satisfactory knowledge on partogram use compared to 54.8% of those trained in service.

Participants were assessed for training needs taking a look at knowledge of partogram use scoring as satisfactory or unsatisfactory with results as shown on Fig. 8.

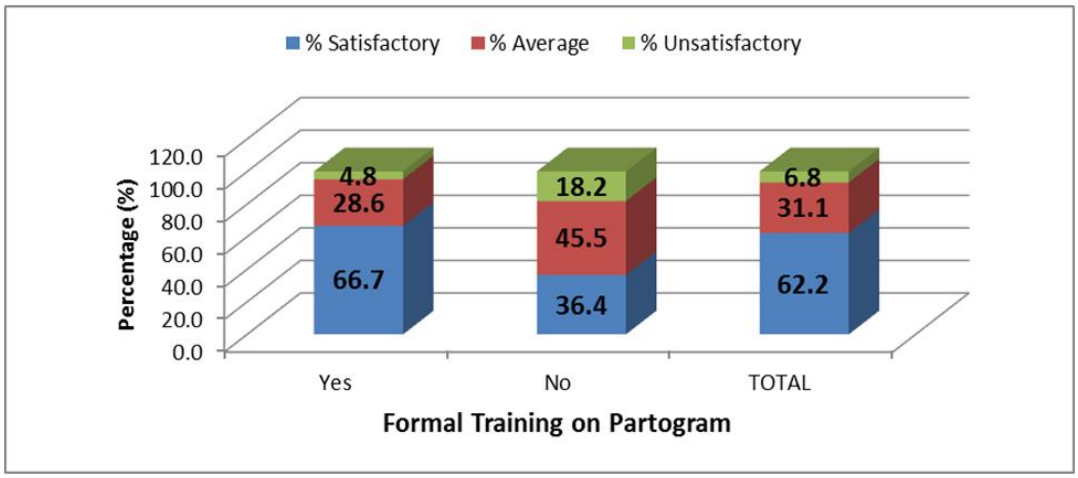

Fig. 6. Relationship between level of knowledge of trained and untrained health staff on partogram use

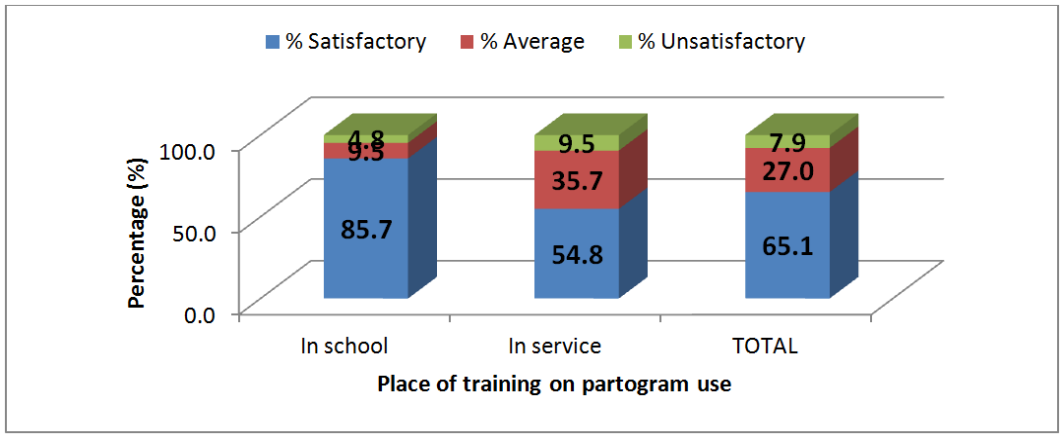

Fig. 7. Relationship between level of knowledge and place of training on partogram use

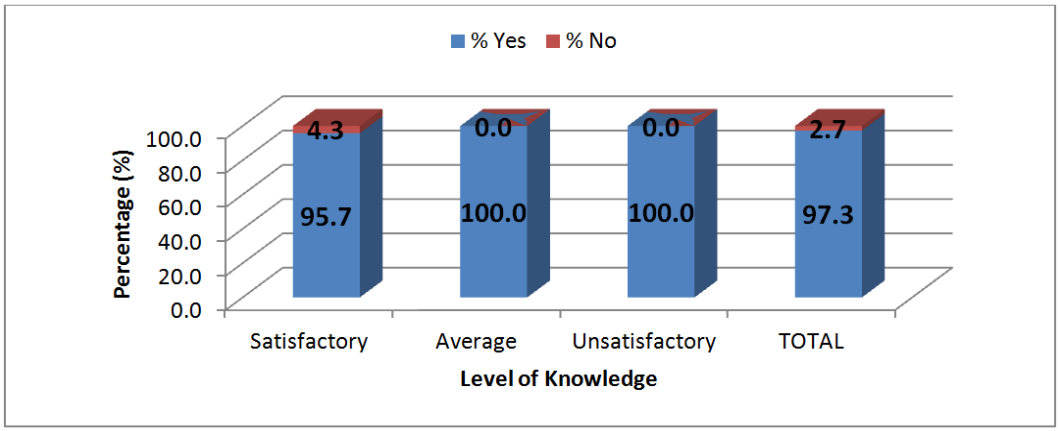

Fig. 8. Comparing training needs of heath staff with different levels of knowledge on partogram use

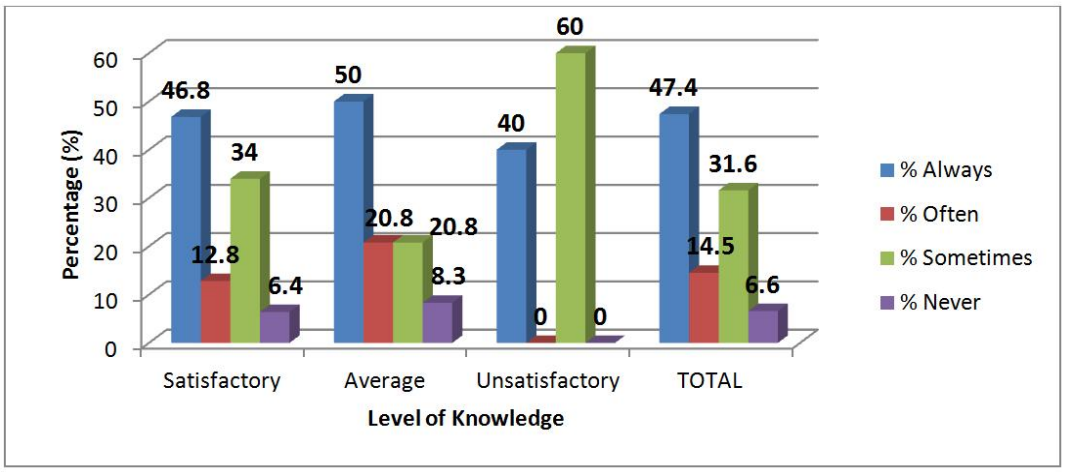

Fig. 9. Level of knowledge against frequency of utilization of partograms

There was no statistically significant relationship between knowledge and training needs (X^2=1.2241, df=2, p=0.5422) with 95.7% of those with satisfactory knowledge still expressing the need for training on partogram use compared to 100.0% of those with average and unsatisfactory knowledge on partogram use.

There was no statistically significant relationship between knowledge and utilization of partogram (X^2=4.2754, df=6, p=0.6395) with no specific pattern identified when utilization of partogram was compared between BAs with different levels of knowledge.

4. DISCUSSION

Although normal labour constitutes 80% of all deliveries [31] it is not risk free. Proportions of maternal deaths are attributable to direct and indirect complications of prolonged and obstructed labour [32]. Prolonged labour and delay in decision-making are important causes of adverse obstetric outcomes. In such settings, the partogram serves as a simple and inexpensive tool to monitor labour in a cost-effective way. Where the partogram has been used to manage labour, research has shown improvements in foetal and newborn survival as well as significant reductions in unnecessary interventions [33].

Out of the 76 participants, 47(61.8%) had a satisfactory knowledge on partogram use, 24(31.6%) had an average knowledge and 5(6.6%) had an unsatisfactory knowledge. This is different from other studies [34,35] where there were gross deficiencies in knowledge of majority of the nurses and half of the physicians. This

study had similar results to that of Dohbit et al. [16], where all physicians had satisfactory knowledge and only 5(6.6%) of the other participants had unsatisfactory knowledge of the partogram. It is therefore necessary that knowledge be improved and extended to all not that the participants were blank. The failure to use may then be linked to negligence or the lack of motivation to work.

There was a statistically significant relationship between professional level of respondents and their knowledge on partogram use (F-statistics=3.13, p=0.013) with the nurse aids having the least mean score (37.9 ± 5.9) and the doctors the highest (52.0 ± 5.2). This is a clear indication that recruiting nurse assistant and deploying them to areas of labour and child birth could be very dangerous though the majority of the participants were SRNs (31) with mean score of (39.2 ± 6.8) found to be below that of the MWs and RHNs. It is thus suggestive that, although other personnel could work in the labour ward, there may be need for them to be more of MWs and RHNs who unfortunately may not be available. The situation will likely improve over time as midwifery schools have been re-opened in the country. However, 36.8% of the NAs had satisfactory knowledge score indicating that low professional level staff can be trained to efficiently use the partogram. This can be related to the study carried out by Fatusi et al. [34].

There was a statistically significant relationship between level of knowledge and the various health facilities (X^2=226.1, df=10, p=0.04). Participants from the tertiary and secondary level had the highest level of knowledge with 90% and 88.9% respectively having satisfactory knowledge on partogram use, while the primary level had the lowest level of knowledge with no participant having a satisfactory score. One would quickly relate this to the fact that the partogram is not being used in these facilities, though availability may not be the main reason as few in the secondary level did not use the partogram as 60% of participants had a satisfactory knowledge on its use. However, there was no significant relationship between level of knowledge and utilization of the partogram. The study has demonstrated a significant relation between knowledge and partogram use where participants were trained, with 85.7% of those trained in school having a satisfactory score compared to 54.8% trained in service. This is similar to results obtained by Fawole et al. [30,36]. There is need therefore to make the in-service trainings on the partogram to be as close as possible to that obtained in school since this might ensure a better understanding of the partogram.

5. CONCLUSION

Knowledge of partogram has been found to be good especially amongst doctors and reproductive health nurses with respect to the partogram. Thus professional qualification enhances its use.

The utilization of the partogram was however low and this was related to training issues and unavailability of the partogram. The status of the health facility plays a role in the availability of the partogram and so invariably affects the utilization, as well as work experiences. The more time spent on the job, the more the ability to use the partogram.

6. RECOMMENDATION

1. The knowledge capacity of health care ptoviders should be improved by making available the patogram and its components to all staff.
2. Health facilities should ensure that the tool (patogram) is available to all staff.
3. Health facilities should endavour to recruit and redeploy professionals in the art and care of mother and child during labour and child birth.
4. Health factors irrespective of their statuses should ensure that the partogram is in place and ready for use.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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