Use of the partogram by doctors and midwives at Odi District Hospital, Gauteng, South Africa

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Background: There is scientific evidence that using the partogram reduces maternal and foetal morbidity and mortality. The use of partograms by doctors and midwives at Odi District Hospital has been reported as inadequate by external audits. The level of knowledge of and use of partograms amongst doctors and midwives at Odi District Hospital was investigated.

Methods: A cross-sectional survey of doctors and midwives was undertaken using a self-administered questionnaire. A mixed-methods research approach was used to elicit information on the knowledge and use of the partogram.

Results: Despite 57 (83.8%) participants having had some form of training on the partogram, only 54 (79.4%) routinely used it. All but one participant had heard of the partogram. Reasons for not using the partogram included being unsure how to use it (13%), partogram charts not available (8.7%), partogram takes too long (21.7%), being too busy (26.1%), and a feeling that the partogram was not the doctor's responsibility (26.1%). Overall knowledge of partograms was insufficient, resulting in inadequate use of partograms. In-service training is required to improve the skills of doctors and midwives in the correct knowledge and use of partograms.

Conclusion: Partograms are not used as required by doctors and midwives, and further training is needed.

Keywords: district hospital, doctors and midwives, in-service training, knowledge and use of partograms, partogram

Introduction

South Africa reports an unacceptably high rate of maternal deaths of 138 per 100 000 live births.1 Gauteng province is ranked second to KwaZulu-Natal, with maternal deaths at 138.3.2 Evidence points to a 44% decline in the global maternal mortality rate, from 385 to 216 deaths per 100 000 live births between 1990 and 2015.3 This significant achievement is attributed in part to the use of the partogram to improve labour management. The Safe Motherhood Initiative concluded that use of the partogram reduced maternal and foetal morbidity and mortality, especially in under-resourced countries.3,4

The clinical value of the partogram depends on accurate observations, correct completion of the partogram and effective application of findings for effective clinical decision-making.10–12 The partogram or labour graph is used to map the cervical dilatation against time and thus unsatisfactory progress of labour can be identified and managed timeously.5 The inclusion of the partogram in the labour book follows a recommendation that all facilities providing delivery services should use partograms.4,15

Methodology

Study design

A descriptive cross-sectional survey of doctors and midwives was undertaken at Odi District Hospital. This hospital has 49 maternity beds and provides maternity services and care to the...
surrounding rural areas. The staff complement includes advanced midwives, midwives, enrolled nurses, nursing assistants, full-time medical officers and visiting specialist obstetricians. A wide range of maternity services is provided at this site, including antenatal and postnatal care and prevention of mother-to-child transmission of HIV.14,15

A self-administered questionnaire was distributed by the researcher and completed by all eligible participants. Since this study was a census, no sampling was done. Data were collected on sociodemographic variables (age, gender and experience) and the participants’ level of knowledge about the partogram and how they use the partogram, from February 1, to March 31, 2015. Data were analysed using the Statistical Package for Social Sciences software (SPSS version 23.0©, IBM Corp, Armonk, NY, USA).

Data-collection instrument and scoring

The questionnaire was based on the Guidelines for Maternity Care in South Africa14 and included three themes: (i) knowledge about the use and implications of the partogram; (ii) knowledge regarding an abnormal partogram; and (iii) knowledge about completion of certain parameters on the partogram. There was a total of 20 items (questions). Responses for questions included yes or no answers, and options rated agree, disagree or unsure. In order to produce a summation of themes and overall score for partogram use, a scoring method was devised. Each correct response was given a score of 1 and an incorrect response a 0 score, and these were converted into percentages.

For each section on knowledge the scores of the items were added and the total divided by the number of items, giving the mean score for the section. The theme and total scores were further categorised into two groups, based on levels of competence. The first group had a total score below 75% and the second group a score of 75% and above. According to the World Health Organization,17 trained and skilled healthcare workers are expected to be competent in the use of the partogram, be able to examine a pregnant woman, document findings on the partogram and interpret those findings.

Univariate descriptive data analysis summarised the variables according to measures of central tendency (mean, mode, median), measures of dispersion, range and standard deviation, as well as frequencies. Chi-square and Student’s t-tests were used to test hypotheses concerning association of variables. All the inferential statistical test results were considered significant if \( \alpha = 0.05 \) or \( p < 5\% \). Data from the open-ended question were analysed using thematic content analysis.

The research was approved by the Sefako Makgatho Health Sciences Research and Ethics Committee (MREC/M/332/2014: PG). Permission to conduct the study at the site was given by the CEO of Odi District Hospital, and participants completed informed consent prior to entering the study.

Results

Demographic profile of study participants

A response rate of 97.2% \((n = 69)\) was achieved in this study. Two non-respondents included a doctor on maternity leave and another who refused to participate. The majority of the participants were doctors (53.6%; 37), of whom 23.2% (16) were medical officers, 18.8% (13) family medicine registrars, 8.7% (6) community service doctors and 2.9% (2) specialists.

### Table 1: Demographic profile of the participants

| Variable                  | Frequency | %  |
|---------------------------|-----------|----|
| Professional category     |           |    |
| Nurses                    | 32        | 46.4|
| Doctors                   | 37        | 53.6|
| Sex                       |           |    |
| Male                      | 27        | 39.1|
| Female                    | 42        | 60.9|
| Age (years)               |           |    |
| 35 and younger            | 26        | 37.7|
| Between 36 and 49         | 29        | 42.0|
| 50 and over               | 14        | 20.3|
| Experience \((n = 66)\) in years |       |    |
| 5 and less                | 19        | 28.8|
| Between 6 and 10          | 23        | 34.8|
| 11 and over               | 24        | 36.4|
| Total                     | 69        | 100|

The average age (SD) was 40.09 (9.89) years, with most participants (42%; \(n = 29\)) between 36 and 49 years of age. Almost two-thirds (63.6%; \(n = 42\)) of the participants had worked for 10 years or less (Table 1).

Use of the partogram amongst doctors and midwives

All participants except one (98.6%; \(n = 68\)) had heard of the partogram, and 83.8% \((n = 57)\) had received training on the partogram — during their undergraduate training in 60.4% \((n = 35)\), or during in-service rotations (22.4%; \(n = 13\)). Over two-thirds (79.4%; \(n = 54\)) of participants routinely used the partogram. A variety of reasons were cited for not using the partogram, including being too busy (26.1%; \(n = 6\)), the partogram taking too long (21.7%; \(n = 5\)), and feeling that the partogram should be completed by the nurses (26.1%; \(n = 6\)) (Table 2).

Knowledge of the partogram amongst doctors and midwives

Generally participants knew about the partogram and its role in monitoring women in labour. Almost all of the participants (89.9%; \(n = 62\)) knew when to start using a partogram. However, less than half (47.8%; \(n = 33\)) were aware that a correct diagnosis of labour had to be made before recording the partogram. Many participants (15.9%; \(n = 11\)) thought that use of the partogram increases the number of women having prolonged labour. A majority of participants, (69.6%; \(n = 48\)) knew that the latent phase of labour should not be longer than 8 hours (Table 3).

In evaluating the participants’ knowledge about assessment of women with poor progress in the active phase of labour, it was found that only 11.6% \((n = 8)\) specified that labour is prolonged if the cervix dilates at a rate of less than 1 cm/hour. The majority of participants (97.1%; \(n = 67\)) were of the opinion that the rule of 4Ps (patient, powers, passage, passenger) should be used to assess and manage patients with poor progress in the active phase of labour and to exclude cephalopelvic disproportion (85.5%; \(n = 59\)), and that intact membranes should be ruptured (88.4%; \(n = 61\)). Sixty-three (91.3%) agreed to exclude malpresentation as a possible cause of poor progress, and 87% \((n = 60)\) would start oxytocin infusion if there were no contraindications.
Participants lacked confidence and working knowledge regarding the symbols and codes used to record events on a partogram. This was found when the participants were asked to draw the symbols and codes for foetal heart rate, cervical dilatation, moulding and type of liquor partogram. As many as 76.8% (n = 53) did not know how to plot the foetal heart rate on the partogram, and 97.1% (n = 67) could not plot moulding of skull bones.

**Comparison of general knowledge of the partogram and demographic characteristics**

Based on the results shown in Table 4, the general knowledge of the partogram seems to be similar irrespective of profession (p = 0.83), gender (p = 0.41), age group (p = 0.59), and clinical experience (p = 0.90). Despite lack of statistical significance (p = 0.067), more nurses than doctors had better skills and knowledge of the partogram. Clinical application of the partogram improves with years of experience in the maternity unit. Participants with clinical experience of over six years were significantly more knowledgeable in the application of the partogram than those with less experience (p = 0.026). Association of knowledge of what needs to be completed on the partogram and demographic variables was insignificant for age, gender, profession and years of experience (Table 4). Similar findings were reported on overall knowledge of the partogram and demographic parameters (Table 5).

**General comments from participants regarding the use of the partogram**

In this section participants were asked if they had any other comments regarding the use of the partogram. Half of all the participants (35; 50.2%) responded, and four themes emerged:

1. The partogram is poorly used; in-service training is needed; doctors do not plot the partogram; and spoiled partograms received from local clinics (Table 6).

2. The study population is mostly less than 49 years of age, and thus we assume their clinical experience of less than 10 years (63.6%) is still developing, similar to reports in Ethiopia and Ghana.15,16 This indicates that this cohort is young and therefore has an adequate opportunity to improve on their knowledge and application of the partogram within maternal services. The high rate of females in our study reflects a global gender bias that pervades distribution of the workforce in maternity units.6,17

3. Based on the results shown in Table 4, the general knowledge of the partogram seems to be similar irrespective of profession (p = 0.83), gender (p = 0.41), age group (p = 0.59), and clinical experience (p = 0.90). Despite lack of statistical significance (p = 0.067), more nurses than doctors had better skills and knowledge of the partogram. Clinical application of the partogram improves with years of experience in the maternity unit. Participants with clinical experience of over six years were significantly more knowledgeable in the application of the partogram than those with less experience (p = 0.026). Association of knowledge of what needs to be completed on the partogram and demographic variables was insignificant for age, gender, profession and years of experience (Table 4). Similar findings were reported on overall knowledge of the partogram and demographic parameters (Table 5).

4. The partogram is a universal tool for monitoring labour, similar to the findings in a study in Ghana.16 The majority (89.9%) stated that plotting the partogram should start when a woman is in labour, compared with 40.0% in Ghana.16 Even though the participants had good knowledge about what the partogram is and its importance in the management of prolonged and obstructed labour, they did not know the symbols

**Discussion**

The study population is mostly less than 49 years of age, and thus we assume their clinical experience of less than 10 years (63.6%) is still developing, similar to reports in Ethiopia and Ghana.15,16 This indicates that this cohort is young and therefore has an adequate opportunity to improve on their knowledge and application of the partogram within maternal services. The high rate of females in our study reflects a global gender bias that pervades distribution of the workforce in maternity units.5,17

This study revealed that almost all of the participants were familiar with the partogram being a universal tool for monitoring labour, similar to the findings in a study in Ghana.16 The majority (89.9%) stated that plotting the partogram should start when a woman is in labour, compared with 40.0% in Ghana.16 Even though the participants had good knowledge about what the partogram is and its importance in the management of prolonged and obstructed labour, they did not know the symbols
A majority of the participants (79.4%) routinely use the partogram, which was higher than in Ethiopia (40.2%) and Nigeria (5 to 33%). Human resources shortages pose a serious threat to the provision of comprehensive health services, especially in low-resource settings. Maternity wards are often understaffed, and personnel may not have adequate experience and time to complete the partogram. In our setting participants were unable to complete the partogram largely because they do not have time, and doctors considered it the nurses’ responsibility to fill in the partogram. These reasons pertaining to understaffing and its effects are universal justifications given in particular by doctors regarding their failure to use partograms. Over 25 years ago the World Health Organization declared the partogram to be an essential tool for monitoring and management of labour. Despite established evidence of safe and successful labour with the use of the partogram, this tool remains inconsistently and incorrectly applied and used. Most undergraduate training includes the use of the partogram, yet students tend to be less involved. We suggest radical curriculum changes, where students develop and maintain their own partogram records, and monitor and suggest appropriate interventions under supervision. Once qualified, graduates need to undertake regular practical refresher courses on the use of partograms. Used when plotting on the partogram (e.g. FHR, MSL and moulding). This will have a negative impact on their ability to plot and interpret abnormal findings. We attribute this poor level of knowledge to inadequate exposure, insufficient and infrequent in-service training of personnel, and lack of support and guidance. This situation has previously been cited as contributing to non-use of partograms. The plotting of the partogram may be difficult and challenging for the untrained healthcare professional. Cumulatively, challenges with plotting the partogram lead to doctors and midwives being resistant to this task.
Facility-wide audits are critical, because use of the partogram should be integrated into the ethos of the institution as a mandate by the South African Department of Health, and not be relegated to individual preference. It is with this understanding that the leadership of the institution is likely to provide the necessary infrastructure and resources needed to establish the use of the partogram as a routine and necessary practice. Monitoring and evaluation of the partogram in institutions is critical for assessment of performance and reinforcement of learning and good performance.

Limitations of the study
The small sample size predisposes our findings to random error; however, the methodological rigour incorporated in this study minimises threats to validity. Our study was a census, which provides a complete picture of the use of partograms at Odi District Hospital. We found similarity with larger studies, which most likely makes our findings generalisable to similar settings.

Conclusion
Despite having inadequate knowledge about the partogram, the majority of doctors and midwives continue to use this tool regularly. It is encouraging that there is willingness and understanding that the partogram is essential and should be used once the woman is in labour. Management should provide leadership and adequate support to staff in order to improve knowledge and application of the partogram. Regular audits should be scheduled and implemented to increase uptake and proper implementation of the partogram at Odi District Hospital to improve the quality of intrapartum care.

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