

Midwives' Perceptions Regarding the Use of the Cardiotocograph Machine as an Intrapartum Monitoring Tool in Namibia: A Qualitative Research Study

Laura Uusiku¹, Sindiwe James², Israel Sonti² & Olivia Tuhadeleni³

¹ Department of Midwifery Science, School of Nursing, Faculty of Health Sciences, University of Namibia, Oshakati campus, Namibia

² Department of Midwifery Sciences, School of Nursing, Faculty of Health sciences, Nelson Mandela University, South Africa

³ Department of community Health Nursing Science, School of Nursing, Faculty of Health Sciences, University of Namibia, Rundu campus, Namibia

Correspondence: Ms Laura Ingashipwa Uusiku, School of Nursing, University of Namibia, P.O.BOX 2653, Elliander Mwatale Street, Oshakati, Namibia, Tel: 65- 223-2261. E-mail: luusiku@unam.na

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Abstract

Although, at the time of this study, the cardiotocograph machine was the acceptable monitoring tool to be used intrapartum, its appropriate use was a matter of concern for midwives globally. This article reports the findings of a qualitative study which investigated the perceptions of midwives, who were working in a labor ward in a public referral hospital in Namibia, regarding the use of the cardiotocograph machine. The objectives of the study included: to explore and describe the perceptions of midwives working in a labor ward in Namibia regarding the use of the cardiotocograph machine as a labor monitoring tool; and to explore and describe how midwives working in a labor ward in Namibia perceived informing women who were in labor about the use of the cardiotocograph machine as a labor monitoring tool.

The study site was a public referral hospital which offered services to the five northern regions of Namibia. The requisite data was collected using semi-structured, one-on-one interviews which were conducted with seventeen (17) purposively selected participants. The interviews were recorded on an audio device. The spiral method of data analysis was adopted. The study findings revealed that the participants had varying perceptions on the use of the cardiotocograph machine intrapartum and, as such, perceived its use as a challenge. It was concluded that midwives need to be empowered via refresher courses with regard to the use of cardiotocograph machine to ensure optimum results.

Keywords: cardiotocograph machine, intrapartum monitoring tool, Namibia

1. Introduction and Background

Labor is stressful for both the mothers and the midwives. The pressure on the midwives arises from their knowledge regarding the birthing physiological stress experienced by both the mother and the fetus while the mother must also meet the expectations of the family. In addition, Sowmya et al. (2013) also highlight that the health of the fetus and of the mother who is in labor are inextricably linked. It is for these reasons that intrapartum monitoring becomes crucial and, hence, the importance of the role played by the cardiotocograph (CTG) machine. Health facilities in Namibia moved from using the fetoscope to the cardiotocograph machine in response to the unexpected complications that may occur during labor.

According to Chudacek et al. (2014), cardiotocograph monitoring is a globally accepted, safe and reliable method of assessment of fetal wellbeing intrapartum and is used mainly for diagnostic purposes, especially in relation to the fetal heartbeat and the nature of the uterine contractions. In addition, health professionals in the USA of the opinion that the use of the cardiotocograph machine is safe and reassuring because it provides a record of the fetal condition in utero (Smith et al., 2012). In the United Kingdom, cardiotocograph monitoring is a commonly used form of fetal assessment in pregnancy because of its reliability although its routine use is not recommended in

order to avoid mismanagement during the intrapartum period (Gyte, 2015). Thus, mastering the principles regarding the use of the cardiotocograph machine would be of assistance to midwives as it would enable them to monitor both the fetal condition and labor (Sowmya et al., 2012). Mastering these principles would provide midwives with reassurance in relation to the required relief in respect of neonatal mortalities and, thus, represent a positive step towards the realization of the 2030 sustainable development goals (SDGs).

The cardiotocograph machine may be used either intermittently or continuously as an intrapartum monitoring tool, depending on the fetal condition (Rhose et al., 2014). However, it has been found that midwives are still using the cardiotocograph machine incorrectly intrapartum despite the frequent in-service training on its use which has been reported and the literature which has been made available to midwives. It is, nevertheless, understood that in-service cardiotocograph training would have positive results in relation to its correct use, thus effecting an improvement in fetal outcomes (Sowmya et al., 2014).

At the time of the study the incidence of neonatal mortality globally was reported to be 2.6 million, while the neonatal death rate for Namibia was 17, 8/1000 live birth (UNICEF Report, 2018). This statistic is significant in view of the fact that it is known that the rate of neonatal mortality and morbidity is alarmingly high in low income countries such as Namibia. On the other hand, neonatal morbidity in high income countries, such as America, is reported to be low with an average of 4 per 1000 live births while Sweden has the lowest neonatal morbidity globally, namely, a rate of 1.6 deaths per 1000 live births (UNICEF Report, 2018). In addition, neonatal mortality is declining in the United Kingdom (UK) which has a rate of 2.5/1000 live births (Drapper et al., 2018). Notwithstanding other measures put in place and the skills of the midwives, these statistics are also attributed to the use of cardiotocograph machines in these countries. Thus, it is recommended that the low income countries learn from these countries how best to use the cardiotocograph machine intrapartum, thereby reducing their rates of neonatal mortalities.

A further benefit of using the cardiotocograph machine correctly is the concomitant reduction in litigation and claims, thus saving governments considerable fiscal reserves. Midwives are, thus, encouraged to embrace the correct use of the cardiotocograph machine in all countries, but especially in the developing countries, to avoid such litigation. Accordingly, the aim of this article is to present the findings that emerged from the study which explored midwives' perceptions regarding the use of the cardiotocograph machine as an intrapartum monitoring tool in Namibia.

2. Design and Methods

The study used a qualitative, explorative, descriptive and contextual research design. The research population comprised midwives working in the labor wards in a public referral hospital in Namibia. Voice-recorded, semi-structured interviews were used to collect the requisite data from seventeen purposively and criterion based sampled participants. The criteria included the participants being registered and enrolled midwives who had been working in labor wards for more than six months prior to the data collection. The interviews were conducted in a private room close to the labor wards to ensure the immediate availability of the participants should an emergency occur in the labor wards. All the participants responded to the main question:

“Can you tell me how you feel about your use of the cardiotocograph on women in labor?”

An interview schedule was also used to facilitate the progress of the interview (Creswell et al, 2014). The interview sessions lasted for an average of 40 minutes each and involved an average of two days until the completion of the data collection process. Data saturation is determined by repetition of themes and no new information obtained (Brink et al., 2012:141). When repetition of themes occurred in this study the researcher concluded that saturation had occurred and that the sample size is now complete. Therefore the seventeen midwives who were interviewed formed the sample size of this study and were representing the whole population of Namibian midwives working at state hospitals who share their perceptions regarding the use of cardiotocograph as an informative labor monitoring tool.

A pilot study preceded the main study during which two participants from the same research site were interviewed. The data collected from these interviews was included in the main study as no methodological errors were identified during the pilot study although minor interview skill related errors did emerge (Creswell et al., 2014).

The demographic profiles of the seventeen participants who were interviewed are presented below:

Table 1. Demographic profiles of participants

Number of Participant	Age	Highest Qualification	Years of Experience	Position/rank	Language
1.	38 years	Diploma in Nursing	8 years	Registered nurse	Oshiwambo
2.	25 years	Degree in Nursing	3 years	Registered nurse	Oshiwambo
3	48 years	Degree in Nursing	4 years	Registered nurse	Oshiwambo
4.	29 years	Certificate in Nursing	1 year	Enrolled nurse	Oshiwambo
5.	27 years	Certificate in Nursing	7 years	Enrolled nurse	Oshiwambo
6.	44 years	Degree in Nursing	15 years	Registered nurse	Oshiwambo
7.	39 years	Diploma in Nursing	13 years	Registered nurse	Oshiwambo
8.	28 years	Certificate in Nursing	2 years	Enrolled nurse	Oshiwambo
9	30 years	Diploma in Nursing	5 years	Registered nurse	English
10.	52 years	Diploma in Nursing	29 years	Registered nurse	Oshiwambo
11.	51 years	Degree in Nursing	4 years	Registered nurse	Oshiwambo
12	28 years	Certificate in Nursing	1 years	Enrolled nurse	Oshiwambo
13.	35 years	Degree in Nursing	10 years	Advanced midwife	English
14.	30 years	Degree in Nursing	10 years	Advanced midwife	English
15.	45 years	Degree in Nursing	25 years	Advanced midwife	English
16.	38 Years	Diploma in Nursing	8 years	Registered nurse	Oshiwambo
17.	34 years	Degree in Nursing	2 years	Registered nurse	Oshiwambo

2.1 Analysis

The interviews were transcribed verbatim by the researcher who then used Creswell's spiral method of data analysis (Creswell, 2009:186). This method entails organizing all the data and reading it several times in order to get a sense of what it contains as a whole, identifying the general themes and summarizing the data in order to answer the research questions (Leedy & Ormrod, 2016). Copies of the original transcripts together with the guide used for the data analysis were forwarded to the independent coder for data analysis (Creswell, 2015). The independent coder was a qualified midwife with an advanced midwifery specialization qualification as well as a master's degree. In addition, the independent coder also had experience in both qualitative research design and in conducting interviews. A meeting was scheduled with the independent coder to finalize the data analysis and to come to a consensus. The researcher, supervisor and independent coder all agreed on the themes which had emerged.

2.2 Ethical Approval

The study was approved by the Faculty Postgraduate Studies Committee (FPGSC) which also accorded ethical clearance for the study to be conducted (**H16-HEA-NUR-006**). Furthermore, the Department of Health in Namibia as well as the hospital manager of the public referral hospital also approved the study in writing. Written informed consent for the interviews and permission to record the interviews were obtained from all the participants prior to the interviews. The names of the participants selected to participate in the study were not revealed to the nurse managers in an effort to ensure the privacy and confidentiality of the participants. In addition, the participants' names were not used in the report of the study findings. The participants were reminded of their rights in respect of voluntary participation in the study and also that they were free to withdraw from the study at any stage without any repercussions. Lastly, the participants were informed of the compulsory publication of an article by the researcher on the study but were assured that they would not be identified in the article.

3. Findings

The main themes that emerged were as follows:

- The midwives had varying perceptions regarding the use of the cardiocograph machine.
- The midwives still perceived the interpretation of the cardiocograph as a challenge and expressed the need for refresher courses.

- The midwives revealed that, in the main, they had limited communication with women in labor regarding the use of the cardiotocograph.

Theme 1. The participants had varying perceptions regarding the use of the cardiotocograph machine.

It was found that, as compared to the fetoscope, the participants perceived the cardiotocograph machine as a useful labor monitoring tool that assisted with the timeous discovery of complications. The participants also appreciated the use of the cardiotocograph machine as it saved them time and allowed them to attend to other patients while the machine was running. One midwife commented:

“So, I feel that the CTG is really helpful and, sometimes, it is like you do other things while the CTG is monitoring once you have attached the woman to a CTG” (P1)

The other participants also appreciated the use of the cardiotocograph machine based on its ability provide accurate and reliable results, thus assuring them of fetal wellbeing during the intrapartum period. However, it was also mentioned that such accuracy is guaranteed only if the CTG is properly used. They expressed their appreciation as follow:

“You will be able to ascertain the accurate FHR that is within the normal range as it has a digital screen and you will be able to see the numeration of the heart. It is also reliable and reassures the mother that the baby is ok as you explain the procedure to the mother” (P12).

However, some of participants were clearly irritated by the perceived abuse of the cardiotocograph machine

These participants expressed their dissatisfaction as follows:

“Besides, I think we are abusing the CTG machine because I think we can use it more in critical cases, for example, if we suspect fetal distress, then you can use it to confirm that but now people are abusing it” (P15)

“However, the disadvantage is that it confines the women to bed, also if the woman is contracting and there is that tie (pointing at the clip of the CTG belt), it could be irritating and you can see they are not comfortable” (P14)

Thus, although the participants clearly appreciated the use of the CTG tool, the study also found that the majority were experiencing difficulties with interpreting the cardiotocograph. It was also reported that such difficulties had the potential to prevent them from identifying abnormalities and applying measures to address the situation. Accordingly, the participants indicated the need for cardiotocograph refresher courses.

Theme 2. The participants still perceived the interpretation of the CTG as a labor monitoring tool as a challenge and expressed the need for refresher courses.

The majority of the participants reported that they were continuing to experience difficulties with the interpretation of the CTG while such difficulties reportedly had the potential to prevent them from identifying abnormalities and applying measures to address the situation. Accordingly, the participants indicated the need for cardiotocograph updates.

It emerged that most of the participants, especially those who were newly qualified, were still experiencing some difficulties with interpreting the cardiotocograph, although they relied on the doctors for an interpretation, at times they were not in agreement with the findings of the doctors. One participant stated:

“Yes, the doctors, you can call the doctor when you have a problem and they act if they want to act or they can keep on saying give another hour or so. We are not really in agreement with the doctors” (P14)

“Yes, because our level of understanding is not the same as that of the doctors and those with years of experience in the labor ward. Sometimes you are new from the university and you are not exposed to such things, thus we rely on doctors to interpret the cardiotocograph for us” (P14)

It is for these reasons that the participants expressed the need of in-service training in order to update their skills in relation to both the CTG and the cardiotocograph interpretation.

Theme 3. The participants revealed that, in the main, they had limited communication with women in labor women regarding the use of the CTG.

Although midwives are expected to provide detailed information to women in labor regarding the use of the cardiotocograph machine, the study found that they were not doing this as expected due to their own limited knowledge and skills. The participants had the following to say in this regard:

“Yes, briefly and shortly, just to my knowledge, I just tell them that I will put you on this machine to check the FHR of your baby. I cannot explain more because some of the things I also don't know” (P3)

Women in labor are always concerned about the wellbeing of the unborn fetus. A failure either to respond to this concern or to explain to them how they should behave while being attached to the CTG machine may result in unnecessary worries on their part which may, in turn, impact adversely on the progress of their labor.

4. Discussion

The findings of the study revealed that the participants had varying perceptions regarding the use of the cardiotocograph machine. It emerged that the majority of the participants appreciated the availability of the cardiotocograph machine as it could be used to monitor and detect abnormal fetal heart rates. However, this role was limited to their ability both to use the cardiotocograph and to interpret the results obtained from it. Indeed, Sajidah (2015) maintains that 80% of fetal deaths occur during the ante-partum period due to the lack of a proper diagnosis of fetal asphyxia caused by hypertension, diabetes mellitus or fetal congenital malformation. Women who are in labor and who suffer from such conditions require continual monitoring using the CTG (Kavanagh, 2015) as this will ensure both the early identification of complications and that the labor process is under control.

In the past midwives used a fetoscope to detect FHR. However, this has been replaced by the CTG machine (Hasting, 2015). Nevertheless, this transition requires skill in respect of both the use of the CTG and the interpretation of the CTG results in order to obtain the best results and this is creating problems for many of the midwives (Baber et al., 2013). In support of the importance of the correct use of the CTG Thellesen (2016) points out that errors in the management of fetal monitoring are the main cause of hypoxic brain injuries among newborns in cases of substandard care. Regular CTG training improves fetal outcomes as such training enables the users to master the skills involved in its use (Thellesen, 2016). However, according to the findings of this study such training is reportedly not happening in most Namibian hospitals and, thus, the midwives are experiencing difficulties in reading the CTG traces while neonatal mortality remains alarmingly high in Namibia.

Finally, the participants revealed that, in the main, they have limited communication with the women in labor regarding the use of CTG. This finding is supported by Mapute (2018) who indicated that the unlimited communication which was displayed by participants during the study was thought to facilitate participation during labor. However, it has been noted that, where interventions are required, most women would like to receive relevant information from competent health care providers delivered in a way which they are able to understand (WHO, 2018), thus alleviating unnecessary worries on their part which may impact adversely on the progress of their labor. Furthermore, women who are in labor appreciate and value effective communication as one of the key components of respectful maternal care (RMC) (WHO, 2018). Effective communication skills may be developed by training to improve the communication between midwives and women who are in labor.

4.1 Limitations

This qualitative study was conducted in one public hospital and, therefore, it is not possible to generalize the results to other public hospitals. In addition, the study focused on the perceptions of midwives only while their knowledge and experience were not taken account.

5. Conclusion

This study discussed the midwives' perceptions regarding the use of the CTG as a labor monitoring tool. At the time of the study CTG machines were being used in most public and private hospitals globally to monitor fetal and maternal wellbeing during labor. It emerged from this qualitative study on the perceptions of midwives that the participants claimed that the CTG is reliable. In addition, the midwives expressed the view that the CTG machine also saved time, especially when they had to monitor several women who were in labor. However, it was also found that the participants were experiencing challenges when they used the CTG machine, especially in relation to the interpretation of the CTG graph. Some of the midwives revealed that they lacked the skills required to interpret the CTG graph and that this deficiency needed to be addressed via continuous refresher courses. Several studies have highlighted that many of the high income countries, such as Sweden and the United Kingdom, are using the cardiotocograph machine effectively and that the machine has the potential to assist with the avoidance of the neonatal deaths. Consequently, the neonatal death rates are declining in these countries. Thus, low income countries with high neonatal death rates could use these countries as a benchmark. In addition, the CTG has been found to be the safest, fastest and most reliable machine that the midwives trust and on which they depend during the monitoring of labor. Another challenge which the participants highlighted was their inability to adequately explain the purpose of the CTG to women in labor. It is possible that this challenge is due to limited knowledge and skills on their part. However, a failure to explain to them how they must behave when being attached to CTG machine may cause the women unnecessary worry that, in turn, may have an adverse impact on the progress of their labor. It is, therefore, recommended that further research be conducted to ascertain the perceptions of women

in labor regarding the use of the CTG during their labor. Lastly, it was evident that there was a need for midwives to be empowered via refresher courses with regard to the use of the cardiotocography machine in order to ensure the best outcomes possible.

Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

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