College of Medicine and Health Sciences

School of Medicine and Pharmacy

Department of Anesthesiology, Critical care and Emergency

KNOWLEDGE AND RECEPTIVENESS OF EPIDURAL LABOR ANALGESIA BY PARTURIENTS AT TWO TEACHING HOSPITALS IN A RWANDA

ANALYTICAL CROSS-SECTIONAL STUDY.

Dissertation Submitted in Partial Fulfilment of the Requirements for Award of the Degree of Master of Medicine in Anesthesiology

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DECLARATION

I declare that this dissertation is the result of my own work and has not been submitted for any other degree award at the University of Rwanda or any other institution.

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This dissertation has been submitted for the degree of Master of Medicine in Anesthesiology with my approval as a university supervisor.

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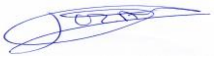
Dr Claudine Uzamukunda		

dissertation has been submitted for the degree of Master of Medicine in Anesthesiology with my approval as a university supervisor.

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DEDICATION

To God the Almighty

To my Parents

To my Lovely wife and Sons

To my sister/brothers and friends

To my classmates and other people who contributed to this study.

I dedicate this work

ABBREVIATIONS

CHUK: Centre Hospitalier Universitaire de Kigali

CHUK: centre hospitalier universitaire de Butare

C-section or C/S: Caesarean section

CMHS: College of Medicine and Health Science

Dr: doctor

LIST OF TABLE

ABSTRACT

Background:

Pain during labor and delivery can be severe and unbearable and differently perceived by parturient. Even with advances in medicine and awareness of labor analgesics, providing epidural for labor analgesia is still challenging due to a variety of factors including cultural pressure to experience normal labor, cost and of side effects. The aim was to evaluate the knowledge and receptiveness of parturient toward epidural for labor analgesia and also factors that affect receptiveness of labor analgesia.

Methods:

The study was analytical cross sectional and source of information was from the pregnant mothers attending antenatal care at university teaching hospital (CHUB and CHUK) during period of study of six months, from January 2022 to June 2022.

Results:

We recruited 388 participants with median age of 31 years. Thirty percent of the participants were aware of the existence of the epidural for labor analgesia and 33.61% of them knew the location of epidural labor analgesia. Fifty-five percent (55.61%) preferred epidural analgesia while 35.2% preferred intravenous labor analgesia.

Women with university level were 6.5 times more likely to be aware of labor analgesia as those who attended at most the primary school (OR=6.52; 95% CI:2.45-17.36; P<0.001)

Previous high pain intensity were 5.4 times more likely to be aware of the existence of labor analgesia as those who did not have pain (OR=5.38; 95% CI: 1.92-15.03; p=0.001).

Primipara was 1.8 more likely to request the labor analgesia during the next labor as those who were multipara (OR= 1.82; 95% CI: 1.05-3.16; p=0.034); participants who expressed severe pain during the previous labor were 4.5 times more likely to have the desire to request the analgesia during the next labor as those who did not have pain (OR=4.52; 95% CI: 2.01-10.18; p<0.001) and participants who were in the Ubudehe third category were less likely to request the analgesia during their next labor as those who were in the first category of Ubudehe (OR=0.19;95%CI:0.40-0.97; p=0.047)

Conclusion:

This study showed that knowledge and receptiveness of epidural labor analgesia was low. More education of parturients using different methods especially for low educational level can result to the improvement.

Keywords:

Knowledge, Receptiveness, epidural for labor analgesia, low-resource

Chap I: INTRODUCTION

1.1 BACKGROUND

Pain during labor can be severe and unbearable [1, 2, 3] and differently perceived by parturient depending on their pain threshold. Historically, in the 15th century, midwives who attempted to provide pain relief during labor were burned [4]. Even with advances in medicine and awareness of labor analgesics including medications and techniques that can relieve pain without compromising the maternal and fetal wellbeing, providing epidural for labor analgesia is still challenging due to a variety of factors. These can include barriers to accessibility such as availability of equipment, consumables, staff with sufficient skills and monitoring tools, or myths and controversies surrounding labor [5].

Across the globe, knowledge and receptiveness toward labor analgesia is low as shown by a study done in India where 90.5% were unaware of labor analgesia. Even after explanation, only 23% considered accepting labor analgesia. The reason for refusal was that there was cultural pressure to experience natural labor [6, 7].

In Africa, a study done in Nigeria in 2003 about attitudes of patients to obstetrical analgesia showed that only 21.1% were aware about labor analgesia [8]. In 2016, another study was conducted on perceptions and practice of epidural for analgesia and revealed that 43.3% of parturient was aware of epidural for analgesia and 95% of those that were aware were ready to use it. The found reasons for poor was the desire to experience normal labor, cost, and fear of side effects [9]. Another study done in South Africa showed that 56.3% knew about pain relief and most of them had received information from previous labor experience (56.5%) or from friends and relatives (55.3%). Of the women who had knowledge about pain relief, 65.9% indicated they were aware of thigh injections presumably using pethidine. Of the women who had undergone labor, 55,7% had experienced severe pain from past labor and 65.3 of these women reported pain experience to be unacceptable [10].

In Rwanda, Izabayo S. et al. conducted a study on labor analgesia in 2018 surveying women who were in postpartum period in 2 referral hospitals (CHUK and RMH). The results showed that

74.7% had never heard about labor analgesia, 25.27% had heard about it from friends or health care, and 87.9% expressed the need to have analgesia during next labor.

There is no data showing pregnant women's knowledge about epidural for labor analgesia and factors that can affect its receptiveness in Rwandan context especially referral hospitals. We conducted this study with the aim to evaluate the knowledge and receptiveness of parturient toward epidural for labor analgesia and factors that affect this receptiveness of epidural for labor analgesia among pregnant mothers attending antenatal care at CHUK and CHUB.

1.2 DEFINITION

a. Knowledge: it is defined as familiarity, awareness, understanding of, or information about a subject that is retained through experience or study.
b. Receptiveness: it is defined as willingness to listen to and accept new ideas and suggestions

1.3 PROBLEM STATEMENT

Labor is an unbelievably difficult and painful time for women. Women with bad experiences can have psychological and physiological effects such as postpartum depression, posttraumatic stress symptoms [11], and physiological changes that can affect both mother and fetus. For that reason, anesthesia providers, especially anesthesiologists, should put effort into reducing labor pain by giving epidural for labor analgesia, which can make natural labor and delivery painless. Data about knowledge and receptiveness of pregnant mothers toward epidural for labor analgesia are needed to achieve painless labor.

I.4 STUDY OBJECTIVE

1.4.1 GENERAL OBJECTIVES

1. To evaluate the level of knowledge and receptiveness of epidural for labor analgesia of pregnant women attending antenatal care at CHUB and CHUK

1.4.2 SPECIFIC OBJECTIVES

1. To evaluate the knowledge about epidural for labor analgesia of pregnant mothers attending antenatal care at CHUB and CHUK

2. To evaluate the receptiveness towards epidural for labor analgesia of pregnant mothers attending antenatal care at CHUB and CHUK

3. To evaluate factors that may predict the receptiveness of epidural for labor analgesia of pregnant mothers attending antenatal care at CHUB and CHUK

1.5 RESEARCH QUESTIONS

1. What is the knowledge and receptiveness of pregnant mothers toward epidural for labor analgesia?

2. What are the factors that could potentially interfere with the receptiveness of epidural for labor analgesia in those two hospitals?

CHAPTER II: LITERATURE REVIEW

2.1 INTRODUCTION

Normal labor causes physiological pain, which is severe to unbearable [1, 2] and can be compared to the pain caused by amputation of finger without [12]. It has been shown that women need labor analgesia, as epidurals are usually requested [1] and are viewed as the most effective and gold standard for labor analgesia [12]. They are used in high income country at an increasing rate in many large hospitals [13].

2.2 Normal labor

Normal labor is defined as regular contractions associated with cervical changes and fetus expulsion. It is composed of 3 stages: the first stage which is further divided into the latent phase from the beginning of contraction/labor up to cervical dilation of 3cm, and the active phase from cervical dilation of 4cm with effacement more than 80% up to dilation of 10cm. The second stage is from full cervical dilation to fetus expulsion. The third stage is from the end of fetus expulsion to the end of placenta expulsion [14].

2.3 PAIN PATHWAYS DURING LABOR

The pain during labor arises from the contraction of uterine muscles, resistance from cervix and perineum, progressive cervical dilation and lower segment of the uterus, and stretching and compression of the structures of pelvis and perineum [3].

The first stage of labor pain is primarily visceral resulting both uterine contractions and cervical dilatation. It initially corresponds to the T11-T12 dermatomes during the latent phase of labor, but involves the T10-L1 dermatomes as labor progresses to the active phase. The afferent visceral fibers which are responsible for labor pain travel along sympathetic nerve fibers, first to the uterine and cervical plexuses, toward the hypogastric and aortic plexuses, before entering the spinal cord with the T10-L1 nerve roots. The pain perception is initially located in the lower abdomen, but as labor progresses, the pain is increasingly felt in the lumbosacral area, gluteal region, and thighs. Perineal pain starts at the end of the first stage, indicating the beginning of fetal descent and the second stage of labor. The fact that the Pudendal nerve (S2–4) gives sensory innervations to the perineum, indicates that the second stage of labor pain involves T10-S4 dermatomes [5, 15].

2.4 LABOR ANALGESIA

Labor analgesia can be categorized as non-pharmacological and pharmacological with pharmacological often being preferred by pregnant mother [1].

2.4.1 NON PHARMACOLOGICAL TECHNICS

Techniques can enhance the psycho-emotional experiences of women during labor. The Lamaze technique is where the parturients takes a deep breath at the beginning of every uterine contraction followed by shallow breathing, massage, acupuncture, yoga, hydrotherapy, aromatherapy, and sterile water injection. The responses to these techniques vary considerably and most parturient require additional analgesia [1, 3,15]

2.4.2 PHARMACOLOGICAL TECHNICS

Parenteral or systemic opioid analgesics and sedatives cross the placenta and can affect the fetus. The commonly used sedatives are meperidine, fentanyl, midazolam, ketamine and promethazine. Morphine is less common and used with caution due to its side effects on the mother and fetus that are worse compared to other opioids. Meperidine is well investigated and commonly used among opioids [3,15]

Neuraxial blocks, which include intrathecal or epidural techniques, alone or combined, are now becoming the most popular methods of analgesia during labor and delivery as they ca provide excellent pain relief in the first and second stage of labor, allowing the mother to be cooperative throughout. They can also be used for cesarean section when indicated. The combination of opioids and local anesthesia give a more satisfactory response than when used alone. The combination also decreases the amount of opioids required, leading to decreased side effects [3,15, 16]. The most common local anesthetic drugs used are bupivacaine, ropivacaine and lidocaine [3].

2.5 BENEFIT OF ANALGESIA

Despite the fact that epidurals are thought to prolong labor and increased use of instrumental delivery, they are associated with good neonatal outcome, satisfactory maternal health, and decreased cesarean section rate compared to parental opioids [13, 15]. Local anesthetic used in low concentration or combined with lipid soluble opioids has no impedance on labor progression or newborn depression [13]. No long term lower back pain due to use of epidural labor analgesia [17]

CHAPTER III: MATERIALS AND METHODS

3.1. STUDY DESIGN

This was cross sectional analytical study design. The source of information was from the pregnant mothers attending antenatal care at university teaching hospitals (CHUB and CHUK) during a during period of six months from January 2022 to June**.**

3.2 STUDY SETTING

The study was conducted in department on Obstetrics and gynecology at University Teaching Hospitals during study period (CHUK & CHUB). Data was collected from pregnant mothers with gestational age of more than 12weeks who were attending prenatal visits (antenatal care) without an indication for elective cesarean sections like previous uterine scar, maternal malformation or not willing to deliver by spontaneous vaginal delivery.

3.3 SAMPLING

3.3.1 STUDY POPULATION

This is a study of the prevalence of knowledge and receptiveness of epidural for labor analgesia involving all pregnant mothers attending antenatal care at a gestational age of more than 12 weeks during the study period at University Teaching Hospitals. The minimal sample size of 384 was obtained by following the Cochrane formula for prevalence (receptiveness) [18].

$$n = \frac{Z^2 P(1-P)}{d^2}$$

N: is the sample size e

Z: is the statistic corresponding to the level of: 95% corresponds to a Z value of 1.96

P: is expected prevalence: 50%

D: is precision (corresponding to effect size) 5%

3.3.2 INCLUSION CRITERIA

- The study included all pregnant women aged 18 years and above, with gestational age above12 weeks attending antenatal care during the study period at university teaching hospitals who voluntarily accepted to participate in the study and signed the informed consent.

3.4 DATA COLLECTION PROCEDURE AND DATA ANALYSIS METHODS

After getting approval from the Research and ethical committee of CHUB and CHUK following a presentation, relevant information was collected from pregnant mothers attending antenatal care. After the signing of a consent form, mothers were instructed on how to fill out the questionnaire during the study period. The collectors who were midwife and anesthesia residents firstly took information about demography and knowledge about epidural for labor analgesia then we explained to the participant about epidural for labor analgesia before collecting data regarding receptiveness.

3.4.1 DATA ANALYSIS

The collected data was entered into Epidata version 3.1 and the exported to Stata version 13 for analysis. Descriptive categorical data were presented using frequencies and percentages in tables and continuous data were summarized using mean and median depending on their distribution which was tested using Shapiro-Wilk test. Logistic regression analysis (Odds ratios and their 95% confidence intervals) were used to study the relationship between predictors and outcomes namely knowledge of epidural labor analgesia and request of analgesia during labor. The different variables were considered to be the predictors of both awareness and requesting labor analgesia during the next labor: age, religion, education level, economic category, occupation, pain during the previous labor and parity where they were run in the binary logistic regression. The variables that shown to have a strong association with the outcome of interest ($p<0.25$) in the binary logistic regression were taken to the multivariable logistic regression and we used the backward selection of predictors during the multivariable logistic regression analysis. Statistical significance for the association was taken at level $p<0.05$.

3.5 ETHICAL CONSIDERATION

Before performing the research, a letter of request to conduct the study was sent to the respective Senior Medical Officer. There was no negative impact on the patients because during the data collection the information was protected confidentially; no patients' names and addresses was appearing on the data collection sheet and whenever we guarantee the anonymity of information delivered and confidentiality respected.

This study was carried out after receiving an approval letter from the Research and Ethic committee of CHUK and CHUB and institutional review board (IRB). The given information was kept confidentially and used for research purposes.

CHAPTER IV: RESULTS

Table 1: Socio-demographic characteristics of study

Characteristics	n	%
Age category		
18-35	316	81.44
36-45	70	18.04
>45	2	0.52
Site of recruitment		
CHUK	192	49.48
CHUB	196	50.52
Residence		
South	204	52.58
Kigali	138	35.57
North	25	6.44
Est	12	3.09
West	9	2.32
Religion		
Catholic	175	45.1
Protestant	156	40.21
Islam	21	5.41
Other	36	9.28
Education level		
No formal education/Primary	73	18.81
Up to ordinary level	101	26.03
Up to advanced level	137	35.31
University	77	19.85
Occupation		
Public servant	85	21.91
Private	183	47.16
Farmer	120	30.93
Economic category (Ubudehe)		
Cat 1	120	5.15
Cat 2	117	30.15
Cat 3&4	251	64.7

We recruited 388 participants where median age was 31 years with a minimum of 19 years and maximum of 47 years. The majority of participants (52.58%) resided in the southern province and 45.1% of the participants were Catholic while 61% attended secondary school and 19.8%

attended university. Sixty-two percent of the participants were living in the third economic category. Details are in table 1.

Table 2: Clinical characteristics of study participants

Characteristics	n	%
Gestational age		
<28weeks	91	23.45
28-33weeks	99	25.52
34-36weeks	67	17.27
37-41weeks	131	33.76
Previous obstetric history		
Spontaneous labor	214	55.15
Induced labor	48	12.37
Miscarriage	25	6.44
Emergency C/S	17	4.38
Elective C/S	6	1.54
Fetal hypoxia	2	0.52
Number of previous deliveries		
0	128	32.99
1 to 2	178	45.88
>2	82	21.13
Intensity of pain on previous delivery		
No pain	6	2.31
Moderate pain	34	13.08
Severe pain	220	84.62
Administration of pain relief during previous delivery		
Yes	9	3.46
No	238	91.54
Don't remember	13	5.00
Labor analgesia on previous normal delivery		
Intravenous	6	66.67
Epidural	2	22.22
Combined	1	11.11

c/s: cesarean section

The median gestation age was 34 weeks of gestation and 66.24% of the participants had preterm pregnancies. Fifty-five percent of the participants had history of spontaneous labor in the past, 12.37% had history of induced labor and 4.44% had history of miscarriage. Thirty-three percent of the participants were primiparous and among the multiparous participants 84.62% had severe pain during delivery of the last pregnancy. Among the participants who experienced pain, only 3.46% received pain relief medication. Details are in table 2.

Table 3: Participants' knowledge and information on labor analgesia

Characteristics	n	%
Awareness of epidural labor analgesia		
Yes	119	30.67
No	269	69.33
Knowledge on the location of epidural labor analgesia (n=119)		
Know	40	33.61
Doesn't know	79	66.39
Correctly identified the site for epidural(n=40)		
Intravenous	8	20.00
Back	32	80.00
Awareness on the contraindications of epidural labor analgesia (n=119)		
Emergency or elective C/S	4	3.36
Bleeding	2	1.68
No consent	1	0.84
Infection on injection site	1	0.84
Unaware	11	93.2
Awareness on benefits of epidural labor analgesia (n=119)		
Painless labor	104	87.39
Good maternofetal outcome	6	5.04
Unaware	9	7.56
Awareness on the disadvantages of epidural labor analgesia (n=119)		
Pain on injection	10	8.40
Chronic pain	3	2.52
Unaware	106	89.08
Source of information (n=119)		
Heard from colleagues	76	63.87
Read it or heard from media	25	21.01
Explained by midwives	11	9.24
Experienced in previous pregnancies	5	4.20

Thirty percent of the participants were aware of the existence of the epidural for labor analgesia and 33.61% of them knew the location of epidural labor analgesia. Painless labor was expressed

as benefit of epidural labor analgesia by 86.67% of the participants and 63.33% of the participants who had knowledge on epidural labor analgesia got it from their colleagues while 20.83% got the information from the media. Details are in table 3.

Table 4: Receptiveness of labor analgesia among study participants

Variable	Frequency	%
Request of labor analgesia during next labor (n=388)		
Yes	196	50.52
No	192	49.48
If yes, preference (n=196)		
Epidural	109	55.61
Intravenous	69	35.2
Yoga	16	8.16
None	2	1.02
If no, reasons of rejection (n=192)		
Expensive	71	36.98
Want to experience normal delivery	81	42.19
Fear the failure of the method	54	28.13
Negative effects on my baby	28	14.58
Reduces the love for my baby	30	15.63
It is against God's will	14	7.29

Fifty percent of the study participants mentioned that they can request labor analgesia during next labor and delivery. Among participants who expressed a need to request labor analgesia 55.61% preferred epidural analgesia while 35.2% preferred intravenous labor analgesia and 8.16% preferred yoga. Expensiveness of labor analgesia was the reason for rejection for 36.98% of the participants who did not wish to request labor analgesia during the next delivery, 42.19% wanted to experience normal delivery, 28.13% expressed fear of the failure of the method, 14.58% feared the negative effects om their babies, 15.63% feared that it can reduce the love for their babies and 7.29% rejected it for the reason that it is against the will of God. More details are in table 4.

Factors associated with knowledge about epidural for labor analgesia

Table 5: Association between knowledge of epidural for labor analgesia

Predictors	knowledge of epidural labor analgesia		OR (95% CI)	P value
	Yes	No		
Age				
18-35	92 (29.11)	224 (70.89%)	Ref	
36-45	27 (38.57%)	43 (61.43%)	1.53 (0.89-2.62)	0.123
Site of recruitment				
CHUK	54 (26.12%)	138 (71.88%)	1.27 (0.82-1.95)	0.282
CHUB	65 (33.16%)	131 (66.84%)	Ref	
Religion				
Catholic	63 (36.00%)	112 (64.00%)	Ref	
Protestant	40 (25.64%)	116 (74.36%)	0.61 (0.38-0.98)	0.043
Islam	8 (38.10%)	13 (61.90%)	1.09 (0.43-2.78)	0.85
Other	8 (22.22%)	28 (77.78%)	0.50 (0.21-1.18)	0.116
Education				
No formal education/Primary	13 (17.81%)	60 (82.19%)	Ref	
Secondary	70 (29.41%)	168 (70.59%)	1.92 (0.99-3.72)	0.053
University	36 (46.75%)	41 (53.25%)	4.05 (1.92-8.56)	<0.001
Occupation				
Public servant	33 (38.82%)	52 (61.18%)	Ref	
Private	57 (31.15%)	126 (68.85%)	0.71 (0.42-1.22)	0.216
Farmer	29 (24.17%)	91 (75.83%)	0.50 (0.27-0.92)	0.025
Economic category (ubudehe)				
Category 1	1 (5.00%)	19 (95.00%)	Ref	
Category 2	28 (23.93%)	89 (76.07%)	5.97 (0.72-46.67)	0.088
Category 3&4	90 (35.86%)	161 (64.14%)	10.62 (1.40-80.6)	0.022
Parity				
Primiparous	32 (32.32%)	67 (67.68%)	Ref	
Multiparous	55 (33.74%)	108 (66.26%)	1.06 (0.62-1.81)	0.813
Pain intensity on previous delivery				
None to moderate pain	5 (13.16%)	33 (86.84%)	Ref	
Severe pain	81 (36.99%)	138 (63.01%)	3.87 (1.45-10.32)	0.007

Ref: Reference category

Protestant participants were 0.61 times more likely to be aware of epidural labor analgesia as those who catholic (OR= 0.61; 95% ci: 0.38-0.98; p=0.043) and there was no statistical significant difference in the awareness of epidural labor analgesia between Islam and catholic participants on being aware of labor analgesia (OR=1.09; 95% CI: 0.43-2.78; p=0.85).

Participants who attended university are 4.05 times more likely to be aware of epidural labor analgesia as those who attended at most primary school (OR=4.05, 95% CI: 1.92-8.56, p<0.001) and those who attended secondary school are 1.92 times more likely to be aware of epidural labor analgesia as those have no formal education or who attended primary school (OR=1.92, 95% CI: 0.99-3.72, p=0.053). Participants who are farmers are less likely to be aware of epidural labor analgesia as those who are public servants (OR=0.50, 95% CI: 0.27-0.92), p=0.025). Participants who are in second economic category are 5.97 times more likely to be aware as those who are in category one (OR=5.97, 95% CI: 0.72-46.67, p=0.088) and participants who are in the third and fourth economic category are 10 times more likely to be aware of epidural labor analgesia as those who are in the first category (OR=10.62; 95% CI: 1.40-80.66; p=0.022). Participants who had severe pain during their last labor are 3.87 times more likely to be aware of epidural labor analgesia as those who did not have pain or who had moderate pain (OR=3.87; 95% CI: 1.45-10.32; p=0.007). Details are in table 5.

Factors associated with requesting analgesia during next labor among study participants

Table 6: Association between requesting analgesia during next labor and its predictors

Predictors	Request of analgesia during labor		OR (95% CI)	P value
	Yes	No		
Age				
18-35	162 (51.27%)	154 (48.73%)	Ref	
36-45	33 (47.14%)	37 (52.86%)	0.85 (0.50-1.42)	0.533
>45	1 (50%)	1 (50%)	-	
Religion				
Catholic	79 (45.14%)	96 (54.86%)	Ref	
Protestant	89 (57.05%)	67 (42.95%)	1.61 (1.04-2.49)	0.031
Islam	12 (57.14%)	9 (42.86%)	1.62 (0.65-4.04)	0.301
Other	16 (44.44%)	20 (55.56%)	0.97 (0.47-2.00)	0.939
Education				
No formal education/Primary	43 (58.90%)	30 (41.10%)	Ref	
Secondary	114 (47.90%)	124 (52.10%)	0.64 (0.37-1.09)	0.101
University	39 (50.65%)	38 (49.35%)	0.72 (0.37-1.36)	0.311
Occupation				
Employees with salary	124 (46.27%)	144 (53.73%)	Ref	
Farmer	72 (60.00%)	48 (40.00%)	1.32 (1.06-1.64)	0.013
Economic category				
Cat 1	15 (75.00%)	6 (30.0%)	3.22 (1.14-9.14)	0.028
Cat 2	60 (51.28%)	57 (48.72%)	1.13 (0.73-1.75)	0.583
Cat 3	121 (48.21%)	130 (51.79%)	Ref	
Parity				
Primiparous	65 (65.66%)	34 (34.34%)	1.80 (1.07-3.01)	0.026
Multiparous	84 (51.53%)	79 (48.47%)	Ref	
Pain intensity on previous delivery				
No to moderate pain	11 (28.95%)	27 (71.05%)	Ref	
Severe pain	134 (61.19%)	85 (38.81%)	3.8 (1.82-8.21)	<0.001
Aware of epidural labor analgesia				
Yes	66 (55.46%)	53 (44.54%0	1.33 (0.86-2.05)	0.195
No	130 (48.33%)	139 (51.67%)	Ref	

Ref: Reference category

Participants who are protestants are 1.61 more likely to request analgesia during next labor as those who were catholic (OR=1.6; 95% CI: 1.04-2.49; p=0.031) and those who are Islamic are 1.62 times more likely to request analgesia during the next labor (OR=162; 95% CI: 0.65-4.04;

p=0.301). Participants in the first economic category are 3.27 more likely to request labor analgesia on their next labor as those in the third economic category (OR=3.27; 95% CI: 1.16-9.29; p=0.026) and participants in the second economic category are 1.14 more likely request labor analgesia on their next labor as those in the third economic category (OR=1.14; 95% CI: 0.74-1.78; p=0.533). Participants who are primiparous are 1.8 more likely to request analgesia during the next labor as those who were multiparous (OR=1.8; 95% CI: 1.07-3.01; p=0.026). Participants who are farmers were more likely to request epidural for labor analgesia during their next labor compared to those who are employees with salary (OR=1.32, 95% CI: 1.06-1.64), p=0.013). Participants who experienced severe pain on the last labor were 3.8 times more likely to request analgesia on their next labor as those who experienced moderate pain or no pain at all (OR=3.8; 95% CI: 1.82-8.21; p<0.001) while participants who were aware before about epidural for labor analgesia were 1.33 more to request epidural for labor analgesia. More details are in table 6.

Independent factors to the receptiveness and knowledge

Table 7: Multivariable analysis of factors associated with knowledge about epidural for labor analgesia

Predictors	AOR	95%CI	P>z
Age			
≤35 years		Ref	
36-45 years	1.38	0.72-2.64	0.325
>45 years			
Religion			
Catholic		Ref	
Protestant	0.49	0.26-0.91	0.025
Islam	1.01	0.27-3.71	0.992
Other	0.50	0.19-1.28	0.148
Education			
Primary		Ref	
Secondary	2.04	0.84-4.88	0.111
University	4.83	1.49-15.60	0.008
Occupation			
Employees with salary		Ref	
Farmers	1.07	0.51-2.25	0.853
Income category			
Cat 1		Ref	
Cat 2	0.69	0.34-1.38	0.29
Cat 3&4			
Pain intensity			
No to moderate pain		Ref	
Severe pain	5.03	1.74-14.50	0.003

AOR: Adjusted Odds Ratio; CI: Confidence Interval

Table 8: Final model of predictors of knowledge of epidural for labor analgesia

Predictor	AOR	95%CI	P value
Educational level			
None/Primary	Ref		
Secondary	2.79	1.36-5.68	0.005
University	6.52	2.45-17.36	<0.001
Pain intensity			
No to moderate pain	**Ref**		
Severe pain	5.38	1.92-15.03	0.001

We found that the true predictors of being aware of labor analgesia education level and pain intensity during the previous labor where participants who expressed severe pain during the previous labor were 5.4 (440% increased odds) to be aware of the existence of labor analgesia as those who did not have pain (OR=5.38; CI: 1.92-15.03; p=0.001); participants who attended university were 6.5 (550% increased odds) to be aware of labor analgesia as those who attended at most the primary school (OR=6.52; 95% CI: 2.45-17.36; p<0.001) and participants who attended secondary school were 2.7 (170% increased odds) to be aware of the labor analgesia as those who attended at most the primary school (OR=2.79; 95% CI: 1.36-5.68; p=0.005). Hosmer-Lemershow test was used for validation and goodness of fit where P value were 0.16. [Table 8].

Table 9: Multivariable analysis of factors associated requesting labor analgesia during next labor among study participants (Model 1).

Predictor	AOR	95% CI	P value
Religion			
Catholic		ref	
Protestant	1.797501	0.97-3.30	0.059
Islam	2.049201	0.52-8.02	0.303
Other	0.6519685	0.28-1.50	0.316
Education			
Primary		ref	
Secondary	1.340925	0.61-2.94	0.466
University	2.806868	0.87-9.02	0.083
Occupation			
Employees with salary		ref	
Farmers	1.504657	0.74-3.05	0.259
Income category			
Cat 1	7.508028	1.26-44.72	0.027
Cat 2	1.273108	0.65-2.47	0.476
Cat 3&4		ref	
Parity			
Primipara	1.542455	0.85-2.76	0.146
Multipara		ref	
Pain intensity			
No to moderate pain		ref	
Severe pain	5.243128	2.18-12.59	<0.001
Awareness of labor analgesia			
Yes	1.143627	0.62-2.08	0.661
No		ref	

Table 10: Final model of predictors of requesting epidural for labor analgesia

Predictor	AOR	95% CI	P value
Parity			
Primipara	1.82	1.05-3.16	0.034
Multipara	Ref		
Pain intensity			
No to moderate pain	Ref		
Severe pain	4.52	2.01-10.18	<0.001
Economic category			
Cat 1	Ref		
Cat 2	0.25	0.04-1.30	0.101
Cat 3	0.19	0.40-0.97	0.047

AOR adjusted odds ratio; CI: confidence interval

In multivariable logistic regression analysis, parity, pain intensity during the previous labor and economic category of the patients were found to be the true predictors of requesting analgesia during the next labor where primipara were 1.8 (80% increased odds) to request the analgesia during the next labor as those who were multipara (OR=1.82; 95% CI: 1.05-3.16; p=0.034); participants who expressed severe pain during the previous labor were 4.5 (350% increased odds) to have the desire to request the analgesia during the next labor as those who did not have pain (OR=4.52; 95% CI: 2.01-10.18; p<0.001) and participants who were in the Ubudehe third category were less likely (81% decreased odds) to request the analgesia during their next labor as those who were in the first category of Ubudehe (OR=0.19; 95% CI: 0.40-0.97; p=0.047). Hosmer-Lemershow test were used for validation and goodness of fit where P value were 0.13. [Table 10].

DISCUSSION

In our study, the knowledge about labour analgesia was low as 30.67% of studied population compare to the result from another research which showed that 47% antenatal patients reported have been exposed to the concept of epidural for labor analgesia [19]. These findings are comparable to the study which found that 34.5% of participants had information about labor analgesia [10]. Epidural labor analgesia being new procedure in our country with lower education level of women attending antenatal care can explain low knowledge as most source of information was found to be from colleagues and those who has low level of education has limited level of understanding especially from none health professional about epidural for labor analgesia.

The desire of epidural for labor analgesia was 50.52% which still low compare to this research done in Norway which showed that 65.9% of pregnant women will request labor analgesia for their next deliveries [20]. High number to request labor analgesia is also found in the other study done in Cameroon where 60.71% participants expressed willingness to accept epidural for labor analgesia in future labor [21]

Labor analgesia rejection was mostly associated by need to experience normal delivery at 42.19 % which is high compare to other study done which found that 34.1% of women refused labor analgesia for their next deliveries and the commonest reasons were that it was against the will of God (35%) or they wanted to experience natural child birth (27%) [20], [22]. Literature generally shows the pattern that African women have one of the lowest rates of usage of pharmacological pain relief methods during labor. Some women believe that crying from the pain is a sign of weakness [23] and therefore seeking pharmacological relief would be showing that weakness This is due to cultural pressure to experience normal labor and cost and also poor knowledge.

Most source of information was from their colleagues at 63.87%. Comparable findings are found in study done in Indian where majority of general source of knowledge about pain relief methods were 58.0% from their relatives [24]. In research done in South Africa revealed that most of the women had gained their knowledge about labor analgesia from previous experience or from friends and relatives[10]. Similar findings were found in study in Nigeria where most source of information regarding epidural labor analgesia at 62.7% [22]. This common source is explained by

limited access to the health facility where epidural labor analgesia is being provided as everyone there is able to give information about epidural for analgesia. This source of information sometimes gives wrong information which can sometimes discourage receptiveness. Education about epidurals is extremely important as a cross-sectional study in Riyadh found that after health education, significant women planned to request epidural for labor analgesia with a mean score increase of 0.15 [25].

Participants who attended university are 4.05 times more likely to be aware of epidural labor analgesia as those who attended at most primary school (OR=4.05, 95% CI: 1.92-8.56, p<0.001). these findings are comparable to the study done in Nigeria where women with high education level were mostly aware of epidural labor analgesia [26].

Participants who are in second economic category are 5.97 times more likely to be aware as those who are in category one (OR=5.97, 95% CI: 0.72-46.67, p=0.088) and participants who are in the third economic category are 10 times more likely to be aware of epidural labor analgesia as those who are in the first category (OR=10.6; 95% CI: 1.40-80.30; p=0.023). Participants who had severe pain during their last labor are 3.87 times more likely to be aware of epidural labor analgesia as those who did not have pain or who had moderate pain (OR=3.87; 95% CI: 1.45-1032; p=0.007). in a study done in Nigeria showed also occupation which characterize level of socio-economic were associated with awareness of epidural labor analgesia where women with high socio-economic status were more aware of epidural labor analgesia.

Participants in the first economic category are 3.27 more likely to request labor analgesia on their next labor as those in the third economic category (OR=3.27; 95% CI: 1.16-9.29; p=0.026). this can be explained by more compliance to health education or minimal worries of category one women compare to third category.

Participants who are farmers are more likely to request epidural for labor analgesia during their next labor compared to those who are employees with salary (OR=1.32, 95% CI: 1.06-1.64), p=0.013). Participants who experienced severe pain on the last labor were 3.8 times more likely to request analgesia on their next labor as those who experienced moderate pain or no pain at all (OR=3.8; 95% CI: 1.82-8.21; p<0.001). However, even among educated women, some are frightened of the risk of pain from the epidural needle. Wrongly having or reading some

information of high level of education and high economic status of study population make them less likely to request epidural for labor analgesia.

CONCLUSION

Knowledge and receptiveness of epidural for labor analgesia are still low among women attending antenatal care in tertiary public referral hospitals in Rwanda.
Educational level, severe pain during the previous delivery are the factors associated with increased knowledge about epidural for labor analgesia.
Primiparous status, severe pain for previous labor and low income category are independently associated with the receptiveness of epidural for labor analgesia.

RECOMMENDATION

We recommend that all health care providers especially obstetricians, midwives and anesthesiologists to be involved in dissemination of information about labor analgesia including epidural analgesia especially mostly targeting women with low educational.

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ANNEX

Annex 1: data collection form

QUESTIONAIRE FOR RESEARCH

"Knowledge and receptiveness of parturients toward epidural labor analgesia"

Participant initials:

1. socio-demographics
   a. Age: …….

   b. Residence
      - District: …….
      - Sector…….

   c. Religion
      - Catholics
      - Protestant
      - Islamic
      - Other

   d. education level
      - No formal education
      - Primary only
      - Up to ordinary level
      - Up to advanced level
      - Postgraduate

   e. Occupation
      - public employee
      - private
      - farmers

   f. Monthly income: Ubudehe category
      - 1
      - 2
      - 3
      - 4

   g. Gestational age in weeks: …….

   h. Previous obstetric history (one or more answers)

      - Previously spontaneous labor
      - Induced labor
      - Elective cesarean section
      - Emergency cesarean section
      - Miscarriage
      - Fetal hypoxia

i. Parity
   - 1
   - 2
   - 3
   - More than 3

j. Number of previous deliveries
   - 0
   - 1
   - 2
   - more than two

k. Intensity of labor pain during previous delivery
   - No pain
   - Moderate pain
   - Severe pain

l. Administration of pain relief during previous delivery
   - Yes
   - No
   - Not know

m. Types of labor analgesia given for previous normal deliveries
   - Intravenous
   - Epidural
   - Combined

2. KNOWLEDGE LEVEL TOWARDS LABOR ANALGESIA
3.

a. awareness of epidural labor analgesia
   - yes
   - not
   - not sure

b. Knowledge on location of epidural labor analgesia administration
   - Knew
     - ✓ Intravenous
     - ✓ Back
     - ✓ Other: specify ……...
   - Not know

c. Awareness on contraindicate ions for epidural labor analgesia
   - No consent
   - Bleeding
   - Emergency or elective cesarean section
   - Infection on injection site
   - Other
   - Not know

d. Awareness on benefits of epidural labor analgesia
   - Knew

- Painless labor
- Good feto-maternal outcome
- Others:

- Not know

e. Awareness on disadvantages of epidural labor analgesia
   - Pain on injection
   - Chronic pain
   - Not know

f. Source of information on epidural labor analgesia
   - Experienced in previous pregnancies
   - Heard from colleague(s)
   - Read it or heard from media
   - Explained by midwifes

4. receptiveness towards epidural labor analgesia

   Will you request analgesia during labor?

   - Yes
   - no

a. If yes, what will prefer:
   - Epidural
   - Intravenous
   - Yoga
   - none

b. If not willing, what are the reasons behind the rejection
   - against the will of God
   - Want to experience normal delivery
   - Method will not work
   - Will have negative effects on my fetus
   - I will not love my baby
   - Expensive
   - Others: …….

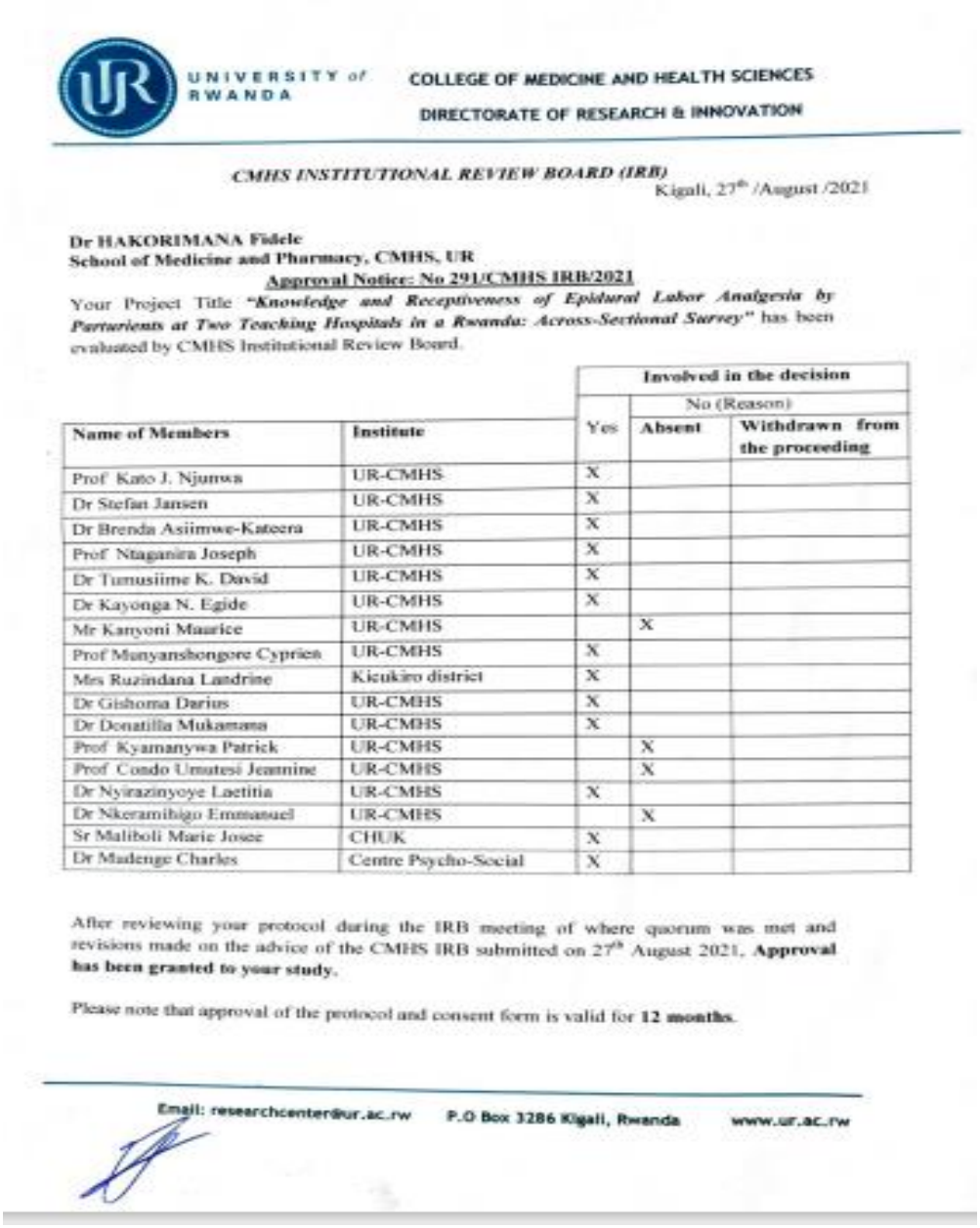
Collected by:

Date:

Location: CHUK or CHUB

Consent signed yes or no

Annex 2: APROVALS: CMHS



UNIVERSITY of RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 27th /August /2021

Dr HAKORIMANA Fidele
School of Medicine and Pharmacy, CMHS, UR

Approval Notice: No 291/CMHS IRB/2021

Your Project Title ***"Knowledge and Receptiveness of Epidural Labor Analgesia by Parturients at Two Teaching Hospitals in a Rwanda: Across-Sectional Survey"*** 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. Njunwa	UR-CMHS	X		
Dr Stefan Jansen	UR-CMHS	X		
Dr Brenda Asiimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district	X		
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Madenge 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 27th August 2021, **Approval has been granted to your study.**

Please note that approval of the protocol and consent form is valid for **12 months**.

Email: researchcenter@ur.ac.rw P.O Box 3286 Kigali, Rwanda www.ur.ac.rw

You are responsible for fulfilling the following requirements:

1. Changes, amendments, and addenda to the protocol or consent form submitted to the committee for review and approval, prior to activati changes.
2. Only approved consent forms are to be used in the enrolment of particip
3. All consent forms signed by subjects should be retained on file. The conduct audits of all study records, and consent documentation may l such audits.
4. A continuing review application must be submitted to the IRB in a time and before expiry of this approval
5. Failure to submit a continuing review application will result in terminat study
6. Notify the IRB committee once the study is finished

Sincerely,

Date of Approval: The 27th August 202

Expiration date: The 27th August 2022

Dr Stefan Jansen
Ag. Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate Studies, UR

ETHICAL APPROVAL CHUK

CENTRE HOSPITALIER UNIVERSITAIRE
UNIVERSITY TEACHING HOSPITAL

Quality Health Care
Training & Research

Ethics Committee / Comité d'éthique

10th Nov,2021 *Ref.:EC/CHUK/126/2021*

Review Approval Notice

Dear HAKORIMANA Fidele,

Your research project: ***"KNOWLEDGE AND RECEPTIVENESS OF EPIDURAL LABOR ANALGESIA BY PARTURIENTS AT TWO TEACHING HOSPITALS IN A RWANDA: A CROSS-SECTIONAL SURVEY "***

During the meeting of the Ethics Committee of University Teaching Hospital of Kigali (CHUK) that was held on 10th Nov,2021 to evaluate your request for ethical approval of the above mentioned research project, we are pleased to inform you that the Ethics Committee/CHUK has approved your research project.

You are required to present the results of your study to CHUK Ethics Committee before publication by using this link:www.chuk.rw/research/fullreport/?appid=451&&chuk.

PS: Please note that the present approval is valid for 12 months.

Yours sincerely,

Dr Emmanuel Rusingiza Kamanzi
The Chairperson, Ethics Committee,
University Teaching Hospital of Kigali

ETHICS COMMITTEE
CHUK

Scan code to verify.

" University teaching hospital of Kigali Ethics committee operates according to standard operating procedures (Sops) which are updated on an annual basis and in compliance with GCP and Ethics guidelines and regulations "

ETHICAL APPROVAL FROM CHUB

CENTRE HOSPITALIER UNIVERSITAIRE
UNIVERSITY TEACHING HOSPITAL

CLINICAL EDUCATION AND RESEARCH DIVISION
RESEARCH DIRECTORATE
RESEARCH -ETHICS COMMITTEE **Huye, November 03, 2021**

Approval Notice: No: REC/UTHB/060/2021

Dear HAKORIMANA Fidele
Email: hakorimanafidel@yahoo.com, Tel: 078217351

Reference is made to your letter requesting for data collection approval of your study entitled ***"Knowledge and receptiveness of epidural labor Analgesia by parturient at two teaching hospitals in a Rwanda: a cross sectional survey"***
Having reviewed your application and been satisfied with your protocol, your study is hereby granted ethical clearance and should be conducted within University Teaching Hospital of Butare. Please note that approval of the protocol and consent form is valid for one year starting on the issue date and shall be renewed on request.

You are responsible to fulfilling the following requirements:

- Changes, amendments and addenda to the protocol or consent form must be submitted to the committee for review and approval, prior to activation of the changes
- Only approved consent forms are to be used in the enrollment of participants
- All consent forms signed by subjects should be retained on file. The committee may conduct audits of all study records. Consent documentation may be part of such audits
- A continuing review application must be submitted to the committee in a timely fashion and before expiry of this approval
- Failure to submit continuing review application will result in termination of the study
- Notify the committee once the study is finished
- Identification of participants must be kept confidential for the duration of the study.

Sincerely

Dr. HABIMANA Emmanuel
Chairperson of Research -Ethics Committee/CHUB
Cc:

- ✓ Director General/CHUB
- ✓ Head of Clinical Education and Research Division/CHUB
- ✓ Director of Research/CHUB
- ✓ Director of Clinical Education/CHUB
- ✓ Research officer /CHUB

Digitally signed by HABIMANA Emmanuel
Date: 2021.11.03 20:01:18 +02'00'

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Website: www.chub.rw ***Hotline: 2030***