



College of Medicine and Health Sciences

Department of Anesthesiology, Emergency Medicine and Critical Care

**Thesis: KNOWLEDGE, ATTITUDE AND PRACTICE OF LABOR ANALGESIA
AT TWO TERTIARY LEVEL HOSPITALS IN RWANDA:**

Case study of Rwanda Military Hospital (RMH) and Kigali University Teaching Hospital
(CHUK)

Presented for the partial fulfillment of Masters in Medicine (MMed) in Anesthesiology

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Abstract

KNOWLEDGE, ATTITUDE AND PRACTICE OF LABOR ANALGESIA AT TWO TERTIARY LEVEL HOSPITALS IN RWANDA

Background

Despite availability of methods to manage labor pain, there is a big disparity in labor analgesia knowledge and access between low and high-income countries. Laboring women have significant pain. Healthcare workers can underestimate intensity and severity of the patient experience. A survey was carried out to assess patient knowledge about labor analgesia and current attitudes and practices about labor analgesia in 2 referral hospitals.

Methods

- We recruited all patients undergoing labor at the Kigali University Teaching Hospital (CHUK), Rwanda Military Hospital (RMH) within a one month period beginning in October 2018 meeting inclusion criteria
- Prospectively 91 postpartum women were surveyed and interviewed during a one month period, October 2018, and 77 healthcare professionals at CHUK and RMH were surveyed.
- Analysis was done using descriptive statistics.

Results

Patients: 91 patients were interviewed: 57 at CHUK and 34 at RMH. Most of the participants have never heard about labor analgesia treatments options. We found that 22(38.6%) at CHUK and 1(2.9%) at RMH have heard about labor analgesia .Only 16(17.6%) had labor analgesia and are all received care at CHUK and no patient at RMH had labor analgesia and 83(91.2%) wish labor pain medicine to be offered to them for their next pregnancy. 51(56.0%) do agree that labor pain medicine should be given to all parturient women, whereas 18(19.8%) disagree.

Healthcare providers: 77 staffs: 32 midwives, 4 anesthesiologists, 5 obstetricians, 17 residents in anesthesia, 19 residents in Obstetrics working at CHUK and RMH .We found that current treatment options for labor pain include non-pharmacological treatment: soothing words by family member or friends 45(58.4%); breathing technique 16(20.7%), meditation/prayer 3(1.7%). There is non-use of pharmacological treatment options for 16(59.3%) at RMH and 2(4.0%) at CHUK respectively. At CHUK, the commonly used pharmacological treatment include the combination of paracetamol and pethidine 32(64.0%), the other combination include pethidine and tramadol 8(16.0%). The other drugs used are pethidine alone 1(2.0%) and Paracetamol 7(14.0%).

Conclusion: There is a wide gap between knowledge, desire for labor analgesia and its provision and significant effort should be put in place for education of staff and patients about labor analgesia.

Acronyms & Abbreviations

- **ACOG:** American College of Obstetricians and Gynecologists.
- **ASA :**American Society of Anesthesiologists
- **CHUK :** Centre Hospitalier Universitaire de Kigali
- **IRB:** Institutional Review Board
- **RMH:** Rwanda Military Hospital
- **SD :** Standard Deviation

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Chapter 1. Introduction

Childbirth is frequently one of the most intensely painful experiences that the majority of women will endure during their lives. Despite availability of many methods of labor pain management, most women still go through painful labor due to lack of knowledge regarding labor analgesia particularly in developing countries. There also exists significant disparity in labor analgesia knowledge and access between low and high-income countries.

Addressing the issue of pain relief during child birth is a way of promoting a satisfactory birth experience and healthy reproductive outcome in women during child bearing. The knowledge, satisfaction, and expectations about labor analgesia among women in Rwanda and other low-income countries have been poorly described. Furthermore, the current practices in regards to labor analgesia are unknown.

Our study aims to evaluate the knowledge, satisfaction, and expectations about labor analgesia among women giving birth in 2 referral hospitals in Rwanda. Furthermore, the current practices in regards to labor analgesia will be described. The information gained will guide planning and development of labor analgesia programs in referral hospitals in Rwanda.

Chapter 2. Literature review

Labor pain usually should be treated. The American College of Obstetricians and Gynecologists (ACOG) and the American Society of Anesthesiologists (ASA) state: “There is no other circumstance where it is considered acceptable for an individual to experience untreated severe pain, amenable to safe intervention, while under a physician’s care. In the absence of a medical contraindication, maternal request is a sufficient medical indication for pain relief during labor.”(1)

Parturients lack of knowledge of labor analgesia may play a role in untreated severe pain. In the neighboring country of Uganda, Nabukenya et al. showed that 7% of women had knowledge about labor analgesia and 47% of the time the source of the information was from friends and family. 78.6% of patients thought any doctor could give labor analgesia. (2).

Another study done in Nairobi, Kenya showed that 56% participants had knowledge about labor pain relief methods. Friends, the antenatal clinic and books/leaflets were the major source on information. 90% indicated they would like to have some form of labor pain relief at their next delivery. 18% had been offered some form of pain relief at their last delivery with 82% of those offered having effective pain relief.(3)

Another study demonstrating the unavailability of labor analgesia was conducted in Egypt, where 82.9 % of women never received information about labor analgesia. Furthermore 28.1% of the women who were expecting severe pain during their upcoming delivery preferred cesarean section in case of non-availability of pain relief as compared to 8.1% if pain relief was presumed to be available (4).

A survey among obstetricians in Nigeria, found that 13.3 % provide routine labor analgesia, 29.1% provide labor analgesia sometimes, and 6.6% provide labor analgesia on patients’ requests. The commonest method used was opioids in 41.1%. The common reasons of lower use of labor analgesia were fear of respiratory depression, cost, and late presentation for labor(5)

A study done in Ethiopia showed that only one healthcare provider surveyed used labor analgesia routinely, 21.1% of the respondents used it sometimes and 16.5% used it upon maternal request. Overall, 62.1% used /practiced labor analgesia for laboring mothers and 49.1% said that pharmacological methods are more effective than non-pharmacological methods (6).

A survey done in Egypt showed that 78.2% of Healthcare providers believed in labor pain relief, whereas 36.8% used neither pharmacological nor non-pharmacological methods. There is still a wide gap between the use of pain-relief methods and women's needs due to hospital related barriers(7).

In Egypt, the study done showed that all healthcare providers knew about managing labor pain in general; 48.5% were knowledgeable about only non-pharmacological labor pain management whereas 51.5% were knowledgeable about both non-pharmacologic and pharmacologic methods.

The most common pharmacologic methods of pain control included systemic opioids 51.1%, regional analgesia 48.9%, non-opioid systemic analgesia 40.8% and inhalational 40.3%.The most common reasons for non-utilization was high patient volume (100%) and small number of staff 76%(8).

Narayanappa et al. described analgesia techniques provided for labor in India. The most common techniques are regional and epidural (43.52%) and fentanyl is the most common adjuvant. It's provided mostly by anesthesiologists and most of them don't believe in myths surrounding labor analgesia(9).

In contrast to the labor analgesia practices in developed and developing countries, the survey by Traynor et al. in Canada showed that neuraxial labor analgesia was available 24 hours per day in all stratum one hospitals. (10)

The knowledge, satisfaction, and awareness of labor analgesia among women in Rwanda and other low-income countries have been poorly described. Furthermore, the current practices in regards to labor analgesia are unknown.

Our study aimed to evaluate the knowledge, attitude, expectations and current practices about labor analgesia among women giving birth in 2 referral hospitals in Rwanda. Furthermore, the current practices in regards to labor analgesia will be described.

The information gained will guide the planning and development of labor analgesia programs in referral hospitals in Rwanda

Chapter 3. Problem statement

The knowledge, attitudes, and expectations about labor analgesia among women undergoing labor in Rwanda are unknown. Furthermore, there is no data on the current practice of labor analgesia in Rwanda.

Chapter 4. Objectives

General objective

This study aims to determine the current state of labor analgesia practice in two referral hospitals in Rwanda.

Specific objectives

- To evaluate the patient knowledge, attitudes and expectations about labor analgesia
- To describe the current practices in regards to labor analgesia in 2 referral hospitals in Rwanda

Chapter 5. Methodology

5.1 Study design

This is a descriptive cross-sectional study using a likert questionnaire accompanied by a cover letter and a consent form

5.2 Study site

The survey was carried out at obstetrics and Gynecology department at Kigali University Teaching Hospital (CHUK) and Rwanda Military Hospital (RMH) labor ward.

5.3 Selection of study population

5.3.1. Inclusion criteria

Eligibility criteria include:

For patients

- 1) 18 years of age or older
- 2) Ability to give informed consent
- 3) Every woman waiting discharge after delivery

For healthcare professionals

- 1) Obstetricians, Obstetrics Residents, Anesthesiologists and Anesthesia residents, mid-wives and nurses working in maternity

5.3.2 Exclusion criteria

For patients:

Any patient who had a caesarian section before experiencing labor

For healthcare professionals:

- 1) Healthcare professionals who are part of the research team for this project

5.4 Ethical considerations

5.4.1 Approval

The data collection was started after getting the approval from IRB committee from University of Rwanda, Research ethics committees of CHUK and RMH, attached here in appendices

5.4.2 Potential Risks:

- There are no known or anticipated risks by participating in this research and there was no loss of benefit of any medical care or employment the participants were entitled.
- And the participants were encouraged to only answer those questions that they were comfortable with.

5.4.3 Potential Benefits:

- By participating in the study, there were no benefits. We hope to improve labor analgesia services for patients undergoing labor in 2 referral hospitals.

5.4.4 Confidentiality:

- Although the data from this research project will be published and presented at conferences, the data will be reported in aggregate form, so that it will not be possible to identify individuals. The research data were assigned a unique study number, linked to a Master List. Any research data collected will be identified only by their study number. Moreover, the Consent Forms are stored separately from the research data, so that it will not be possible to associate a name with any given set of responses.
- **Storage of Data:**
 - The data collection sheets are kept by the primary investigator. When the data will be no longer required, the data will be destroyed.

5.5 Study setting and population

Sampling

We recruited all patients undergoing labor at the Kigali University Teaching Hospital (CHUK) and at Rwanda Military Hospital (RMH) within a one month period beginning

in October 2018 meeting inclusion criteria. This is a sample of convenience based on the personnel resources available.

Before discharge, we conducted interviews with patients meeting the inclusion criteria, on their knowledge, attitudes, satisfaction, and expectations about labor analgesia. Also, we recruited healthcare professionals meeting the inclusion criteria for an interview on current practices of labor analgesia.

Sample size

During the study period, all patients fulfilling the inclusion criteria were considered for this study. Based on current number of deliveries per month in referral hospitals, we included 91 women after vaginal delivery per hospital.

For healthcare providers the sample size was calculated using **Krejcie and Morgan** formula (1970) which considers a confidence interval of 95% at 1 degree of freedom (3.841), and a desired margin of error of 5%.

A contingency of 10% was then applied in anticipation of non-respondents.

Sample size calculation of healthcare providers:

$$n = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

Where: n is the required sample size

n = 77 healthcare providers

X^2 : The table value of Chi-square for 1 degree of freedom at the desired confidence level = $1.96 \times 1.96 = 3.8416$

P: the healthcare provider proportion (the response distribution is assumed to be 0.5 since this would provide the maximum sample size)

d: the degree of accuracy or margin of error (the amount of error that can be tolerated) expressed as a proportion (5%) at 95% of confidence level.

N: Total healthcare providers at the 2 Referral Hospitals.

Chapter 6. Analysis

All participants were given questionnaires with questions on knowledge , attitude and current practice termed YES or NO , agree, disagree or neutral with also some questions with short answers.

The analysis was done by descriptive statistics and bivariate analysis using computer software, STATA with Chi- square test and significant p value of less than 0.05.

Chapter 7. Results

Parturient women

A total of 91 participants were given questionnaires; 57(67.6%) from Kigali University Teaching Hospital (CHUK) and 34(32.4 %) from Rwanda Military Hospital (RMH). Table 1 shows the socio-demographic characteristics of participants. Their age ranged from 18-42 years , with a mean age (\pm standard deviation) of 29.6 years(\pm 5.5).

28 (30.7%) of the parturients are unemployed, 24(26.3%) participants were farmers 11(12.1%) and 10(11.0%)participants were in business. The highest level of education of study participants was secondary 35(38.5%), elementary 30(33.0%), university 25(27.5%) and none 1(1.1%) respectively

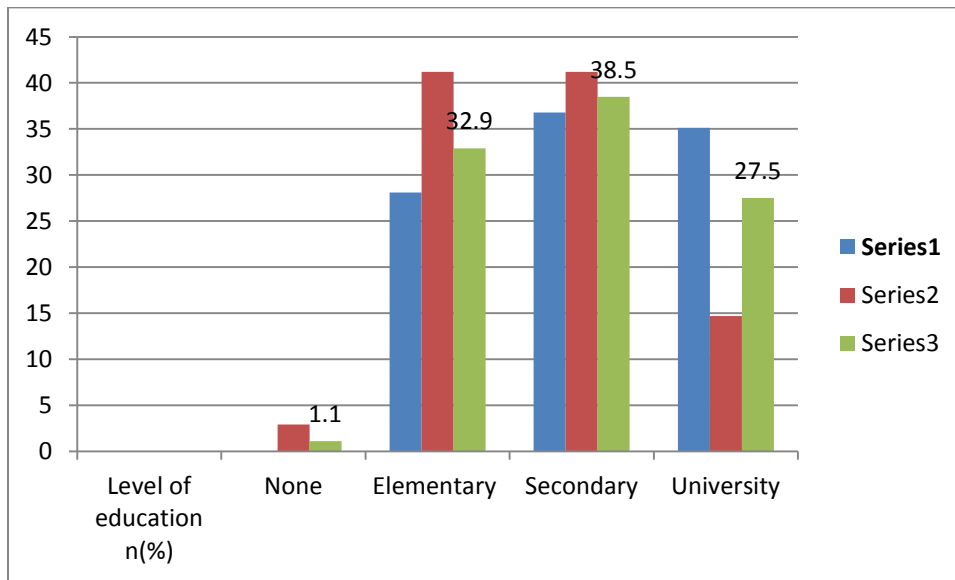
Table 1: Patient demographics

	CHUK	RMH	Total
	n=57	n=34	N=91
Age, mean \pmSD	30.2 \pm 5.6	28.6 \pm 5.2	29.6 \pm 5.5
Number of previous deliveries, median[Q1,Q3]	2[1,3]	2.5[2,3]	2[1,3]
Occupation n(%)			
Unemployed	18(31.6)	10(29.4)	28(30.8)
Farmer	10(17.5)	14(41.2)	24(26.3)
Business	7(12.3)	3(8.8)	10(11.0)
Students	6(10.5)	1(2.9)	7(7.7)
Governmental officers	7(12.3)	2(5.9)	9(9.9)
Non- governmental officers	3(5.3)	2(5.9)	5(5.5)
others	6(10.5)	2(5.9)	8(8.8)
Level of education n(%)			
None	0(0.0)	1(2.9)	1(1.1)
Elementary	16(28.1)	14(41.2)	30(32.9)
Secondary	21(36.8)	14(41.2)	35(38.5)
University	20(35.1)	5(14.7)	25(27.5)

The majority of the participants were primigravida 33(36.3%). For 26(28.6 %), it was the mother's second delivery and the remainder 32(35.1% it was either the 3rd or higher number of delivery.

There was one patient who never went to school and most of the participants had secondary level of education 35(38.5%) followed by elementary 30(32.9%) then university 25(27.5%)

Figure 1 : Level of education of parturients



Series 1: Elementary, Secondary and University at CHUK

Series 2: None, Elementary, Secondary and University at RMH

Series 3: None, Elementary, Secondary and University: Total

Table 2: Labor pain experience

	CHUK n=57	RMH n=34	Total N=91
Duration in labor n(%)			
Less than 6 hours	10(17.5)	8(23.5)	18(19.9)
6-12 hours	10(17.5)	11(32.4)	21(23.0)
12-24 hours	17(29.8)	13(24.2)	30(33.0)
More than 24 hours	18(31.7)	2(5.9)	20(21.9)
Not sure	2(3.5)	0(0.0)	2(2.2)
Pain score out of 10			
Moderate :4-6	6(10.5)	5(14.7)	11(12.1)
Severe :7-10	51(89.5)	29(85.3)	80(87.9)
Median [Q1,Q3]	8[7,8]	8[7,9]	8[7,8]
Did any staff discussed with you about labor analgesia n (%)			
No	22(38.6)	33(97.1)	55(60.4)
Yes	35(61.4)	1(2.9)	36(39.6)
Did you have labor analgesia during your stay?			
No	41(71.9)	34(100)	75(82.4)
Yes	16(28.1)	0(0.00)	16(17.6)

The majority of the women in the study 33.0%, endured labor pain for 12-24 hours; 23.0% for 6-12 hours; 21.9% for more than 24 hours and 19.9 % for less than 6 hours respectively. The pain score was severe 80(88.0%), moderate 11(12.0%) with a mean pain score of 8 with 7 at 25% quartile and 8 at 75% quartile respectively. 55(60.4%) reported that no staff discussed with them about labor analgesia options. At RMH most of the participants 33(97.1%) indicated that no staff informed them about labor analgesia.

Only 16(17.6%) had labor analgesia and were all from CHUK and none of the parturients from RMH had labor analgesia. See **Table 2**.

Table 3: Prior knowledge about labor analgesia

	CHUK	RMH	Total
	n=57	N=34	N=91
Have you heard about labor analgesia n (%)			
Yes	22(38.6)	1(2.9)	23(25.3)
No	35(61.4)	33(97.1)	68(74.7)
Source of information n(%)			
Health Professional	10 (45.6)	0(0.0)	10(43.5)
Internet	4 (18.2)	0(0.0)	4(17.4)
Family or friends	8 (36.2)	1(2.9)	9(39.1)

Most of the participants have never heard about labor analgesia treatments options 68(74.7%) and only 23(38.6%) have heard about labor analgesia: 22(38.6%) at CHUK and 1(2.9%) at RMH respectively.

The major source of information was family members or friends 9(9.9%); from a health professional 6(6.6%); from the internet 4(4.1%); from family or friends plus internet 2(2.2%) and from health professional and internet 1(1.1%).

In the hospital, there was no discussion about labor analgesia prior or during labor 55(60.4%) and it was discussed with 36 parturients (39.6%) mostly at CHUK. This difference may be attributed by the initiation of a training program at CHUK focused on improving labor pain medication delivery.

Table 4: Attitudes /opinions about labor analgesia

	CHUK	RMH	Total
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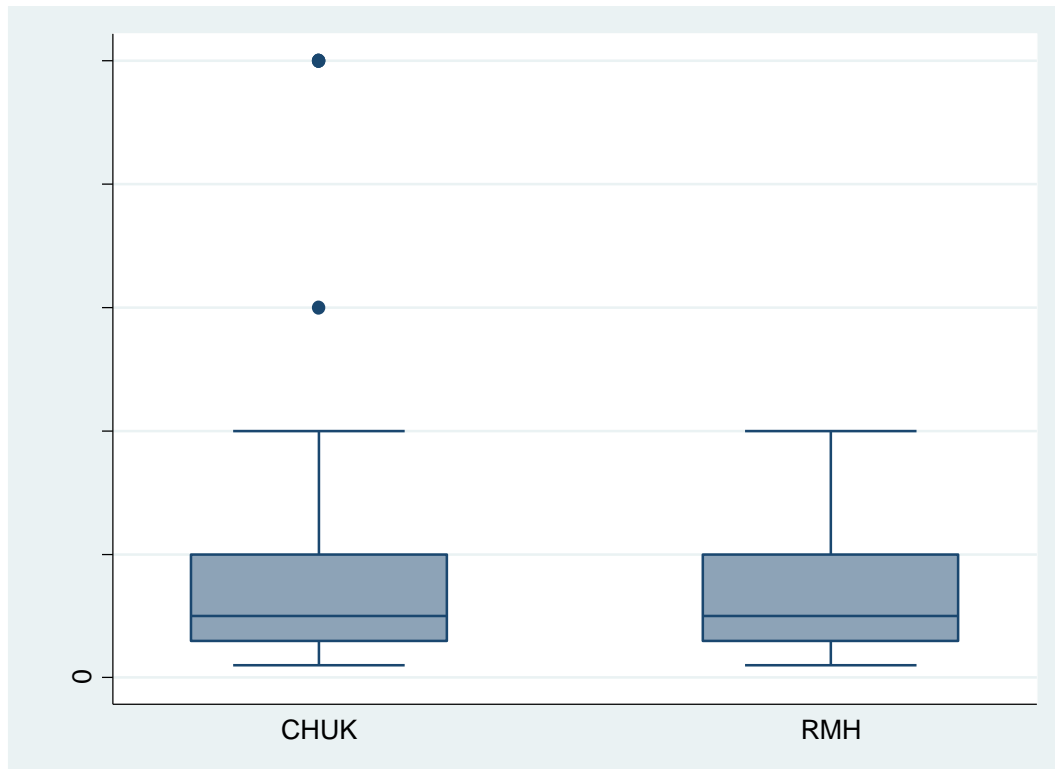
	n=57	n=34	(N=91)
Labor pain drug should be available n (%)			
No answer	1(1.7)	0(0.0)	1(1.1)
No	0(0.0)	3(8.8)	3(3.3)
Yes	56(98.3)	31(91.2)	87(95.6)
Why it should be available n (%)			
It's kind	23(40.3)	12(35.2)	35(38.6)
The pain is too much	20(35.1)	10(2.9)	30(32.9)
It will allow the mother to be comfortable and rest	10(17.5)	4(11.8)	14(15.4)
It's good for the baby	0(0.0)	2(5.9)	2(2.2)
It will allow the mother to concentrate on pushing better	4(7.1)	6(17.7)	10(10.9)
Labor pain should not be given n (%)			
Labor analgesia is unnecessary	0(0.0)	2(5.9)	2(2.2)
Fear of the mother having problems	0(0.0)	1(3.9)	1(1.0)
Have you refused to take labor pain medicine because it will affect your baby?			
Yes	2(3.5)	0(0.0)	2(2.2)
No	55(96.5)	34(100.0)	89(97.8)
In the future labor analgesia should be offered to me n (%)			
Yes	56(98.3)	27(79.4)	83(91.2)
No	1(1.7)	7(20.6)	8(8.8)
Labor analgesia should be offered to all parturient women n (%)			
Agree	27(47.4)	24(70.6)	51(56.0)
Disagree	9(15.8)	9(26.5)	18(19.8)
Neutral	21(36.8)	1(2.9)	22(24.2)
If patient has to pay for labor pain relief , median cost[Q1,Q2]x1000 Rwandan francs	5[3-10]	5[3-10]	5[3-10]

Most of the women in this study wish for the availability of labor analgesia 87(95.6%). Possible explanations for its use include: it is kind 35(38.6%) the pain is too much 30(32.9%); it will allow the mother to be comfortable 36(39.5%) and rest and it will allow the mother to concentrate on pushing better 28(30.8%).

Only 3(3.3%) refused to take medicine because it may affect her or her baby. 3(3.3%) reported that labor analgesia is unnecessary and there is fear of mother having problems whereas a majority of parturients 51(56.0%) state that labor analgesia should be offered to all women.

Most of the parturient women 83(91.2%) wish labor pain medicine to be offered to them for their next pregnancy. 51(56.0%) do agree that labor pain medicine should be given to all parturient women, whereas 18(19.8%) disagree. **Table 4**

The overall payment as suggested by parturient women should be approximately 5000 Rwandan francs. **See figure 2**



Healthcare providers

A total of 77 health professionals were given questionnaires; 32 (41.6 %) midwives; 4(5.2%) anesthesiologists; 5(6.5%) obstetricians; 19(24.7%) residents in obstetrics and

17(22.0%) residents in anesthesia. Table 5 shows the demographic characteristic of participants

Table 5: Demographic characteristics of Healthcare providers

Item	CHUK n=50	RMH n=27	Total N=77
Position n (%)			
Midwives	16(32.0)	16(59.3)	32(41.6)
Anesthesiologists	2(4.0)	2(7.4)	4(5.2)
Obstetricians	3(6.0)	2(7.4)	5(6.5)
Residents in obstetrics	17(34.0)	2(7.4)	19(24.7)
Residents in anesthesia	12(24.0)	5(18.5)	17(22.0)
Duration of practice(years)			
≤5	38(76.0)	20(74.1)	58(75.3)
6-10	12(24.0)	5(18.5)	17(22.0)
11-14	0(0.0)	2(7.4)	2(2.6)
Years, mean±SD			
Country of postgraduate training			
Rwanda	34(68.0)	11(40.7)	45(58.5)
None	16(32.0)	16(59.3)	32(41.5)

The majority of them 58(75.3%) have been in obstetric practice for 5 years or less; 17(22.0%) have been practicing for 6 to 10 years and only 2(2.6%) have been practicing for more than 10 years.

According to the survey, healthcare providers, labor analgesia is sometimes discussed 38(76.0%); 6(22.2%) antenatally at CHUK and RMH respectively. Labor analgesia is never discussed by most of the healthcare providers at RMH 21(77.8%). **See Table 6**

Table 6: Current attitudes towards labor analgesia

	CHUK n=50	RMH n=27	Total N=77	p- value
How often the discussion about labor analgesia is done n (%)				<0.01
Always	2(4.0)	0(0.0)	2(2.6)	
Very often	2(4.0)	0(0.0)	2(2.6)	
Often	7(14.0)	0(0.0)	7(9.1)	
Sometimes	38(76.0)	6(22.2)	44(57.1)	
Never	1(2.0)	21(77.8))	22(28.6)	
How often labor pain control is offered				<0.01
Always	8(16.0)	0(0.0)	8(10.4)	
Very often	1(2.0)	0(0.0)	1(1.3)	
often	4(8.0)	0(0.0)	4(5.2)	
Sometimes	34(68.0)	9(33.4)	43(55.9)	
Never	3(6.0)	18(66.7)	21(27.2)	

Labor analgesia is never offered to parturient women by 18(66.7%) at RMH and 3(6.0%) at CHUK. See table 11. It's offered sometimes by 34(68.0%) at CHUK and 9(33.4%) at RMH.

Current treatment options for labor pain include the following non-pharmacological interventions: Soothing words by family member or friends 45(58.4%); breathing technique 16(20.7%); meditation/prayer 3(1.7%).

16(59.3%) health providers at RMH and 2(4.0%) health providers at CHUK reported not using any of the pharmacologic treatment options listed in the survey. At CHUK the most commonly used pharmacologic treatment is a combination of paracetamol and pethidine 32(64.0%), the other combination is pethidine and tramadol 8(16.0%). The other drugs used are pethidine alone 1(2.0%) and paracetamol 7(14.0%). At RMH the drug

used are paracetamol 6(22.2%); paracetamol plus pethidine 3(11.1%) and hyoscine (Buscopan) 1(3.7%). **See table 7**

No epidural analgesia is used at both referral hospitals.

Table 7: Current treatment options for labor analgesia

Item	CHUK n=50	RMH n=27	Total N=77	p-value
Non pharmacological measures n (%)				0.190
Breathing technique	10(20.0)	6(22.3)	16(20.7)	
Soothing words by family member or friends	31(62.0)	14(51.8)	45(58.4)	
Soothing words by healthcare worker	8(12.0)	4(14.8)	12(12.9)	
Meditation/prayer	1(2.0)	2(7.4)	3(1.7)	
Back massage	0(0.0)	1(3.7)	1(1.3)	
Drugs given to patients for labor pain				<0.01
Hyoscine(Buscopan)	0(0.0)	1(3.7)	1(1.3)	
Paracetamol	7(14.0)	6(22.2)	13(16.8)	
Paracetamol +pethidine	32(64.0)	3(11.1)	35(45.4)	
Pethidine	1(2.0)	1(3.7)	2(2.6)	
Pethidine +tramadol	8(16.0)	0(0.0)	8(10.4)	
None	2(4.0)	16(59.3)	18(23.5)	

The most common barriers preventing the use of labor analgesia practice include: Lack of training and skills in labor analgesia 49(63.6%); lack of internal belief that labor analgesia is necessary 17(22.1%), fear of respiratory depression for the mother 4(5.2%); fear of fetal distress 3(3.9); lack of appropriate monitoring 3(3.9%) and lastly lack of enough staff 1(1.3%). **See table 8**

Table 8 : Barriers preventing set up of labor analgesia service.

Barrier	CHUK n (%)	RMH n (%)	Total	P-value
Fear of fetal distress	1(2.0)	2(7.4)	3(3.9)	<0.01
Fear of respiratory depression for the mother	2(4.0)	2(7.4)	4(5.2)	
Lack of appropriate monitoring	1(2.0)	2(7.4)	3(3.9)	
Lack of enough staff	1(2.0)	0(0.0)	1(1.3)	
Lack of internal belief that labor analgesia is necessary	8(16.0)	9(33.4)	17(22.1)	
Lack of training and skills in labor analgesia	37(74.0)	12(44.4)	49(63.6)	

Chap 8. Discussion

Most of our parturients were young and either unemployed, farmers or worked in a small business. Our study found also that very few mothers knew about labor analgesia, especially women delivering at Rwanda Military Hospital. Despite their lack of prior knowledge, the majority want to have labor analgesia for their next pregnancy. Many of

the parturients did not receive any labor analgesia during their stay. Among those who had knowledge about labor analgesia the commonest source of information was friends or family members. Few got information from health professionals and even fewer from the internet. Many of the parturients' highest level of education was secondary school, followed by elementary, then university and one never went to school. This is quite the same like in Kenya where 89.4%, were not aware of any pain relief method during labour. Among the 10.6% patients that were of a pain relief method, 54% had gotten the knowledge from the doctors. were offered a pain relief method and the intramuscular injectable was offered to all.(11)

Most of patients described labor pain to be severe; therefore it's not surprising that the majority of the mothers in the study believed that labor should be pain-free. Few of them received some pain relief drugs, only from Kigali University teaching Hospital because since March 2018 there was the beginning of training about labor analgesia at CHUK and during data collection time, CHUK was in transition period of improving labor pain medication delivery. This correlate with the study done in Kenya where all the patients had experienced pain in labor with 72% rating the pain as severe pain. (11)

A few mothers refused to take drugs because they felt that it could affect her or her baby. Some also reported that labor analgesia is unnecessary and should not be given to all parturient women. The study done in Zaria, Nigeria showed also some of the women believe that labor analgesia is unnecessary.(12)

From these results, there is a clear indication for labor analgesia for parturient mothers, however, it's not routinely provided. One of the contributing factors is the fact that there is no established labor analgesia service and there is little information from the healthcare providers.

There are some other comparable studies with the example of the study done in Uganda at Mulago Hospital showed that only 7% of the women knew about labor analgesia (2).

This study also showed that there big difference between the two hospitals in regards to labor knowledge and patient expectations about labor pain management.

For healthcare providers this study revealed that a substantial majority do not discuss labor analgesia with patients at both hospitals. This study also reveals a disparity between the patient education and access to care between the referral hospitals in Rwanda.

A discussion about labor analgesia is more likely to occur at Kigali University Teaching Hospital than at Military Hospital, demonstrating a big difference in patient education. More than 50% of healthcare providers never discuss labor analgesia, mostly at RMH.

This difference can be explained by the fact that at CHUK during the data collection period was the beginning an initiative to educate providers about labor analgesia and was in transition period of improving labor pain medication delivery.

Even though some of the participants have at least five years of experience and as such are experienced clinicians yet, only 55.9 % offered labor analgesia to parturient women, which is similar to the findings in Nigeria(5).

Many of the respondents at Rwanda Military Hospital said that labor pain control is never offered whereas many of them at CHUK said that it's sometimes offered which is quite similar to the studies done in Nigeria and Ethiopia. In Nigeria 13.3 % offered labor analgesia routinely, while 29.1% offered it sometimes and 6.6% on patients' requests. In Ethiopia among health professionals, 76.4 % believe that labor analgesia (pharmacologic method) is unnecessary and don't provide it(5) (8).

Labor pain treatment options include non-pharmacological and pharmacological.

The most used in our settings are non-pharmacological options and our study showed that soothing words by family member or friends is the most used; followed by breathing technique, soothing words by healthcare providers, meditation/prayer and back massage respectively. Similarly in Ethiopia the non-pharmacological options are most used and include showing how to bear down was the commonly used by 98.3% professionals ,the psychotherapy by 76.8% and allow companionship by 57.9% respectively.(6)

The most commonly used drugs are paracetamol in combination with pethidine, followed by paracetamol only; pethidine in combination with tramadol and finally Hyoscine alone.

23.5% of respondents reported that nothing was given for treatment of labor pain and there is a big difference between the two hospitals.

A study done in India showed that despite there being different types of labor analgesia available, parenteral injection of opioids (tramadol hydrochloride) or NSAIDs remain the most commonly practiced method. The reasons stated for these were non-dependence on anesthetists (44%), requirement of less monitoring services (67%), less cost (30%) and more effective pain relief (2%). Non-pharmacological means remain the least practiced method.(13)

There is a big difference in terms of labor pain management among the two referral hospitals and our study showed that health professionals at CHUK are the first to manage labor pain comparing to those at RMH with a p value of 0.01(<0.05) correlating the hospital of current practice and treatment options for labor pain management.

No epidural analgesia was offered in all settings which is different from United States where it's available 24 hours a day.(10)

The common barriers preventing labor analgesia included lack of training and skills in labor analgesia for healthcare providers and lack of internal belief that labor analgesia is necessary, the last being very surprising which is similar to the studies done in India.(13),(14)

Chap 9. Conclusion and recommendations

From this study, it's clear that there is a wide gap between knowledge, desire for labor analgesia and its provision. Obstetric healthcare providers have great role to play in edu-

cating the mothers and possibly their colleagues on various methods of labor analgesia before the service can be set up.

Significant number of patients has severe pain during labor and desire to have pain relief. Pain relief is not available to them and many are unaware pain relief exists. Staff also believes that labor pain is severe and relief will benefit the laboring woman. It is imperative that significant effort is placed in education of staff and patients. Many countries have successfully implemented labor pain analgesia to the benefit of mother and baby. Concerns of staff should also be addressed to improve motivation and compliance.

Labor analgesia is a standard of care in obstetrics and so should be provided in the national referral hospitals.

We recommend that the University of Rwanda, the Ministry of Health and health policy makers in Rwanda to develop a national program and protocols on obstetric analgesia for obstetric caregivers. The protocol should be evidence-based and within the limits of available manpower, resources and technology in Rwanda.

We recommend also researchers to carry out other similar studies with inclusion of the district and other referral hospitals in Rwanda.

There is need for team work by all the stakeholders in health sector and the government to achieve this. There is also need of ongoing research and appraisal of the forms and use of obstetric analgesia in the country with a view to ensuring that it is not only readily available, but that ultimately, the standard achieved meets the internationally accepted standards

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11. Appendices

1. University of Rwanda IRB approval

 **UNIVERSITY OF RWANDA** COLLEGE OF MEDICINE AND HEALTH SCIENCES
CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 6th /12/2017

Dr IZABAYO Servant
School Of Medicine And Pharmacy, CMHS, UR

Approval Notice: No 336 /CMHS IRB/2017

Your Project Title "*Labor Analgesia In 3 Referral Hospitals In Rwanda: An Observational Study*" has been evaluated by CMHS Institutional Review Board.

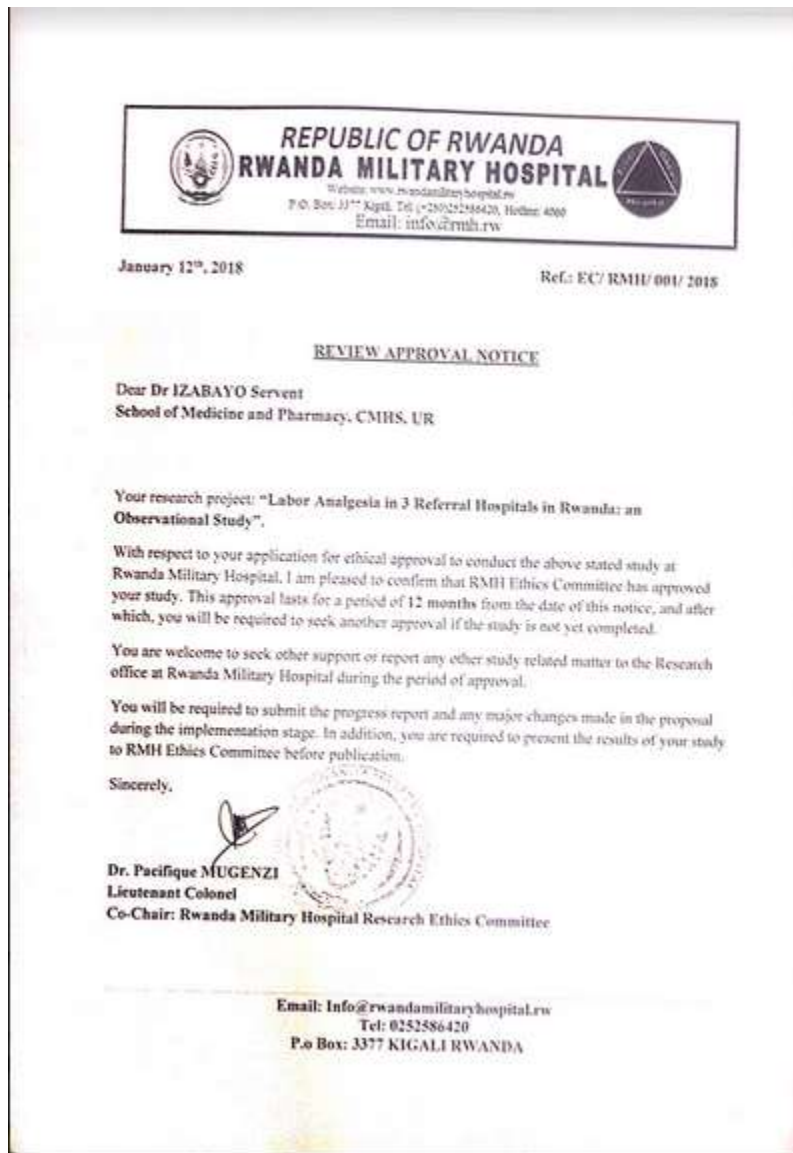
Name of Members	Institute	Involved in the decision		
		Yes	No (Reason)	
			Absent	Withdrawn from the proceeding
Prof Kato J. Njanwa	UR-CMHS		X	
Prof Jean Bosco Gahutu	UR-CMHS	X		
Dr Brenda Astimwe-Kateera	UR-CMHS	X		
Prof Ntanganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayunga N. Egidie	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS	X		
Prof Munyashongore Cyprien	UR-CMHS		X	
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Doanilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyiranzinyeye Laetitia	UR-CMHS	X		
Dr Nheramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudege Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 4th July, **Approval letter has been granted to your study.**

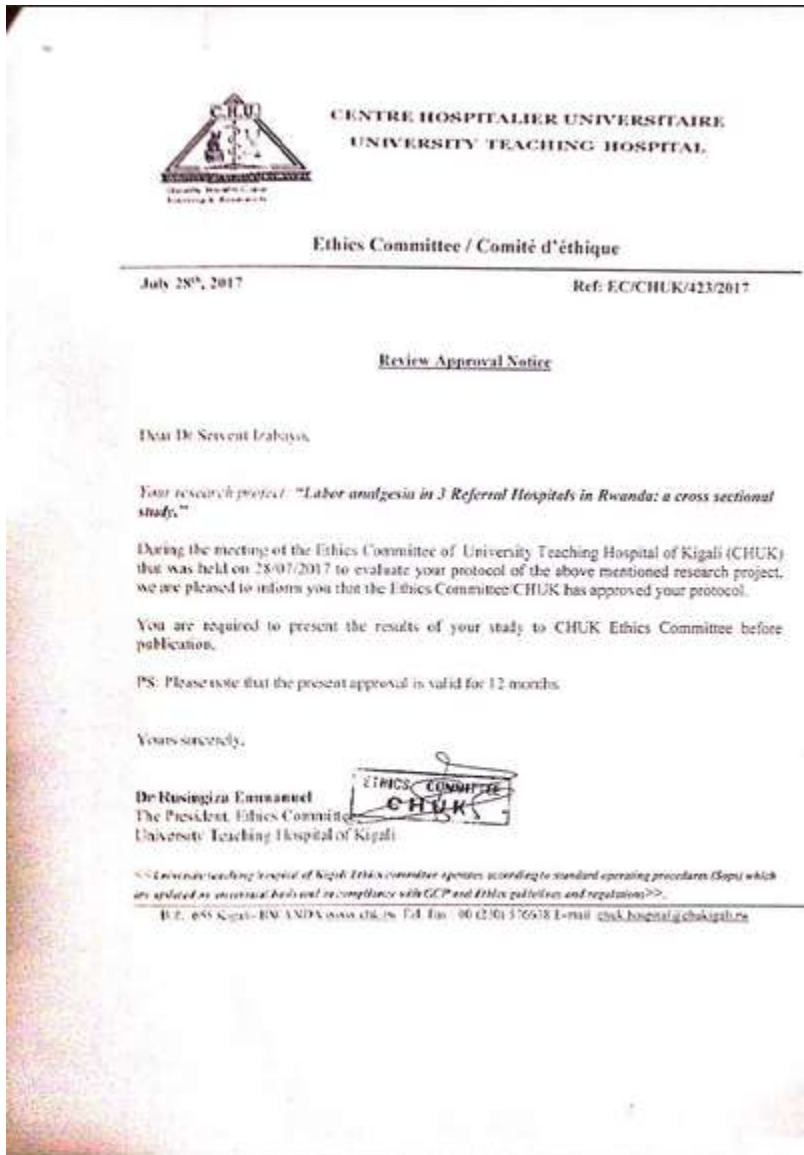
Please note that approval of the protocol and consent form is valid for **12 months**. You are responsible for fulfilling the following requirements:

EMAIL: cmhsirb@ur.ac.rw P.O. Box 3268, Kigali, Rwanda WEBSITE: <http://ur.ac.rw/>

2. IRB RMH



3. IRB CHUK



4. Consent form

Researcher(s):

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University of Rwanda
Email: seriz08@gmail.com
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Email: jill.lanahan@yahoo.com

Prof. Yemi OLUFOLABI , MD
Anesthesiologist
Global Health , Fulbright program
Duke University , USA
Email: oluf001@hotmail.com

Aim(s) and Objective(s) of the Research:

This study aims to determine the current state of labor analgesia practice in 2 Referral Hospitals in Rwanda, including patient knowledge and attitudes and expectations about labor analgesia.

Our Objectives are:

- To describe the current practices in regards to labor analgesia in 2 referral hospitals in Rwanda
- To evaluate the patient knowledge, attitudes and expectations about labor analgesia

Procedures:

- We will record your age, sex, parity, and whether any discussion of analgesia occurred prior to your labor. We will also record the medications you receive for labor analgesia. Before discharge, we will ask you to complete a questionnaire to evaluate your knowledge, satisfaction, and expectation about labor analgesia. We expect this questionnaire to take less than 10 minutes of your time. We hope to enroll 100 patients.
- Please feel free to ask any questions regarding the procedures and goals of the study or your role.

Potential Risks:

- There are no known or anticipated risks to you by participating in this research. You will not lose the benefit of any medical care or employment to which you are entitled.
- You are encouraged to only answer those questions that you are comfortable with.

Potential Benefits:

- By participating in this study, there are no anticipated benefits to you. We hope to improve labor analgesia services for patients undergoing labor in 2 referral hospitals, but this is not guaranteed.

Confidentiality:

- Although the data from this research project will be published and presented at conferences, the data will be reported in aggregate form, so that it will not be possible to identify individuals. Your research data will be assigned a unique study number, linked to a Master List. Any research data collected will be identified only by your study number. Moreover, the Consent Forms will be stored separately from the research data, so that it will not be possible to associate a name with any given set of responses.
- **Storage of Data:**
 - The data collection sheets will be kept by Dr Servent IZABAYO. The master list will be destroyed when the data analysis is complete. When the data are no longer required, the data will be destroyed.

Right to Withdraw:

- Your participation is voluntary and you can answer only those questions that you are comfortable with. You may withdraw from the research project for any reason, until data have been analyzed, without explanation or penalty of any sort.
- Whether you choose to participate or not will have no effect on your medical care or how you will be treated.
- Should you wish to withdraw; data will be deleted from the research project and destroyed, upon your request.
- Your right to withdraw data from the study will apply until data has been pooled with other participants for analysis. After this date, it is possible that some form of research dissemination will have already occurred and it may not be possible to withdraw your data.

Follow up:

To obtain results from the study, please contact Dr Servent IZABAYO on his email: seriz08@gmail.com or phone: 0788894374. **Questions or Concerns:**

- Contact the researcher(s) using the information at the top of page 1;

- This project has been approved on ethical grounds by the Institutional Review Board of the University of Rwanda on (__6th __/12__/2017). Any questions regarding your rights as a participant may be addressed Prof. Kato Njunwa, Chairperson, Institutional Review Board at fsunday@khi.ac.rw or Tel: +250 (0)7885-63312.

Signed Consent

My signature below indicates that I have read and understand the description provided; I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project. A copy of this Consent Form has been given to me for my records

Name of Participant

Signature

Date

Researcher's Signature

Date

A copy of this consent will be left with the research participant, and a copy will be taken by the researcher.

**ICYEMEZO KO UMURWAYI YEMEYE GUKORERWAHUBUSHAKASHATSI
KU BWENDE N'AMABWIRIZA AMUGENEWE**

IZINA RY'UMUSHINGA: Uko ububabare bw'ibise buvurwa mu bitaro 2
bikuru mu Rwanda: Ubushakashatsi ndorezezi.

Muganga Servent IZABAYO

Umuganga wimenyereza gutanga ikinya

Mu ishami ryo gutanga ikinya no kwita ku ndembe

Kaminuza y'u Rwanda

Email: seriz08@gmail.com

Phone: +250788894374

Muganga Jill LANAHAN

Umuganga utanga ikinya

Kaminuza y'u Rwanda

Ishami ryo gutanga ikinya no kwita ku ndembe

Email: jill.lanahan@yahoo.com

Muganga Yemi OLUFOLABI

Umuganga utanga ikinya

Global Health , Fulbright program

Duke University , USA

Email: oluf001@hotmail.com

Impamvu z'ubushakashatsi n'icyo bugamije.

- Icyo ubu bushakashatsi bugamije ni ukureba uko imivurire y'ububabare bw'ibise ihagaze no kugaragaza ubumenyi bw'ababyeyi ku bubabare bw'ibise, uko ababyeyi bishimiye imivurire y'ubwo bubabare bw'ibise, n'uko bifuzwa kuvurwa ubwo bubabare bw'ibise.

- Umushinga ugamije ibi bikurikira:
 - Kwerekana uko imivurire y’ububabare bw’ibise ikorwa muri iki gihe mu bitaro 3 bikuru mu Rwanda.
 - Kwerekana ubumenyi bw’ababyeyi ku bubabare bw’ibise, uko ababyeyi bishimiye imivurire y’ubwo bubabare bw’ibise, n’uko bifuzwa kuvurwa ubwo bubabare bw’ibise.

Imikorere y’umushinga

- Buri murwayi azabazwa imyirondoro ye ijyanye n’imyaka, igitsina, inshuro yabyaye, tuzandika amazina y’imiti uzahabwa ikoreshe mu kukuvura ububabare bw’ibise.
- Mbere yo gusezererwa, gusubiza ibibazo ku ngingo twavuze haruguru. Duteganya ko ibyo bibazo bitazagufata igihe kirenze iminota 10. Twifuza ko twazabaza abarwayi 100.
- Ufite uburenganzira bwose bwo kubaza ibibazo bireba ubukurikirane n’imigambi y’ubu bushakashatsi kimwe n’uruhare uzabugiramo.

Ingaruka Mbi zishobora guturuka kuri ubu bushakashatsi.

- Ntandaruka zizwi cyangwa ziteganywa kuri wowe mukugira uruhare muri ubu bushakashatsi. Ubu bushakashatsi ntibuzatuma utavurwa wari kuvurwa cyangwa ngo butume utakaza akazi kawe.
- Usabwa gusubiza ibibazo ukurikije uko ubyumva kandi mu buryo bukunogeye.

Ingaruka nziza zishobora kubuvaho.

- Nta nyungu bwite uteganyirijwe igihe wiyemeje kugira uruhare muri ubu bushakashatsi. Twizera ko uyu mushinga uzateza imbere imivurire y’ububabare bw’ibise ku babyeyi babyarira mu bitaro 3 bikuru mu Rwanda. Ibyo ariko ntagihamya tubifitiye muri kano kanya.

Kugirirwa ibanga mu byo uzaba wasubije.

- Ibyo tuzabakuraho muri ubu bushakashatsi tuzabigirira ibanga. Ariko inyigisho tuzabikuramo zizatangazwa mu binyamakuru by'ubushakashatsi, no mu nama zabugenewe. Ntawe uzabiheraho kugirango amenye uwo byaturutseho. Ibyo tuzabakuraho muri ubu bushakashatsi bizahabwa nimeru yihariye ijyanye n'urotonde rukuru rw'ibyo tuzakura ku bandi. Ibyo tuzabakuraho byose ushaka kubigeraho azabishobora akoresheje gusa nimeru tuzabiha mugihe dukora ubushakashatsi. Nta na hamwe izina ryawe rizagaragara mu nyandiko zizabuvaho. Ikindi, ibyemezo by'uko mwemeye kuba mu ubushakashatsi bizabikwa n'ahantu hatandukanye n'ahazabikwa ibyo twabakuyeho, ku buryo ntawe uzashobora guhuza izina n'ibisubizo by'ibibazo byatanzwe.

Ibikwa by'ibyo tuzabakuraho.

- Urutonde rukuru ruzabikwa ahatandukanye n'ibizava mu bushakashatsi bibikwe na Dr IZABAYO Servent.
- Ibyo tuzabakuraho muri ubu bushakashatsi igihe bizaba bitagikenewe bizasibwa burundu.

Uburenganzira bwo gusubira ku cyemezo cyawe

- Kugira uruhare muri ubu bushakashatsi biva ku bushake bwawe kandi usubiza ibibazo uko ubyumva mu buryo bukunogeye. Kumpamvu zawe, igihe ibyo tuzagukuraho bitari byasuzumwa, ushobora kwisubiraho ukareka gukomeza kugira uruhare muri uyu mushinga w'ubushakashatsi, utagombye kwisobanura nta n'ingaruka nimwe y'ibihano cyangwa mu mivurirwe yawe.
- Ushobora kwemera cyangwa ukanga kugira uruhare muri uyu mushinga, nta ngaruka bifite kuburyo kwamuganga bagufata ni uko bakuvura.
- Uramutse wisubiye ho, usabwe kubidusaba kugirango ibyo twagukuyeho muri uyu mushinga w'ubushakashatsi bizasibwe kandi bihanagurwe burundu.

- Uburenganzira bwo gukura mu kwiga ibyo twagukuyeho ntibushoboka igihe twatangiye gusuzumira hamwe ibyo twagukuye ho nibyo twakuye ku bandi. Ibyo ni ukubera ko bimwe nabimwe twagukuyeho bizaba byarivangavanze hirya no hino mubushakashatsi kuburyo bitashobora kuvangurwa n'ibyo abandi.

Gukurikirana ubu bushakashatsi:

- Uzifuza kumenya imyanzuro yavuye muri ubu bushakashatsi asabwe kuzabisaba Dr IZABAYO Servent kuri email: seriz08@gmail.com cg phone: 0788894374.
- **Ibibazo no gusobanuzwa**
- Geza ikibazo cyawe kubashakashatsi batanzwe hejuru.
- Uyu mushinga wemejwe ushingiyeye kunshingano mboneza y'inteko ishinzwe amategeko n'igenzura ya kaminuza y'u Rwanda ku itariki ya 06/12/2017 .
- Ikibazo cyose kirebana n'uburenganzira cyangwa uruhare uzagira muri uyu mushinga byashyikirizwa Prof. Kato Njunwa, umukuru w'inteko ishinzwe amategeko n'igenzura bya kaminuza y'u Rwanda, fsunday@khi.ac.rw cyangwa Tel: +25(0)788563312.

Gushyira umukona kubyo wiyemeje.

Gushyira umukono aha hakurikira bivugako nasomye, numvise amabwiriza nahawe, kandi nabonye umwanya wo kubaza ibibazo ngahabwa n'ibisubizo bijyanye n'ubu bushakashatsi. Niyemeje kugira uruhare muri uyu mushinga w'ubushakashatsi kandi mpawe kopi y'inyandiko y'ibyo nyemeje.

Izina ry'uwiyemeje kugira uruhare

Umukono

Tariki

Umukono w'umushakashatsi

4. Survey for Parturient woman

1. Site:
2. Number of survey:
3. Age:
4. Number of deliveries:
5. Occupation:
6. Level of education : None Elementary Secondary
University
7. Country of origin:

Knowledge about labor analgesia

8. Have you heard about labor analgesia before this interview? Yes
No
9. If yes on question 8, how have you heard the information about labor analgesia
a. From internet b. From a health professional c. from the media (radio, television or newspaper) d. from family or friends
e. any other source, specify
10. Medicine for pain during Labor should be available YES NO
11. If YES, pain medicine for should be available because (choose all that applies)
a. It is kind
b. The pain is too much
c. It will allow the mother to be comfortable and rest
d. It is good for the baby
e. It will allow the mother to concentrate on pushing better
12. If NO, pain medicine should not be given because (choose which applies)
a. Labor analgesia is unnecessary
b. Fear of baby having problems

- c. Fear of the mother having problems
- d. Risk of fever/infection to the mother
- e. Increased duration of labor
- f. Fear of needle injection
- g. Increased of cesarean section
- h. Concern about cost
- i. Any other cause, please specify

13. On this scale of 10, please indicate the number that best shows the worst pain you had.

0	1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	---	----

14. Did any staff during antenatal or labor discuss pain with you? Yes No

15. Did you have labor analgesia during your stay? Yes No

16. Have you refused to take pain medicine because it will affect you and/or your baby? Yes No

About labor analgesia in general

17. Labor analgesia should be offered to all woman undergoing labor Disagree
Neutral Agree

18. In the future, I would like to have labor analgesia offered to me Yes No

19. If you had to pay for pain relief, how much do you think you should pay in Rwandan francs?

Thank you for participation in this interview

5. Interview with obstetricians/ Residents in Obstetrics/ midwives/ Anesthesiologists/ Residents in Anesthesia

1. Number of the survey:
2. Position:
3. Number of years in practice:
4. Hospital of current practice:
5. Country of postgraduate training:
6. How often is a discussion about analgesic options prior to labor conducted in your hospital? a) Never b) sometimes c) often d) very often e) always
7. How often is labor pain control offered in your hospital? a) Never b) sometimes c) often d) very often e) always
8. Current labor analgesia options offered to patients in your hospital:

a. Paracetamol

b. Epidural analgesia

c. Intrathecal Opioids (morphine, fentanyl, clonidine.)

d. Intrathecal clonidine

e. Para cervical block

f. Combined supine and epidural analgesia

g. Any other type of labor analgesia, please specify:

.....

9. Barriers preventing labor analgesia practice

a. Lack of internal belief that labor analgesia is necessary

b. Lack of training and skills in labor analgesia

c. Lack of equipment and supplies for labor analgesia

d. Fear of fetal distress

e. Fear of respiratory depression for the mother

- f. Risk of fever/infection in mom
- g. Increased risk of cesarean section (epidural)
- h. Increased duration of labor
- i. Lack of appropriate monitoring
- j. Concern about cost
- k. Lack of enough staff

If yes to sub-question k, give a precision below:

1. Nurses
2. Midwives
3. Obstetricians
4. Residents in Obstetrics
5. Anesthesiologists
6. Residents in Anesthesia

1. Any other barrier, please specify:

.....

10. Setting up a labor analgesia service in your hospital.

At which extent do you agree to the following statements?

a. It is feasible to set up a labor analgesia service in my hospital.

1) disagree 2) neutral 3) agree

b. Labor analgesia service in my hospital is necessary

1) disagree 2) neutral 3) agree

c. The administration will be supportive in setting up a labor analgesia service in my hospital

1) disagree 2) neutral 3) agree

d. Labor analgesia service will be beneficial to patients undergoing labor in my hospital

1) disagree 2) neutral 3) agree

e. Labor analgesia service is a good investment for my hospital

1) disagree 2) neutral 3) agree

f. Epidural should be offered to women in labor

1) disagree 2) neutral 3) agree

g. Pain in labor is unnatural and need to be managed

1) disagree 2) neutral 3) agree

h. I think we can do a better job of pain control

1) disagree 2) neutral 3) agree

11. Who should be in charge for labor analgesia in the hospital?

a. Anesthesiologists

b. Obstetricians

c. Midwives

d. No information

12. What are some non-pharmacological measures to control labor pain used in your hospital?

- 1 Meditation/prayer
- 2 Music
- 3 Discussion with family member or friends
- 4 Discussion with healthcare providers
- 5 Breathing techniques
- 6 Any other, specify:

13. What are some common consequences of labor pain that can motivate you to start labor analgesia service?

1. Increased cardiac output and blood pressure leading to increased risk of complications of cardiac disease and pre-eclampsia
2. Increased risk of uteroplacental constriction leading to fetal distress
3. Long-term emotional stress (bad impact on maternal mental health and family relationships)

Thanks for your participation in this interview