

CLINICAL EXPERIENCE OF OXYTOCIN USE DURING SPONTANEOUS LABOR: A SURVEY OF MIDWIVES' PRACTICES IN THE BASIC MATERNITY UNITS OF KINDU

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Abstract

The administration of oxytocin during spontaneous labor is a common practice in the maternity hospitals of Kindu, but its practice by midwives in the province of Maniema in general and in the city of Kindu in particular is still problematic. The objective of this study was to identify the usual practices of midwives in Kindu maternity hospitals regarding the use of oxytocin during spontaneous labor. This was a descriptive cross-sectional study of 14 practicing midwives working in five maternity hospitals in Kindu, Maniema Province in Democratic Republic of Congo. We considered all of their staff because of their limited number (n = 14). This was an exhaustive non-probability sample. Inclusion criteria

- Being a midwife;
- To work in one of the maternity units targeted by the study

Any provider not meeting these criteria was not included in the study.

Data were collected using a questionnaire with 9 open and closed questions, encoded on Excel sheets and exported to STATA 14 software and processed using relative frequency calculations (percentages). Through this study, we found that midwives in the basic maternity hospitals of Kindu were performing acts contrary to the recommended scientific standards for the use of oxytocin during spontaneous labor. The vast majority of them (92.86%) did not know what to do in the event of cervical changes and/or 5 uterine contractions per 10 minutes; did not record the indication for oxytocin administration in the obstetrical record (78.57%); did not have a protocol for oxytocin use in their maternity units (57.14%) and did not have appropriate equipment for oxytocin administration

1. Introduction

Although medical and technological advances in maternity care have improved the care of pregnant women, parturients, and newborns in recent decades, there are still significant problems related to the use of oxytocin during spontaneous labor in the world at large, in the Democratic Republic of Congo, and in particular in the city of Kindu.

Discovered in 1909, oxytocin is a hormone produced by the hypothalamus, secreted in particular at the time of childbirth and during breastfeeding. It acts on uterine smooth muscle to stimulate contractions during labor (cervical dilation, fetal expulsion) and immediately after delivery to reduce the risk of postpartum hemorrhage (National College of Midwives of France, 2018).

The use of oxytocin during spontaneous labor is a common practice in birth rooms, used appropriately, it can be a life-saving procedure, but when used routinely, without a valid indication, it becomes dangerous and can cause adverse health effects to the woman and the fetus.

More than 60% of women in the world receive oxytocin to accelerate labor and thus reduce its duration (Cécile Thibert, 2016). In France, for example, 64% of women received oxytocin during labor and artificial rupture of membranes in 51% of women in spontaneous labor. (Belghiti *et al*, 2010). The rates of oxytocin use during labor in Brazil was 59.5% (Vogt *et al*, 2011). 92, 7% of women in Chile had undergone obstetrical interventions of artificial rupture of membranes, oxytocin and epidural analgesia (Binfa *et al*, 2016). High frequencies of oxytocin use during effacement, dilation, and expulsion were also observed in Africa. In three urban areas in Africa, oxytocin was used in more than 20% of deliveries (Pierre Buekens, 2011).

The administration of oxytocin is not without danger, this product presents many maternal and fetal adverse effects: hyperkinesia of frequencies and intensities, uterine hypertonia, fetal suffering. However, the major complication remains maternal namely uterine rupture (Rousseau and Burguet, 2016). The use of oxytocin during labor was associated with an increased risk of postpartum hemorrhage with a dose-dependent effect, a risk of uterine hyper stimulation, exposing the mother and fetus to a risk of hypoxia and cesarean section during labor, and exposes the mother and fetus to adverse effects that can have short and possibly long-term consequences. (Belghiti *et al*, 2013, Satin *et al*, 2012 and Dupont *et al*, 2017).

In spite of all the evidence mentioned above, the use of oxytocin remains excessive, even commonplace in the basic maternity units of the city of Kindu in order to shorten the duration of labor, even for parturients in spontaneous labor. This abusive and non-consensual use of oxytocin is becoming dangerous and can cause harmful effects on the health of the woman and her birth experience. This constitutes, in our humble opinion, a serious reproductive and perinatal health problem that requires adequate solutions.

Throughout the health system in the Democratic Republic of Congo, studies on the use of oxytocin during spontaneous labor are almost nonexistent, and the medical literature has focused much more on the risks and complications of childbirth and the prevention of pregnancy-related deaths.

In the absence of reliable data in the country in general and in Maniema Province in particular on the use of oxytocin in the delivery room, a study was conducted in the maternity wards of the city of Kindu to determine the share of oxytocin use to accelerate labor among the interventions performed at delivery. This study showed that 35.72% of women received oxytocin during their labor. This study suggested strategies that could reduce the extent of these harmful interventions during labor and delivery, including further training of midwives on the judicious use of oxytocin, popularization of the World Health Organization's recommendations on intrapartum care for a positive birth experience, and sensitization of all health care providers on adherence to evidence-based medicine (Bakangana *et al*, 2021).

2. Objective

To identify the usual practices of midwives in Kindu maternity hospitals regarding the use of oxytocin during spontaneous labor.

3. Methodology

This was a descriptive cross-sectional study of 14 practicing midwives working in five maternity hospitals in Kindu, Maniema Province, Democratic Republic of Congo (Kasuku II, Lumbulumbu, Basoko, Mikelenge, and Kama II maternity hospitals). We considered all of their staff because of their limited number (n = 14). This is a non-probability exhaustive sample.

Inclusion criteria

- Being a midwife;
- To work in one of the maternity units targeted by the study

Any provider not meeting these criteria was not included in the study.

Data were collected using a questionnaire with 9 open and closed questions, encoded on Excel sheets and exported to STATA 14 software and processed using relative frequency (percentage) calculations.

4. Results

Table 4. 1: Individual characteristics of midwives

Individual characteristics	f	%
Age		
20 - 34 years old	3	21,43
35 years and over	11	78,57
Total	14	100
Gender		
Male	2	14,29
Female	12	85,71
Total	14	100
Level of study		
Graduate	1	7,14
Licence	13	92,86
Total	14	100
Seniority		
Less than 5 years	1	7,14
5 to 10 years	4	28,57
More than 10 years	9	64,29
Total	14	100

The most represented age group was 35 years and above (78.57%) and their average age was 41.6±8.1 years with extremes of 32 and 51 years. The vast majority of midwives were female (85.71%) and had a bachelor's degree (92.86%) with more than 10 years of service (64.29%).

As stated earlier in this study, the concept of "practice" is the set of acts that the midwife performs in accordance with or in violation of the rules, principles, and scientific standards related to the use of oxytocin during spontaneous labour.

Table 4.2 Preparation of oxytocin during spontaneous labour

Variable Question	Preparation of oxytocin during spontaneous labour (n=14)	
	One 5 IU ampoule of oxytocin diluted in 500ml of 5% serum glucose	One 5 IU oxytocin ampoule in slow IVD
How is oxytocin prepared in dynamic dystocia?	12 (85,71%)	2 (14,29%)

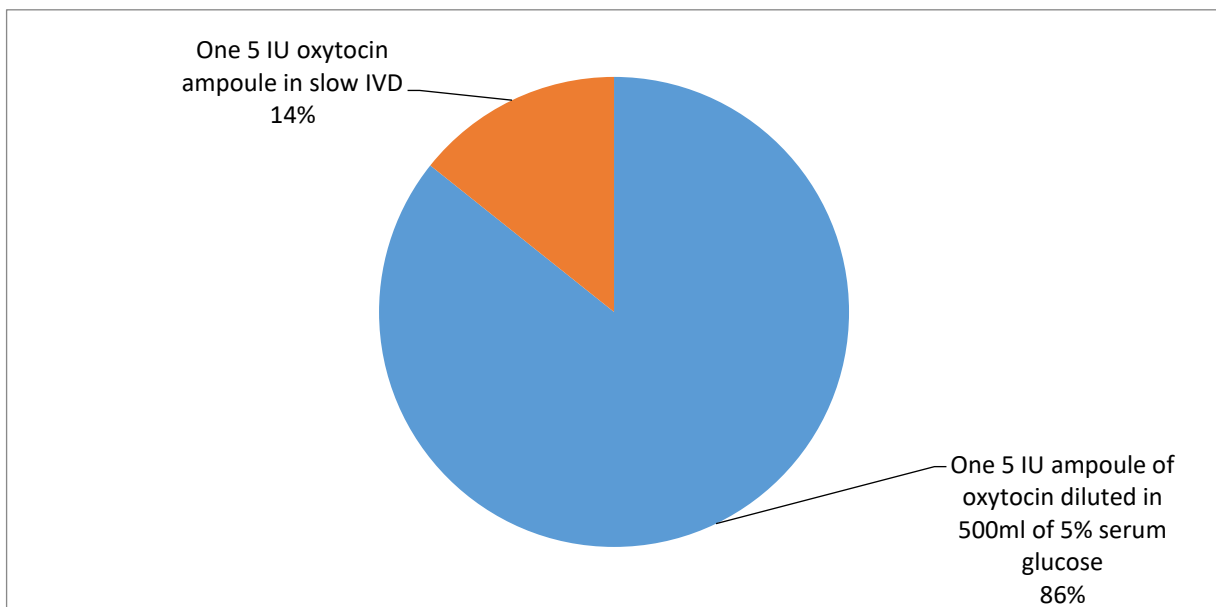


Figure 4.1 Preparation of oxytocin during spontaneous labour

Analyzing the results in in Figure 11 above, the vast majority of midwives mastered the preparation of oxytocin during spontaneous labour (85.71%) compared to 14.29% who did not master the preparation.

Table 4.3 Conduct during oxytocin administration

Variable Question	Conduct during oxytocin administration (n=14)				
	All answers are correct	Monitoring the fetal heart rate	Recording uterine activity	Observe the 30-minute intervals before each dose increase	Start at an initial dose of 20 IU per minute
What to do during oxytocin administration in labour?	8 (57,15%)	1 (7,14%)	2(14,28%)	1 (7,14%)	2 (14,28%)

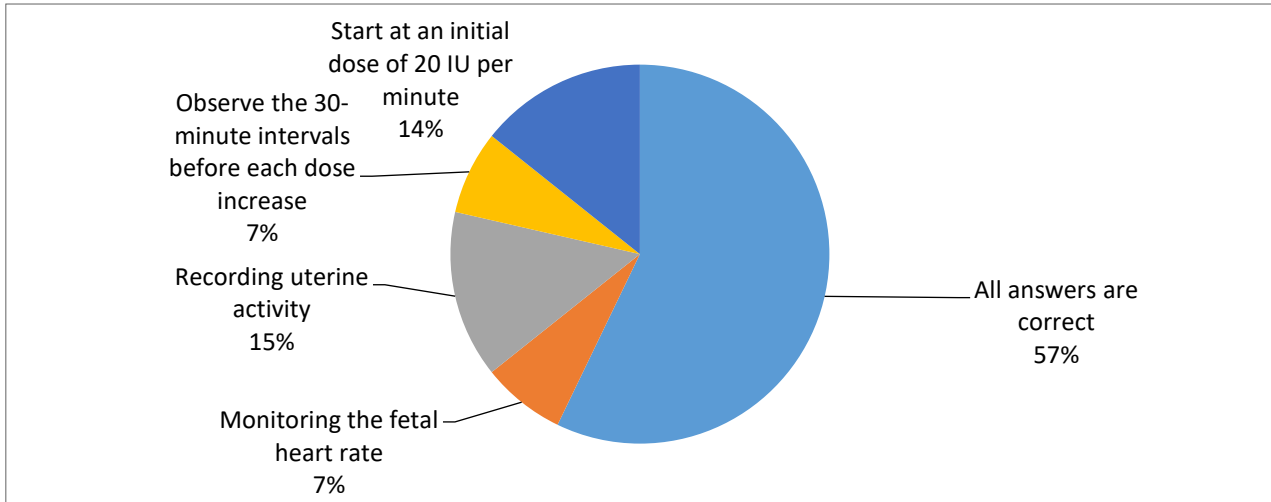


Figure 4.2 Conduct during oxytocin administration

After analyzing the results in in Figure 12 above, we note that the majority of midwives are familiar with the procedure for administering oxytocin during spontaneous labour, which consists of monitoring the fetal heart rate, recording uterine activity, respecting the 30-minute intervals before each dose increase, starting with an initial dose of 20 IU per minute.

Table 4.4. Procedure in case of cervical change

Variable Question	Behaviour in case of cervical modification (n=14)				
	Stop the oxytocin infusion immediately	Reducing the dosage in stages	Gradually stop the oxytocin infusion	Stop increasing oxytocin dosage	Breaking the water bag
What do you do in case of cervical changes and/or 5 uterine contractions per 10 minutes	8 (57,15%)	2 (14,28%)	2(14,28%)	1 (7,14%)	1 (7,14%)

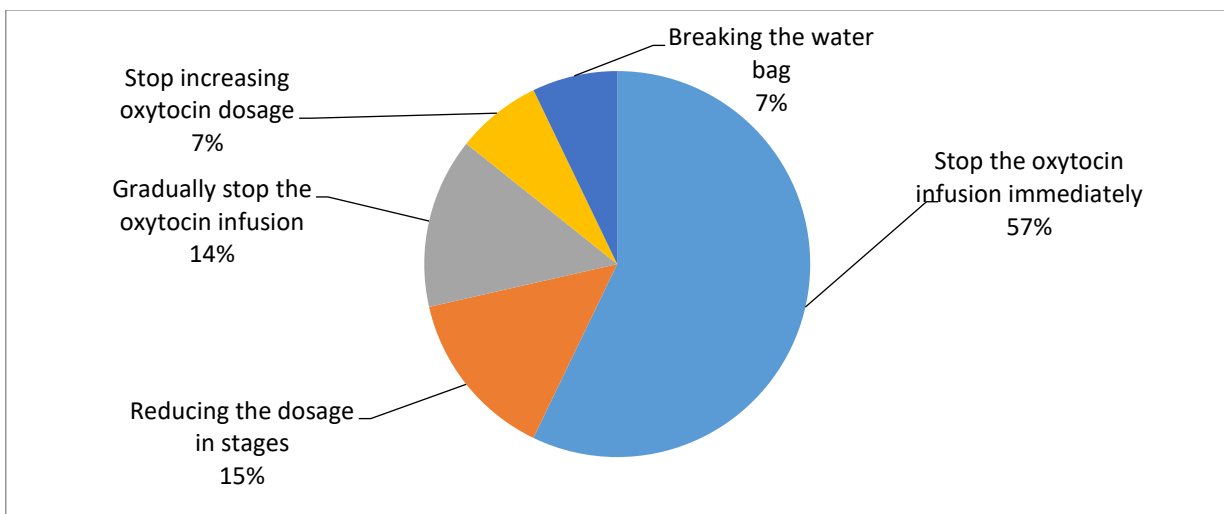


Figure 4.3 Procedure in case of cervical changes

Analysis of the results in in Figure 13 indicates that the majority of midwives do not know what to do in case of cervical changes and/or 5 uterine contractions per 10 minutes (92.86%), which consists of stopping the increase in oxytocin dosage (7.14%).

Table n°4.5 Procedure in case of uterine hyperactivity

Variable Question	Behaviour in case of hyperactive uterus (n=14)		
	Stop the oxytocin infusion	Reduce the speed of the infusion	All answers are correct
What should be done in case of uterine hyperactivity during oxytocin administration?	9 (64,26%)	4(28,57%)	1 (7,14%)

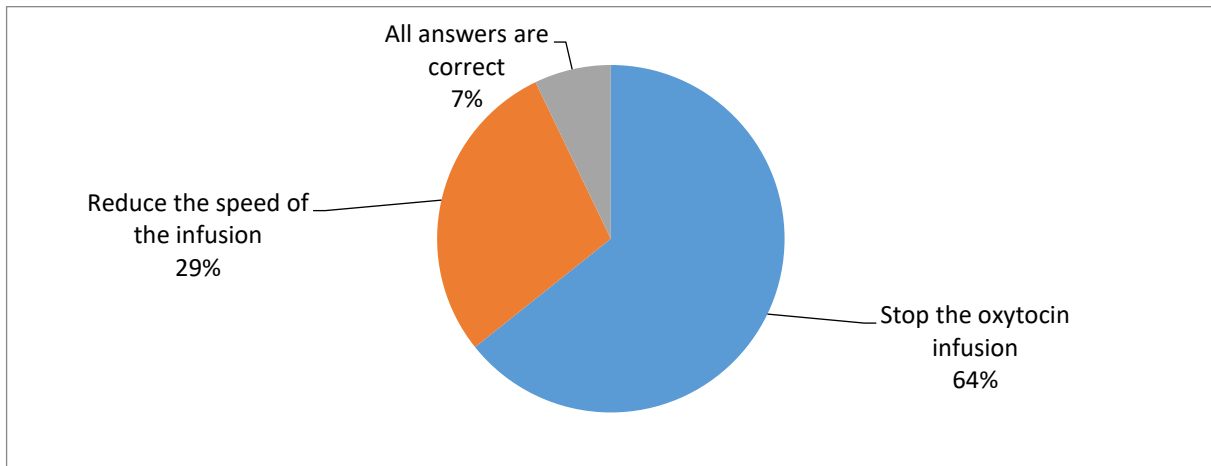


Figure 4.4 What to do in case of cervical hyperactivity

Looking at the results in Figure 14 above, we note that the majority of midwives mastered the procedure to follow in case of uterine hyperactivity which consists in stopping the oxytocin infusion (64.26%).

Table 4.6 Consent of the parturient

Variable Question	Parturient consent (n=14)		
	Yes	No	No position
Do you seek the patient's consent to administer oxytocin during spontaneous labour?	9 (64,29%)	4 (28,57%)	1 (7,14%)

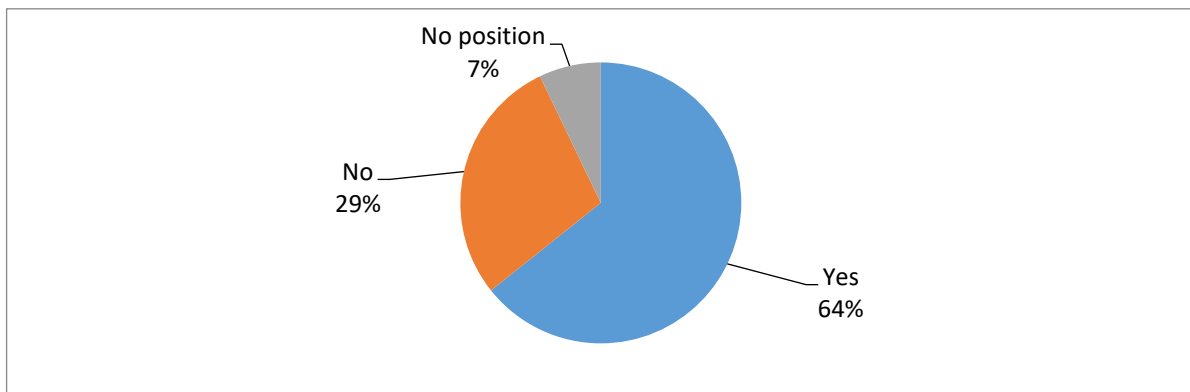


Figure 4.5 Consent of the parturient

After analyzing the results in Figure 15 above, we note that the majority of midwives asked for the consent of the parturient for the administration of oxytocin during spontaneous labour (64.29%) against 28.57% who stated that they did not do so because it was not necessary.

Table 4.7 Existence of protocol for oxytocin use in the maternity hospital

Variable Question	Existence of oxytocin protocol (n=14)	
	Oui	Non
Is there a protocol for using oxytocin in your maternity ward?	6 (42,86%)	8 (57,14%)

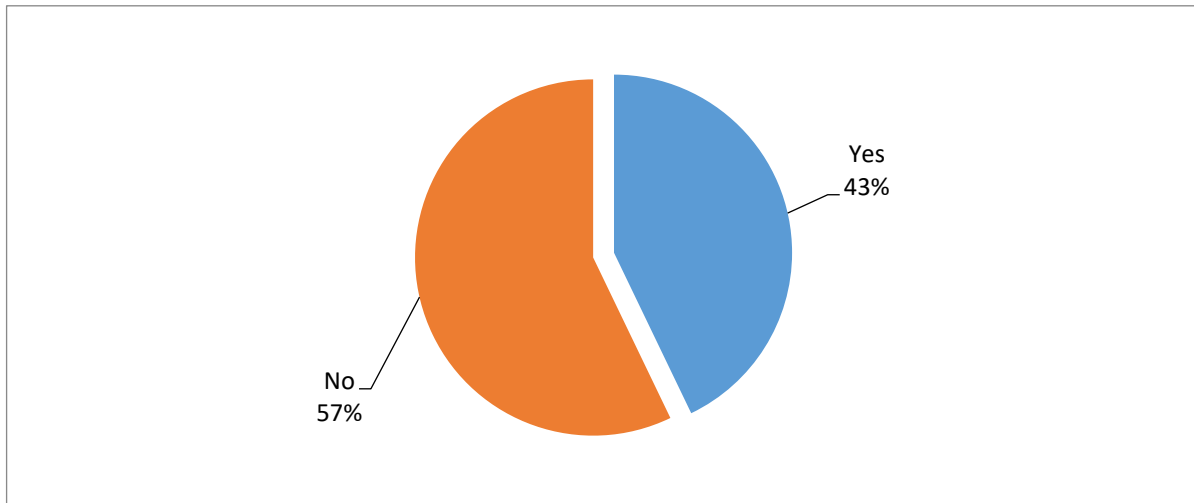


Figure 4.6 Existence of oxytocin protocol

Analysis of the results in Figure 16 above indicates that the majority of midwives do not have a protocol for the use of oxytocin in their maternity unit (57.14%) compared to 42.86% who confirmed the existence of such a protocol.

Table 4.8 Recording the indication for oxytocin administration in the obstetrical record

Variable Question	Recording the indication for oxytocin administration in the obstetrical record (n=14)		
	Yes	No	No answer
Do you record the indication for oxytocin administration in the obstetric record?	2 (14,29%)	11 (78,57%)	1 (7,14%)

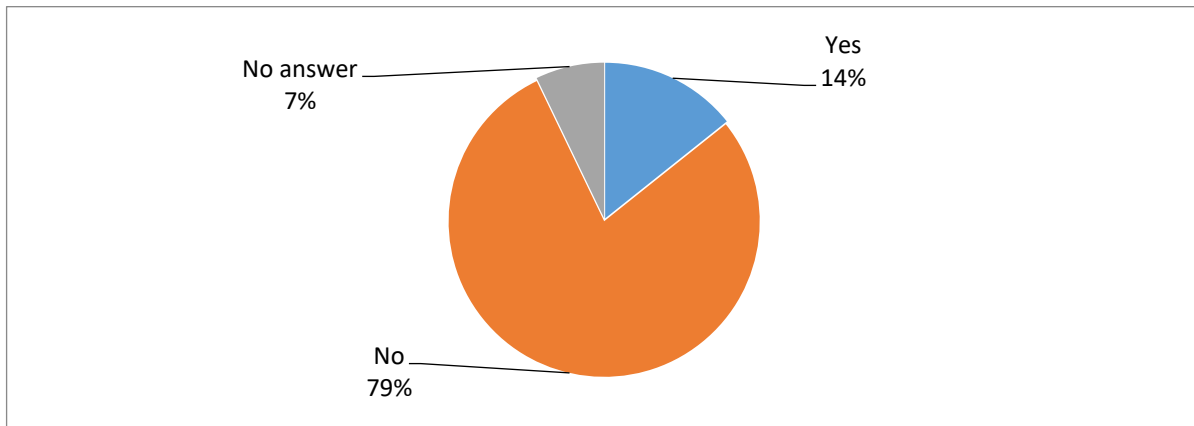


Figure 4.7 Recording the indication for oxytocin administration in the obstetric record

The results in Figure 17 above show that the majority of midwives do not record the indication for oxytocin administration in the obstetrical record (78.57%) compared to 14.29% who do.

Table 4.9 How to learn the oxytocin infusion technique

Variable	Means of learning the technique (n=14)		
	Service colleagues	Initial or basic training	Imitation
Question			
How did you learn the oxytocin infusion technique?	5 (35,71%)	7 (50,28%)	2(14,28%)

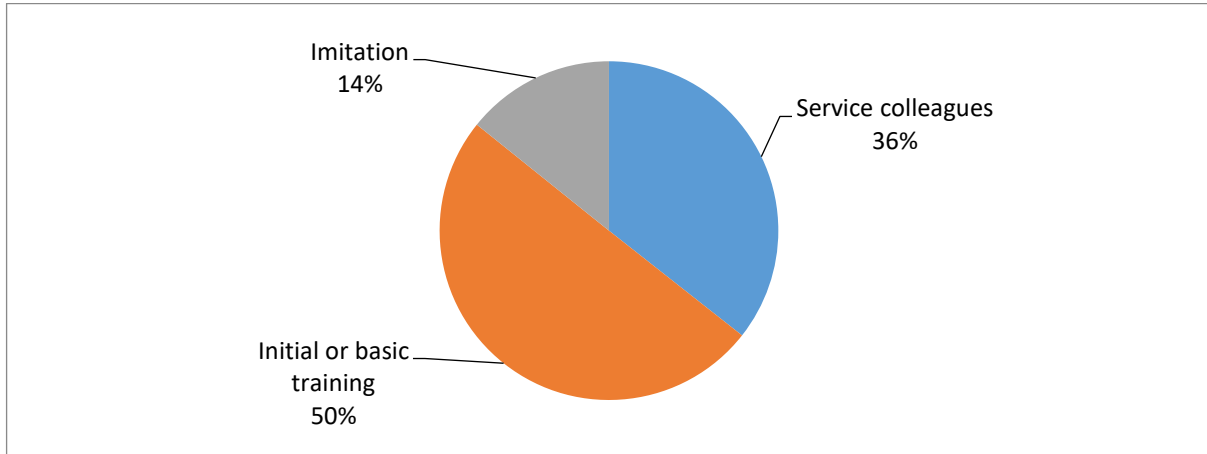


Figure 4.8 How to learn the oxytocin infusion technique

From the results in the table above, we see that 50.28% of midwives learned the technique of using oxytocin from their initial or basic training (50.28%) against (35.71%) who learned it from their colleagues and 14.28% by imitation.

Table 4.10 Existence of appropriate equipment for oxytocin administration

Variable	Existence of appropriate equipment for oxytocin administration (n=14)	
	Yes	No
Question		
Do you have appropriate equipment for oxytocin administration?	6 (42,86%)	8 (57,14%)

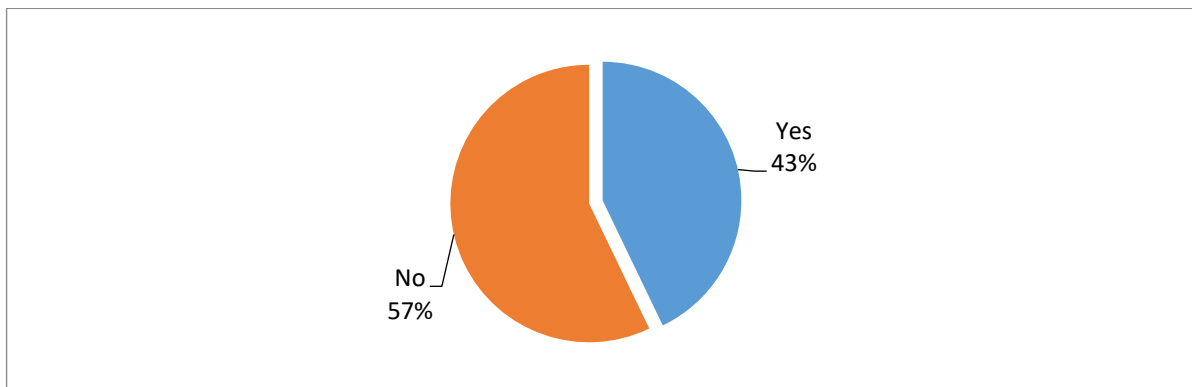


Figure 4.9 Availability of appropriate equipment for oxytocin administration

After analyzing the results in Figure 19 above, we note that the majority of midwives reported not having appropriate equipment for oxytocin administration (57.14%) compared to 42.86% who reported having equipment.

Table 4.11 Type of equipment reported by midwives

Variable Question	Type of equipment for administration of oxytocin use (n=14)	
	Clock	None
What type of equipment do you have?	6 (42,14%)	8 (57,14%)

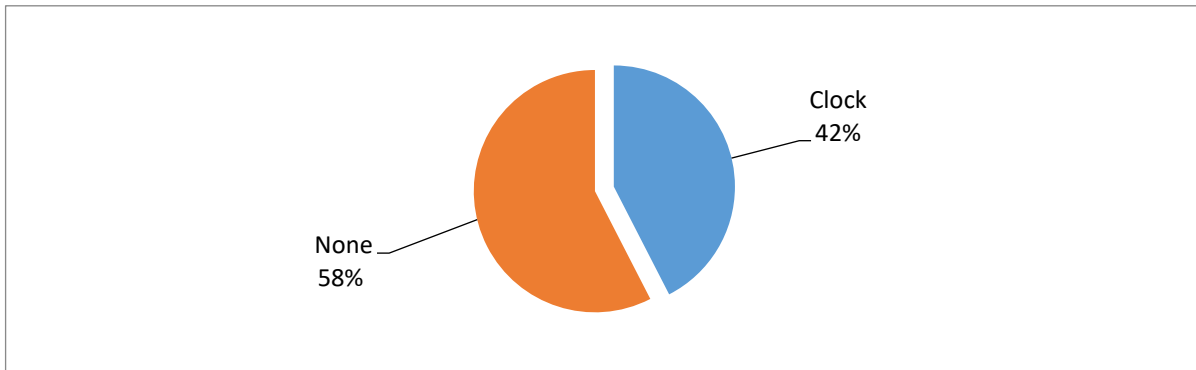


Figure 4.10 Type of equipment reported by midwives

Concerning the type of equipment, 6 subjects (42.86%) declared having only the clock as equipment against 8 subjects (57.14%) who acknowledged having no equipment for oxytocin administration.

5. Discussion

Regarding the question of how to prepare oxytocin during spontaneous labor, the results of the study showed that the vast majority of midwives mastered the preparation of oxytocin during spontaneous labor (85.71%).

Julie Saily (2020), in Port Royal, found that the protocol was respected for the indication, the preparation and the duration of the increments.

These results show that the training not only improved the theoretical knowledge of the midwives but also had other beneficial effects such as the usual practices of preparation of oxytocin during spontaneous labor.

Regarding the conduct of oxytocin administration during spontaneous labor, the study showed that the majority of midwives were well versed in the conduct of oxytocin administration during spontaneous labor, which consists of monitoring fetal heart rate, recording uterine activity, respecting the 30-minute intervals before each dose increase, and starting at an initial dose of 20 IU per minute

Julie Saily (2020), had made the same observation in Port Royal after the implementation of the protocol on the use of oxytocin.

However, when asked what to do in the event of cervical changes and/or 5 uterine contractions per 10 minutes, the results of the study indicated that the vast majority of midwives did not know what to do (92.86%), which was to stop the increase in oxytocin dosage. For some, the oxytocin infusion should be stopped immediately (57.15%) and for others, the dosage should be reduced in stages and/or the oxytocin infusion should be stopped gradually (28.52%). These results are contrary to the recommendations of Duminil and Tazi (2017), Dupont *et al* (2017) in France and those of National College of Midwives of France (2018) to stop the increase in oxytocin dosage in case of cervical changes and/or 5 uterine contractions per 10 minutes.

Regarding the recording of the indication for oxytocin administration in the obstetrical record, the results showed that the majority of midwives did not record the indication for oxytocin administration in the obstetrical record (78.57%).

Coulm and Tessier (2017), recommend that oxytocin can only be administered in a hospital setting and requires monitoring under a service protocol. The indication and the modalities of administration must be traced and the rate used indicated in m U/min.

Duminil and Tazi (2017) recommend in their protocol for the use of oxytocin in the birth room that the indication, information, and consent of the patient must be recorded in the obstetrical record.

This vicious behavior of the midwives would be linked to the fear of being sanctioned by the hierarchy, which prohibits the administration of oxytocin during spontaneous labor in the basic maternity units.

In relation to patient consent for oxytocin administration, the results of the study indicated that the majority of midwives sought consent from the parturient for oxytocin administration during spontaneous labor (64.29%) compared to 28.57% who reported not doing so as they felt it was not necessary. To be informed about her rights, and to give consent on the care that concerns her is one of 7 rights recognized to pregnant women in respectful maternity care (WHO, 2018).

According to CIANE (2012), reports that more than one-third of women were not informed that they had been administered oxytocin during labor.

As for the existence of the protocol for the use of oxytocin in the maternity hospital, the results of the study showed that the majority of midwives did not have a protocol for the use of oxytocin in their maternity hospital (57.14%). This is not in line with the recommendation of National College of Midwives of France (2018) and Dupont *et al* (2017), who recommend establishing within each maternity hospital a service protocol formalizing the following principles:

- Intravenous administration using a medical device allowing control of the dose administered and equipped with an anti-reflux valve;
- Standardization of dilution and flow rates expressed in mIU/min;
- Information to the patient recorded in the medical record

With regard to the conduct to adopt in case of uterine hyperactivity during oxytocin administration, the study revealed that the majority of midwives mastered the conduct to adopt in case of uterine hyperactivity which consists in stopping uterine stimulation, i.e. stopping the oxytocin infusion (64.26%).

Duminil and Tazi (2017), in France, in their protocol for oxytocin use in the delivery room, recommend stopping uterine stimulation, i.e. stopping oxytocin as the course of action in case of uterine hyperactivity.

Regarding the means of learning the oxytocin infusion technique, the results of the study indicated that 50.28% of the midwives had learned the oxytocin infusion technique during their basic training (50.28%), a significant proportion (35.71%) had learned it through colleagues and 14.28% by imitation. These results are in line with Bandura's (1986) social cognitive theory, which is based on the notion of interaction. In this conception, the influence of the environment on behaviour remains essential, but conversely, an important place is given to cognitive factors, which can influence both behaviour and the perception of the environment.

As for the question of whether there was appropriate equipment for oxytocin administration, the study showed that the majority of midwives reported not having appropriate equipment for oxytocin administration (57.14%).

These results are contrary to the recommendations, from National College of Midwives of France in collaboration with National College of Gynecologist-Obstetricians of France and those of Duminil and Tazi (2017), which recommend the use of reglette, iconography, and tocometry for oxytocin administration in the birth room.

The ruler (an electric infusion pump with an anti-reflux valve) is a practical tool that allows immediate conversion between injected ml and micro units/min. It aims to avoid overdosing. While the iconography summarizes the new definitions of the different stages of labor and materializes at a glance the criteria for the use of oxytocin in each of these phases.

Tocometry, on the other hand, is a tool that allows continuous monitoring of uterine contractions and fetal heart rate.

Regarding the type of equipment reported by midwives to administer oxytocin, the majority of midwives reported having only the clock as equipment (57.14%) compared to 42.86% who have no equipment for oxytocin administration.

To better contribute to improving the quality of intrapartum care, midwives must be able to work in a supportive environment. This supportive environment goes beyond getting the necessary medications and medical supplies at the right time and place (i.e., in the labor room). Midwives also need adequate equipment.

Conclusion

The administration of oxytocin during spontaneous labor is a common practice in maternity hospitals in Kindu, but its practice by midwives in Maniema province in general and in the city of Kindu in particular is still problematic.

Through this study, we found that midwives in the basic maternity hospitals of Kindu were performing acts contrary to the recommended scientific standards for the use of oxytocin during spontaneous labor. The vast majority of them (92.86%) did not know what to do in case of cervical changes and/or 5 uterine contractions per 10 minutes; did not record the indication for oxytocin administration in the obstetrical record (78.57%); did not have a protocol for oxytocin use in their maternity wards (57.14%) and did not have appropriate equipment for oxytocin administration.

Thus, we recommend that the health authorities strengthen the capacities of all midwives regarding the use of oxytocin during spontaneous labor with regular follow-up; provide maternity hospitals with appropriate equipment for the administration of oxytocin during labor and delivery; and make the protocol for the use of oxytocin available in all maternity hospitals.

Midwives to record the indication for oxytocin administration in the obstetrical record;

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Competing interests

The authors declare that they have no ties of interest.

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