

Quality of intrapartum care in Rwanda

Management and women's experiences

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“La résilience, c’est l’art de naviguer dans les torrents” Boris Cyrulnik.

“Forgive others as God forgives us”.

ABSTRACT

The overall aim of this PhD project was to assess the quality of intrapartum care at healthcare facilities offering maternity services in Rwanda by investigating healthcare providers' management of labour and birth and women's childbirth experiences.

Study I, was a cross-sectional household study investigating how women's perceptions of care received during labour and birth were related to their overall childbirth experience. Of 921 women, 77.5% reported a good childbirth experience. Predictors of a good experience were trusting healthcare professionals, receiving enough information, being respected, receiving professional support during childbirth and having the baby skin to skin early after birth.

Study II, a qualitative study using a phenomenological lifeworld approach to interview 17 women, identified the essential meaning of a poor childbirth experience as being exposed to disrespectful care, which was constituted by neglect, verbal or physical abuse, insufficient information and refusal for the husband to be a present companion.

Study III, investigated the quality of healthcare facilities' intrapartum care for 435 healthy women with a spontaneous onset of labour at gestational term. More than 90% of the women gave birth spontaneously vaginally, but a large proportion of women were transferred from a lower health facility level to a district or a referral hospital. A partograph was used in 84.8% of the labours, the majority (88.0%) of the women did not receive any oxytocin for the augmentation of labour, 6.2% gave birth in a non-supine position, only one woman was accompanied by her husband in the birthing room and 12.5% had early skin-to-skin contact with the newborn within one hour after birth.

Study IV, measured childbirth experience, focusing on women's own capacity and perceived safety when giving birth at health facilities. Of 817 women, 83% said they had a positive experience. Internal consistency measured with Cronbach's alpha was 0.76 and 0.72 respectively for the

own capacity and perceived safety subscales. Married women vs unmarried and multiparous versus primiparous scored higher for own capacity and perceived safety during childbirth.

To conclude, the findings show that women rated their overall childbirth experiences positively, with a significant relationship to perceptions of care. The best intrapartum practices of healthy women with a spontaneous labour onset included the high non-use of labour augmentation with oxytocin and the use of the partogram. However, several areas of childbirth care need to be improved, not least to ensure respectful, women-centred care. This includes allowing women to have a companion present during labour and birth, being encouraged to give birth in a non-supine position and placing the newborn and mother skin to skin early after birth.

Keywords: Childbirth experience, Intrapartum, Quality care management, Women

SAMMANFATTNING PÅ SVENSKA

Att ge vård under förlossning är utmanande, då det kan påverka hälsan hos både mor och barn. De senaste decennierna har mödra- och neonataldödligheten och sjukligheten i Rwanda minskat avsevärt. För att fortsätta denna positiva utveckling av förbättrad mödra- och neonatalhälsa i Rwanda, så fokuserar detta doktorandprojekt förlossningsvårdens kvalitet i Rwanda.

Det övergripande syftet med projektet var att bedöma kvalitén på vård under förlossning i Rwanda, avseende vårdrutiner, förlossningsutfall och kvinnors upplevelser. Fyra studier har genomförts och har presenterats i fyra artiklar: Paper I, II, III och IV.

Studie I var en hushållstvärsnittsstudie där kvinnors upplevelser av erhållen vård i samband med förlossning relaterades till deras övergripande förlossningsupplevelse. Av 921 deltagande kvinnor rapporterade 77,5% en bra förlossningsupplevelse, definierat som en skattning på ≥ 8 av 10. Prediktorer för en bra upplevelse var tilltro till personalen (OR 1,73; 95% CI 1,20–2,49), att få tillräckligt med information (OR 1,44; 95% CI 1,03–2,00), att bli mött med respekt (OR 1,69; 95% CI 1,18–2,43), att få professionellt stöd (OR 1,75; 95% CI 1,20–2,56), samt att ha barnet hudmot hud direkt efter födseln (OR 2,21; 95% CI 1,52–3,19) (Paper I).

Studie II var kvalitativ med en fenomenologisk livsvärldsansats. Bland frågorna besvarade av kvinnor i den första studien, fanns en fråga där de skulle skatta sin förlossningsupplevelse från 0 (mycket dålig) till 10 (mycket bra). Av de 898 kvinnorna som besvarade denna fråga skattade 28 kvinnor (3,1%) förlossningsupplevelsen som dålig (0-4). Av dessa intervjuades 17 kvinnor om innebörden i denna låga skattning. Den fenomenologiska analysen visade att den essentiella innebörden av en dålig förlossningsupplevelse var: att vara utsatt för respektlös vård, och som bestod av negligering, fysisk och/eller verbal misshandel, otillräcklig information, och förbud att ha sin man som följeslagare under förlossningen. Känslor av övergivenhet, förnedring, skam och

förolämpning fanns närvarande hos kvinnorna och detta skapade känslor av osäkerhet, rädsla och misstro (Paper II).

I studie III studerades kvalitén på vård under förlossningen hos 435 kvinnor med normal graviditet och spontan förlossningsstart i fullgången tid. En tvärsnittsstudie genomfördes under åtta veckor, 2014-2015, på 18 vårdinrättningar i Rwandas norra provins och i huvudstaden Kigali: åtta vårdcentraler, sju distriktssjukhus, ett provinssjukhus, ett privat sjukhus och ett referenssjukhus. Data samlades in från journaler samt genom ett specialkonstruerat frågeformulär i vilket ett instrument för mätning av Bologna-score ingick. Samtliga kvinnor biträdades under förlossningen av utbildad personal: barnmorskor (49,4%), sjuksköterskor (28,8%) och läkare (22,0%). Platsen för förlossning var vårdcentraler (29,0%), distriktssjukhus (40,0%) och referenssjukhuset (31,0%). Medelvärde av Bolognascore var 2,03 av maximalt 5 (spridning: 0-4). Endast en kvinna (0,2%) hade en följeslagare närvarande (hennes man). Partogram användes vid majoriteten av förlossningarna (84,8%) och majoriteten (88,0%) fick inget värförstärkande dropp. Få kvinnor (6,2%) födde sitt barn på annat sätt än i liggande position och en liten andel (12,4%) hade tidig kontakt hud-mot-hud med sitt nyfödda barn (Paper III).

I studie IV studerades kvinnors förlossningsupplevelse innan hemgång från hälsovårdsenheten. Fokus var på egen kapacitet och upplevd trygghet. Av 817 kvinnor, som inkluderades i studien, skattade 83,0% en god förlossningsupplevelse som helhet, definierat som ≥ 8 på en skala 0-10. Reliabilitet mätt med Cronbachs alfa var 0,78 och 0,76 för delskalorna egen kapacitet och upplevd trygghet. Omfödernskor skattade bättre upplevelser än förstfödernskor, vilket stämmer överens med tidigare forskning. Dessutom skattade gifta kvinnor bättre upplevelse än ogifta kvinnor (Paper IV).

Sammanfattningsvis visade studierna att kvinnor 1 till 13 månader efter förlossning skattade förlossningen som helhet övervägande positiv, och där det fanns samband mellan helhetsupplevelsen och upplevelse av erhållen vård. Hos kvinnor med dålig förlossningsupplevelse framträdde att vården var respektlös. En granskning av vård av kvinnor med normal

graviditet och spontan förlossningsstart i fullgången tid visade att alla kvinnor fått vård av en professionellt utbildad, varav cirka en tredjedel av barnmorskor, att förlossningen hos merparten följts genom ett partogram och att användning av värkförstärkande oxytocindropp var låg. Flera förbättringsområden identifierades för att fullt ut bedriva en respektfull och säker vård, såsom att låta kvinnan få med en stödjande följeslagare under förlossningen, att främja annan förlossningsställning än ryggläge, samt att barnet skall läggas hud mot hud hos mamman tidigt efter förlossningen.

LIST OF PAPERS

This thesis is based on the following studies, referred to in the text by their Roman numerals.

- I. Mukamurigo, J., Berg, M., Ntaganira, J., Nyirazinyoye, L., and Dencker, A. Associations between perceptions of care and women's childbirth experience: a population-based cross-sectional study in Rwanda. *BMC Pregnancy Childbirth*. (2017); 17:181.
- II. Mukamurigo, J., Dencker, A., Ntaganira, J., & Berg, M. The meaning of a poor childbirth experience - A qualitative phenomenological study with women in Rwanda. *PLoS One*, (2017). 12 (12), e0189371.
- III. Mukamurigo, J., Dencker, A., Ntaganira, J., Nyirazinyoye, L., Berg, M. Quality of intrapartum care for women in Rwanda undergoing normal pregnancy and spontaneous start of labour: a prospective cross-sectional study. *Sexual & Reproductive Healthcare*. 2019, (19): Pages 78-83.
- IV. Mukamurigo, J., Berg, M., Nyirazinyoye, L., Bogren M., Dencker, A. Childbirth experience questionnaire (CEQ): a cross-sectional health facility-based study in Rwanda. *Manuscript submitted*.

CONTENTS

Abbreviations	iv
Preface	1
1. Introduction	3
1.1 Problem statement.....	3
1.2 Intrapartum care and its quality.....	3
1.3 Management of intrapartum care	5
1.4 Women’s childbirth experience	6
1.5 Rwanda profile	8
1.5.1 Geography and demography	8
1.5.2 Healthcare system in Rwanda	10
1.5.3 Health insurance system	13
1.5.4 Quality of care in Rwanda	14
1.5.5 Achievement related to intrapartum care and maternal health	16
2. Rationale	18
3. Aims.....	20
3.1 Specific aims	20
4. Methods	21
4.1 Research design.....	21
4.2 Participants, data collection and analysis	24
1. Study I.....	25
2. Study II	27
3. Study III.....	29
4. Study IV	31
5. Ethical Considerations.....	33
6. Results	35
6.1 Study I	35
6.2 Study II.....	38
6.3 Study II.....	39
6.4 Study IV	43
7. Discussion	45
7.1 Predictors of a good childbirth experience (Study I).....	45

7.2 Disrespectful care – the essential meaning of a poor childbirth experience (Study II)	46
7.3 Quality of intrapartum care for healthy women with spontaneous onset of labour (Study III)	48
7.4 Women’s childbirth experiences emphasising own capacity and perceived safety (Study IV)	51
7.5 Methodological considerations	54
8. Conclusions	57
9. Future perspectives	59
10. Acknowledgements	60
References	63
Appendix	79

ABBREVIATIONS

ANC: Antenatal care
AOR: Adjusted Odds Ratio
APPP: Africa Power and Politics Programme
CHW: Community Health Workers
CI: Confidence Interval
CMHS: College of Medicine and Health Science
CS: Caesarean Section
IMPACT: Integrated Management Complications and Childbirth
GDP: Gross Domestic Product
HIV: Human Immunodeficiency Virus
MatHeR: Maternal Health Research Programme in Rwanda
MDG: Millennium Development Goals
MMR: Maternal Mortality Ratio
MoH: Ministry of Health
NCDs: Non-Communicable Diseases
NISR: National Institute of Statistics of Rwanda
OR: Odds Ratio
PhD: Doctor of Philosophy (Philosophiae Doctor)
PNC: Postnatal care
PPH: Postpartum haemorrhage
ROC: Receiver Operating Characteristic
SDG: Sustainable Development Goals
SMS: Short message services
SIDA: Swedish International Development Co-operation Agency
SPH: School of Public Health
UN: United Nations
WHO: World Health Organisation
WISN: Workload Indicators of Staffing Needs
UR: University of Rwanda

PREFACE

Before my PhD studies, I had a little experience of working as a nurse at maternal health care services. I was shocked to see how women suffered from disrespect from healthcare providers during their intrapartum period.

Also, as a woman, I had a chance to give birth in my country and in a European country, Belgium. I was impressed by the enthusiasm in the labour ward, the time and care received during intrapartum care and even the postpartum care with physiotherapy exercises.

In addition, in Rwandan culture, a woman is given exceptional consideration, i.e. a Rwandan proverb says: “Akabura ntikaboneke ni nyina w’umuntu”, which means that a mother is an irreplaceable person.

All these observations, together with my personal experience, motivated me to apply for this project.

This thesis is part of MatHeR programme, the Maternal Health Research in Rwanda, aiming at improving the quality of maternity care in Rwanda.

1. INTRODUCTION

This thesis focuses on the management of intrapartum care. It is part of Maternal Health Research Programme. Others components of maternity care have been discussed in three other theses of this program ¹⁻³.

1.1 Problem statement

Globally, maternal and newborn mortality remains a challenge ⁴. Poor quality of intrapartum care makes a substantial contribution to maternal and neonatal mortality (11). The time around childbirth is critical to the survival of women and their newborns. It was estimated that, in 2015, about 303,000 women died from pregnancy or childbirth-related complications. Of them, 99% of all maternal deaths occurred in developing countries ⁵. Among low-income countries ^{4,6}, sub-Saharan Africa has the poorest rates of global maternal health outcomes ^{4,7,8}. Statistics up to 2015 reveal that, in sub-Saharan Africa, 200,000 maternal deaths, one million newborn deaths and one million stillbirths occurred every year ^{4,9-11}. However, despite the remaining risk of dying for mothers and newborns, ¹⁰ substantial improvements in survival have been made since 1990 ^{5,11}.

1.2 Intrapartum care and its quality

The intrapartum period consists of three parts: the active phase starts with labour, where the first stage is the period characterised by regular painful uterine contractions, from 5 cm until full cervical dilation. The second stage is the period of time between full cervical dilation and the birth of the baby, during which the woman has an involuntary urge to bear down, as a result of expulsive uterine contractions. The third stage of labour is the one that ends two hours after the delivery of the placenta and, in the normal way of birthing, the woman is discharged from the healthcare facility to her home ^{12,13}.

The overall objective of intrapartum care is for a healthy mother to give birth to a healthy child, with a minimum of intervention compatible with medical safety ¹⁴. Good quality of care for pregnant women and their

newborns requires the appropriate use of effective clinical and non-clinical interventions, a strengthened healthcare infrastructure and optimum skills and attitudes among healthcare providers ^{15,16}.

To ensure positive maternal and newborn health outcomes, high quality of intrapartum care, especially through the provision of spontaneous vaginal births with a minimum of medico-technical interventions, is central ^{17,18}. The outcome of the care for women and newborns around the time of birth in healthcare facilities reflects the evidence-based practices that are used and the overall quality of services provided. The quality of care during childbirth in healthcare facilities depends on the physical infrastructure, human resources, knowledge, skills and capacity to deal with both normal pregnancies and complications that require prompt, life-saving interventions ^{19,20}. Addressing quality of care is central to reducing maternal and newborn morbidity and mortality, which is essential in order to achieve the Sustainable Development Goals (SDG) health-related targets. The SDGs, particularly SDG 3: ensure healthy lives and promote well-being at all ages and SDG 5: achieve gender equality and empower all women and girls, as well as working towards reduced inequalities (SDG 10), mark a commitment to improve the global maternal and newborn health by reducing the maternal mortality ratio (MMR) to fewer than 70 deaths per 100,000 live births by 2030 ²¹. Complications from the period around childbirth are therefore the most critical in order to save the maximum number of lives ¹⁷.

Quality of care comprises structure, processes of care and outcomes ²². Structure refers to what is needed to provide care such as medicines, equipment and human resources. Processes of care refer to clinical procedures and treatments and the client-provider interpersonal relationship, including the way information is shared and decisions about care are made. Finally, the outcomes are the changes in health status and patient satisfaction ²³. These components, together with the two perspectives of quality (provider/technical perspective and the experience of care), are included in the WHO quality of care framework for maternal and newborn care ¹⁴. This framework consists of eight domains of quality of care, namely: Evidence-based practices for the routine care and

management of complications; actionable information systems; functional referral systems; effective communication; respect and preservation of dignity, emotional support, competent, motivated human resources; and essential physical resources available ²⁴. All these components should be assessed, improved and monitored within the health system ¹⁴. The WHO quality of care framework is also useful when it comes to understanding the quality of care and especially intrapartum care provided in Rwanda.

1.3 Management of intrapartum care

Labour and birth are periods of significant transition to motherhood. The management of intrapartum care impacts the health of the mother and newborn and is essential to make motherhood safe for all women. It is important that the management of intrapartum care should promote a healthy physiological birth and thus leave the process as undisturbed as possible. The scope of intrapartum care is to promote the management and assurance of normal physiological labour, birth and the post-partum period ²⁵. A normal physiological birth is characterised by the spontaneous onset and progression of labour to vaginal birth at term (37-42 weeks) for a singleton infant in cephalic presentation. It includes biological and psychological conditions that promote effective labour which results in the vaginal birth of the infant and placenta with a physiological blood loss. The physiological birth facilitates the optimal newborn transition through skin-to-skin contact and which keep the mother and infant together early after birth. This supports the early initiation of breastfeeding ²⁶.

A central part of the management and provision of high-quality intrapartum care therefore involves developing individualised labour management algorithms that optimise women-centred care ²⁷ and a spontaneous vaginal birth with a minimum of medico-technical interventions ^{17,18}. Most of the 140 million births every year occur without complications. However, research has shown that many common practices, such as routine intravenous fluids, continuous electronic foetal monitoring, routine episiotomies and unnecessary caesarean sections, have rapidly increased and do more harm than good ²⁸. It is well known that

interfering with the normal physiological process of labour and birth in the absence of medical necessity increases the risk of complications for mother and newborn. It is also well known that increasing the medicalisation of the normal childbirth processes undermines a woman's own capability to give birth and negatively affects her birth experience ^{29,30}.

To reduce the rapid increase in interference during the normal physiological process of labour and birth, the WHO recommends a variety of practices for a positive childbirth experience. These practices include having a companion of choice during labour and childbirth; safeguarding respectful care and good communication between women and health providers; upholding privacy and confidentiality; permitting women to make decisions about their pain management; labour and birth positions and the natural need to push ¹². Several studies have shown that evidence-based maternity care is linked to the effective quality of intrapartum care ^{17,18,31-37}. A study conducted in a district hospital revealed shortfalls in clinical practice and the referral system ³⁸. Another study conducted later in multicentre district hospitals demonstrated the high level of severe maternal outcome ³⁹. The studies conducted at tertiary level concluded that the high prevalence of observed peritonitis may reflect the suboptimal intraoperative and intrapartum management of high-risk patients at district hospitals ^{40,41}. A study in the eastern province of Rwanda of the utilisation of the partogram among nurses and midwives in health facilities showed that 36.6% of nurses and midwives did not receive any in-service training on how to manage women in labour. In addition, despite a fair knowledge of the partogram among nurses and midwives ⁴², only 41.22% reported having used the partogram properly, while 58.78% reported not having done so. However, in Rwanda, information specifically relating to evidence-based practices associated with intrapartum care is still lacking.

1.4 Women's childbirth experience

Giving birth is a major experience in a woman's life and has implications for a woman's health and her wellbeing ^{30,43,44}. A positive childbirth experience is important for the woman's wellbeing, facilitates the mother-

child bonding and may have implications for the future health of both the mother and baby. The childbirth experience is associated with several factors, which influence the woman's overall experience²⁹. Some of those factors are: having a companion of choice during labour and childbirth; the provision of respectful care and good communication between women and health providers; maintaining privacy and confidentiality; allowing women to make decisions about their pain management, labour and birth positions and the natural urge to push; and feeling in control of what is happening⁴⁵. The most important factor contributing to a woman's satisfaction with childbirth is having her expectations met⁴⁶.

In contrast, a negative childbirth experience is associated with disrespectful or even abusive care²⁷. Mistreatment in terms of both the physiology and emotions of women during childbirth is a violation of human rights⁴⁷. The consequences of a negative childbirth experience are poorer quality of life, lower self-rated health, a persistent negative memory of pain, development of post-traumatic stress disorder and a persistent fear of childbirth⁴⁸. A qualitative systematic review and thematic synthesis of women's perceptions and experiences, conducted on disrespectful intrapartum care during facility-based delivery in sub-Saharan Africa, revealed a prevailing model of intrapartum care that is institution centred instead of woman centred.⁴⁹

A study conducted in Tanzania showed that both respectful and disrespectful care by midwives was observed in two health facilities in an urban area¹⁶. In the same study, several types of physical and psychological abuse were observed that had not been reported previously and the study revealed that weak nursing and midwifery management contributed to the disrespect and abuse factor¹⁶. Another study of the prevalence of disrespect and abuse during facility-based childbirth in the same urban area of Tanzania revealed that 15% of women reported experiences of at least one instance of disrespectful and abusive behaviour¹⁶. Evidence from direct observations of client-provider interactions during labour and delivery confirmed high rates of some disrespectful and abusive behaviour¹⁶.

A systematic review of the disrespect and abuse of women in Nigeria revealed that undignified care in the form of negative, poor and unfriendly provider attitudes was the most frequently reported type of abuse ⁵⁰. In several other countries, including Rwanda, and direct observation of respectful maternity care revealed that, in overall terms, women were treated with dignity, but many of them experienced poor interactions with providers and were not well informed about their care ⁵¹.

1.5 Rwanda profile

Rwanda, the country of focus for this thesis, was the only country in sub-Saharan Africa to realise the fifth of the eight Millennium Development Goals (MDGs) and reduced its maternal mortality ratio (MMR, mortality per 100,000 live births) by 78% from 1,300 in 1990 to 290 in 2015 ⁵, see Figure 5.

1.5.1 Geography and demography

Rwanda is a landlocked country in Central Africa (Figure 1), situated in the Great Lakes region. Rwanda's landscape is mainly made up of high altitude hills, hence the name "Country of a Thousand Hills".



Figure 1. Rwanda geography in African map

Source:<http://ontheworldmap.com/rwanda/rwanda-location-on-the-africa-map.jpg>⁵².

Rwanda is a post-conflict country with a population of around twelve million. Following the genocide in 1994, the country has made remarkable socioeconomic progress⁵³, with annual GDP growth averaging 8.2%. One result of this is that Rwanda has doubled its life expectancy in the past few decades, to 61.3 years for females and 58.1 years for males. The illiteracy rate declined from 29% to 23% among women aged 15 to 49 years and from 22% to 19% among men aged 15 to 59 years⁵⁴. In addition, Rwanda has made great progress in promoting gender equality, driven largely by strong government commitment, making Rwanda the first country in the world to have more than 50% female members of parliament^{55,56}.

However, as Rwanda is a patriarchal country, at community level gender equality laws and policies are challenging power relations and, as a result of existing power inequalities at household level, both men and women experience gender equality-created dilemmas, worries and fears. In order to deal with these concerns, men and women adopt a strategy of silence in the household as one of the means of coping with the newly created gender changes⁵⁷.

In reproductive health, Rwanda is struggling to involve men (as part of HIV testing during antenatal care, for example) but, due to traditional gender norms, this situation is still challenging⁵⁸. In addition, as in other African countries, Rwandan men are still denied the opportunity to be with their wives in birth rooms^{59,60}.

1.5.2 Healthcare system in Rwanda

The health service packages established in Rwanda have three main purposes: 1) to define the standard packages of services to be delivered at each level of the healthcare system, 2) to provide a guide for the MoH, private sector and non-governmental organisations⁶¹ and donors about the types of staff and equipment needed to provide the service packages and 3) to promote a health referral system that integrates all levels of services⁶². Ensuring the provision of quality health care is challenging for any healthcare system¹⁷. However, in a collapsed healthcare system, like Rwanda's, where over 80% of the healthcare professionals were killed or fled the country during the genocide⁵⁴, the provision of quality care around

the time of childbirth is especially challenging, as this requires skilled health workers in functioning facilities with medicines and equipment available around the clock^{18,63}. Post-genocide, Rwanda confronted the challenge of rebuilding its health care system, while simultaneously re-establishing social and political order based on inclusiveness, reconciliation and unity. Through its new health reforms, Rwanda is making great progress towards attaining universal health coverage⁵⁴.

The healthcare system in Rwanda is characterised by a decentralised public sector with healthcare services complemented by the private sector (i.e. private clinics), primarily in urban settings. On the other hand, in the rural areas, the public healthcare system is complemented by faith-based health facilities⁶⁴. The public healthcare delivery system is structured into three levels of facilities (Figure 2).

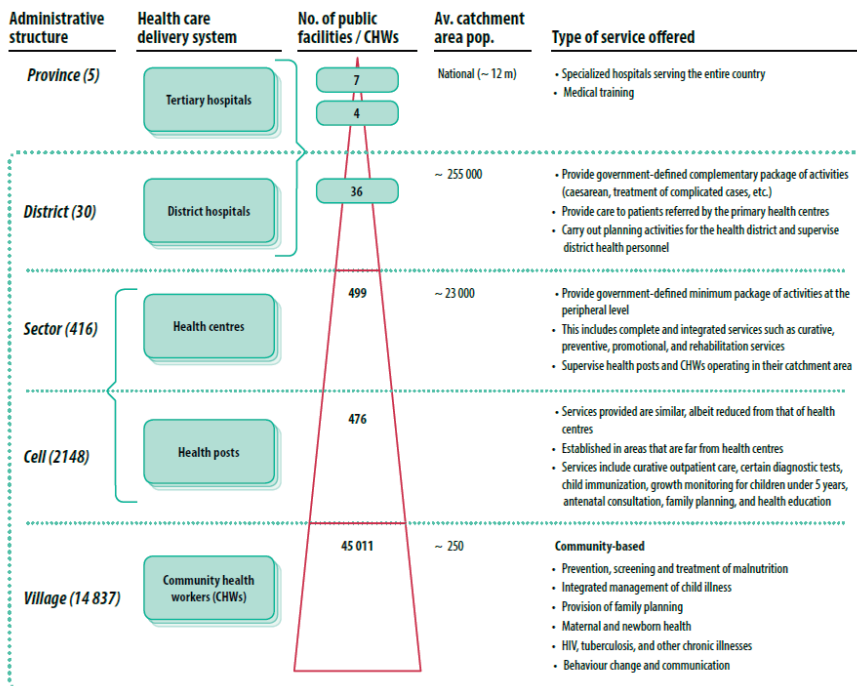


Figure 2. Representation of the healthcare system of Rwanda.

Source: Adapted from Ministry of Health, Health Service Packages for Public Health Facilities⁶⁵.

With the community health workers (CHW) at the bottom of the pyramid serving the population at the household level, the first formal level of care includes health centres and health posts providing primary treatment and care. The second level of the system consists of district hospitals, followed by the third level in the system, consisting of the tertiary level at the top with provincial and national level referral and teaching hospitals ⁶⁶. However, a study conducted in district hospitals showed a deficit in clinical practice and the referral system ³⁸.

The benefits provided by level are: at Health Centre level a “Minimum package of activities” including curative, preventive, promotional and rehabilitative services; the district hospital provides a “complementary package of activities for patients referred from a primary health centre; and referral hospital level “tertiary services” package, defined by the Government of Rwanda for patients referred from district hospitals ⁶⁷.

In Rwanda, at health centres, intrapartum care for women with uncomplicated pregnancies, as well as the expected normal labour and birth, is provided by nurses and midwives. In the event of complications, the pregnant woman is transferred to the district hospital, or to a teaching/university hospital, where, in addition to an experienced nurse and midwife, there are physicians and gynecologists who provide care.

Human resources for health form the core of a country’s health system. Without them, no healthcare services can be delivered ⁶⁸. In Rwanda, the cadres range from doctors, specialists in obstetrics, gynecologists, nurses, midwives and auxiliaries, to CHW. In Rwanda, as in most sub-Saharan Africa countries, the distribution of human resources for health is uneven. Strategies to improve the availability of human resources for health are an integral part of the health systems strengthening policy in the country. To ensure that everyone has equitable and geographic access to the healthcare services they need, without experiencing financial hardship, a cadre of trained CHWs were introduced to provide basic health services, including maternal and newborn care according to WHO recommendations ⁶⁹. Linking communities with the healthcare system, each village has a pair of CHWs (called a Binome: a male and a female) who are responsible for

community health, nutrition and HIV/AIDS prevention. In addition, each village has a maternal health worker referred to as an Animatrice de Santé Maternelle ^{70,71}, who manages infant and pre- and postnatal maternity care. Each village also has a CHW in charge of social affairs who is dedicated to addressing the well-being of individuals and the community ^{71,72}. This function has been recently introduced as a mean to reduce the frequency of NCDs ⁷³.

However, Rwanda suffers from a general shortage of nurses, especially midwives ^{74,75} and an even greater shortage of nurses who have received adequate education to provide the level of care they are called on to give ⁷⁶. A study showed that a wide gap exists between evidence-based standards and levels of provider competence ⁷⁷.

1.5.3 Health insurance system

The Government of Rwanda has set a goal of ensuring universal access to equitable, affordable quality healthcare services for all Rwandans. Through a national policy established in 2004, health insurance coverage is compulsory by law in 2008 ⁷⁸. The organisational structure of health insurance in Rwanda comprises three schemes. The majority (85%) of the insured population without a monthly salary, are covered by the Community-Based Health Insurance (CBHI) scheme, Mutuelles de Santé, with annual fees that vary from 3,000 to 7,000 Rwandan francs per person based upon household economic status (Ubudehe) and 200 Rwandan francs of co-payment for each visit. The government covers the enrollment of indigents in CBHI by paying 2,000 per person. Military personnel enrolled in a separate Military Medical Insurance ⁴ scheme account for approximately 6% of the total population. Civil servants are enrolled in another scheme called Rwanda Assurance Maladie (RAMA). Private health insurance products are also available for purchase. Six of eight private general insurers in the country offer medical insurance plans ⁶⁷. Despite an improvement in overall population health status and the community-based funding of insurance coverage, over 90% now deliver their babies in health facilities assisted by skilled birth attendants or unassisted ^{65,79}. Although Rwanda has improved its health outcomes, its healthcare system still faces

some serious challenges, particularly concerning the provision of quality care ^{80,81}.

1.5.4 Quality of care in Rwanda

In Rwanda, the right to quality healthcare services is acknowledged in its national constitution. Notable progress has been recorded in improving the health outcomes of the population ⁸² and health is one of the main priorities on the country's political and development agenda and strategic development planning. Through the Ministry of Health, the quality assurance department is responsible for coordinating quality-related programmes. The quality of health care services in Rwanda is constantly and regularly examined through accreditation, performance-based financing and integrated supportive supervision. Each year, district mayors sign performance contracts with the President of Rwanda for all public sectors, including health and are accountable for achievement of health-related indicators. District mayors, in turn, utilise performance-based contracts (called imihigo) with health facilities to encourage the fulfilment of standards, with subsidies and financing contingent on performance ⁶⁵.

To improve health outcomes, Rwanda has adopted a strategic framework of institutionalised quality, at both central and facility levels ^{83,84}. See Figure 3.



Figure 3. Institutionalising quality care in Rwanda

Source: Ministry of Health, Health Service Packages for Public Health Facilities ⁶²

According to the Ministry of Health (MoH), with support from Management Sciences for Health (MSH), has developed the national quality improvement strategy: the quality triangle in Figure 3 highlights the fact that quality must be defined, measured, improved and finally rewarded. The outside circles show the enabling environment necessary to institutionalise quality of care, which correspond to Rwanda’s accreditation programme.

Evidence reveals that accreditation programmes improve the process of care provided by healthcare services and clinical outcomes ⁸⁵. Rwanda integrate the accreditation component in health facilities.

Figure 4 illustrates the structure of accreditation in health services in Rwanda at both central and facility levels.

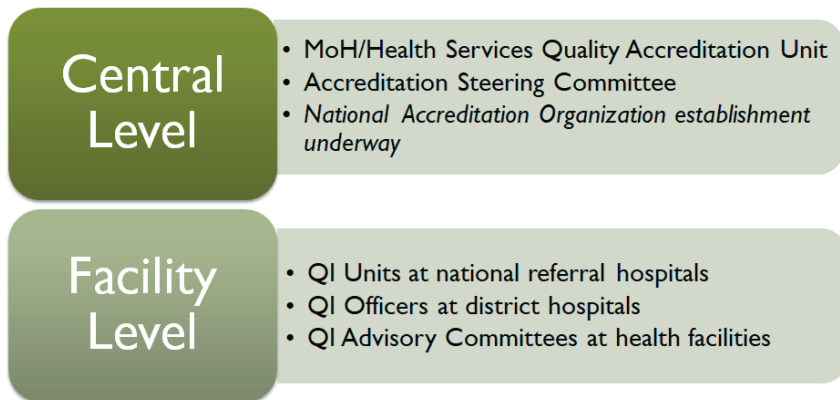


Figure 4. Structures to govern quality

Source: Ministry of health, health service packages for public health facilities ⁶²

1.5.5 Achievement related to intrapartum care and maternal health

Since 2015, through the decentralised healthcare system, Rwanda registered 99% of pregnant women having at least one ANC visit with a skilled provider, but only half of pregnant women report having the recommended four standard ANC visits ⁵⁴. At the same time, around 91% of all births occur in healthcare facilities, a substantial improvement since 2010, when it was only 69% ⁵⁴. In addition, the maternal mortality rate has been reduced by more than the 75% requirement of MDG 5, from 1,300/100,000 live births to 567/100,000 live births (2005) and 290/100,000 live births (2015) see figure 5.

Rwanda maternal mortality ratio estimates

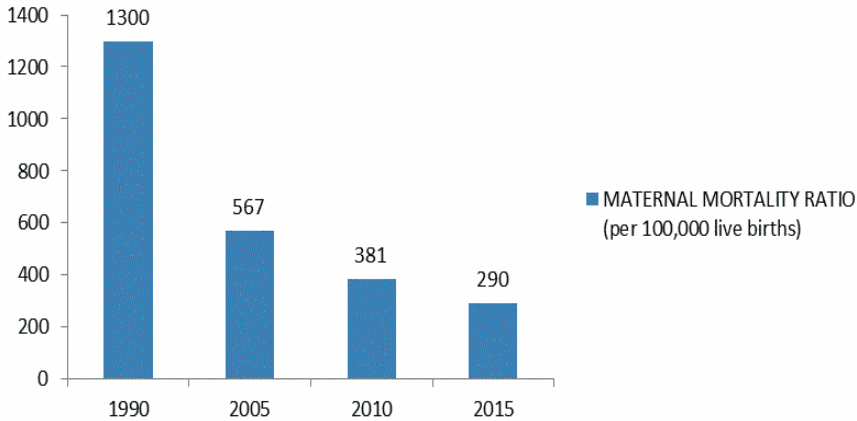


Figure 5. Rwanda estimates of the maternal mortality ratio

Source: National Institute of Statistics of Rwanda, Rwanda Ministry of Health, Rwanda Demographic and Health Survey 2015 ⁵⁴

This reduction was mainly related to the high coverage of health insurance, Performance-Based Financing ⁸⁶, and the work of Community Health Workers ⁸⁷. Each village in Rwanda has a community health worker, ‘a female known as a mobiliser of maternal health’, who is responsible for community-based interventions during and after pregnancy and reporting on every contact using a short message service (SMS) mobile phone-based system using Rapid SMS ⁸⁸. The system was set up to improve maternal and child health, at no cost to users, through communication to ensure appropriate referrals and seek timely, appropriate medical help for an obstetric and newborn emergency by reducing the time that elapses between a health crisis and care.

Rwanda has made impressive achievements in maternal health ⁵⁴. However, little is known about the contribution of that success to the quality of intrapartum care. This thesis therefore explores the quality of intrapartum care by investigating women’s experiences of childbirth and the management of labour and birth in Rwanda. The thesis will attempt to identify factors related to healthcare that can be improved. This knowledge could inform decision- and policy-makers to identify strategies to improve the provision of intrapartum care.

2. RATIONALE

Improving maternal health is a key foundation for every nation, community and family. Millennium development goals applied various strategies to overcome the gaps resulting in maternal health morbidity and mortality from global to local levels. In Rwanda, remarkable improvements have been made to reduce maternal morbidity, but it still remains high ⁸⁹.

Available research evidence highlights many deficiencies in essential quality of care during the intrapartum period. Firstly, there is a deficit of practices and competence, which is also related to the healthcare system. The literature shows that a wide gap exists between evidence-based standards and levels of provider competence. Similarly, there is a deficit in the referral system and in clinical practice specifically relating to evidence-based practices associated with intrapartum care. Secondly, even if most women describe positive childbirth experiences, a substantial proportion of women still suffer from negative experiences, including less respectful care relating to childbirth in Rwanda. For example, studies show poor interaction between women and providers. Many women are not well informed about their care and their partners are still denied the opportunity to be with them in birth rooms.

In spite of an excellent overall achievement in the MMR, there is still a need for further reductions and to maintain this achievement. As a result, one of the motivating factors for undertaking this study is continuing concern in Rwanda relating to the reduction of maternal, neonatal and child morbidity and mortality.

In Rwanda, as elsewhere in the developing world, there is a lack of information relating to the quality of intrapartum care. An earlier study of Quality of Care for Prevention and Management of Common Maternal and Newborn Complications conducted at 72 healthcare facilities revealed a level of quality that was frequently below the standards recommended in the WHO's IMPAC manual of evidence-based protocols and guidelines 88. To our knowledge, no such studies, especially of intrapartum care, have ever been conducted in Rwanda. So, another reason for conducting this

study was possibly to contribute to the body of knowledge of maternal and neonatal health in Rwanda. The results of this study may have the potential to enable the Ministry of Health to focus more effectively on strengthening the health care delivery system at all levels with respect to intrapartum care.

3. AIMS

The general aim was to assess the quality of intrapartum care at healthcare facilities offering maternity services in Rwanda by investigating the management of labour and birth for women by healthcare providers and women's childbirth experiences.

3.1 Specific aims

Study I

To investigate how women's overall childbirth experience in Rwanda related to their perceptions of childbirth care (Paper I)

Study II

To explore the meaning of a poor childbirth experience, as described by women who had given birth in Rwanda (Paper II)

Study III

To investigate the quality of intrapartum care provided at healthcare facilities to women undergoing normal pregnancy and spontaneous full-term labour (Paper III)

Study IV

To measure childbirth experience, focusing on women's own capacity and perceived safety when giving birth in health facilities (Paper IV)

4. METHODS

4.1 Research design

To answer the research questions both quantitative and qualitative approaches were used and data was collected in Rwanda. A total of four studies, I, II, III and IV, were conducted as part of this thesis. Three quantitative cross-sectional studies (I, III and IV) were conducted to describe, compare, assess and measure in relation to study objectives. Study I predicted the perceptions of quality of care related to a good childbirth experience among women who had given birth between 1 and 13 months. In Study II a qualitative phenomenological method was used in order to explore the lived experience and meaning of a poor childbirth experience, among women in Rwanda. Study III measured the practices and interventions in managing labour and birth for healthy women with the spontaneous onset of labour in health facilities, using calculations of the Bologna score and statistical tests. Study IV measured women's childbirth experience, emphasizing women's own capacity and perceived safety to test the hypotheses relating to the differences in mean scores between known groups.

Data were collected in two of the five provinces in Rwanda: Kigali-City and the Northern Province, where there were three data collections. One dataset using a questionnaire was collected in households and one qualitative data collection using interviews and the other one in the same area, at health facility level, using the questionnaires. In Studies I and II, the target population was women who had given birth one to thirteen months before. So, in collaboration with MatHeR, a sample of 922 women was calculated, based on the estimated prevalence of hypertensive disorders during pregnancy (10%) with a precision of 2.5% and 1.5% of a design effect in households. For the healthcare facilities-based studies (III and IV), the target population consisted of women who gave birth in the selected health facilities during the time of the data collection. A sample size of 817 women was calculated using an estimation of the prevalence of caesarean birth of 14.8% in Rwanda in 2013, with an absolute precision of

5%. A non-response rate of 10% was considered. An overview of the global research design of the four studies is presented in Table 1 and Figure 6.

Table 1. Overview of methodological research for four studies design, studies I-IV

	Study I	Study II	Study III	Study IV
Design	Cross-sectional, household-based study	Phenomenology study lifeworld approach	Cross-sectional, health facility-based study	Cross-sectional, health facility-based study
Data collection and participants	Interview using a structured questionnaire to 921 women, 1-13 months after birth, randomly selected	Individual interviews with 17 women who rated overall experience of childbirth as bad (≤ 4) on a scale from 0 (very bad) to 10 (very good)	Interview using a structured questionnaire to 435 women with a normal pregnancy and a spontaneous start of labour at term, before discharge from the health facility	Interview based on two subscales of CEQ and medical records with 817 women, selected with a large number of births, before discharge
Analysis	Descriptive statistics, univariable and multivariate analysis at 5% significance level. Adjusted odd ratios are presented.	Reflective lifeworld approach exploring the meaning of the phenomenon: a poor childbirth experience	Descriptive and comparative statistical tests for comparisons between groups. All the tests were two sided with an alpha of 0.05.	Descriptive statistics, reliability was assessed using Cronbach's alpha and Cohen's effect size. Mann-Whitney U test was used for comparisons of scale scores between groups.

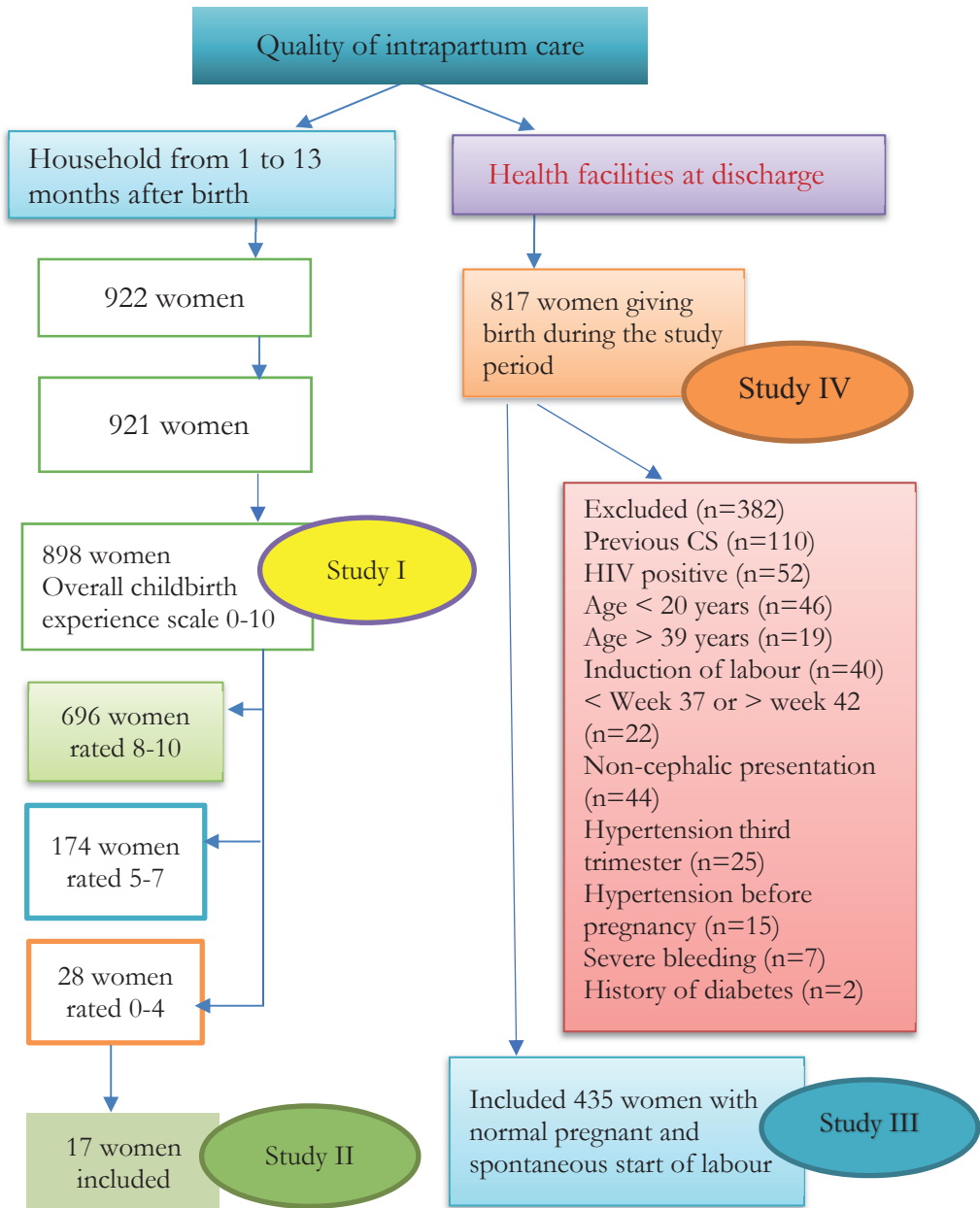


Figure 6. Flowchart of 4 studies of the thesis

4.2 Participants, data collection and analysis

Included participants were women who had given birth. Two datasets were collected using two questionnaires, one in a household study and another at health facilities. These questionnaires were developed by the research team of MatHeR based on earlier research and validated questionnaires. Both questionnaires were translated from English to Kinyarwanda by a native professional physician translator. Eight trained data collectors collected all data, composed by female nurses, midwives and clinical psychologists. The community health workers in charge of maternal health helped to identify women to include in the study from their monthly reports, maternal health outcomes, and attendance at the health centre. The same workers also helped to contact women at the village and household levels. In study II, the women who rated low overall childbirth experience from zero to four out of ten, were recontacted by the same health worker for an appointment to make an interview.

1. Study I

Participants and data collection: a cross-sectional household study was conducted in Kigali City and the Northern Province, from July to August 2014. An example of the context and some households in which data was collected is shown in the following picture.



Figure 7. Sample picture of households in the study (taken by Judith M).

Forty-eight villages were selected randomly from a complete list of 4,791 villages in the study area. A proportionate number of 921 women who gave birth between one and 13 months earlier, considering that women one month after birth, all women including those giving birth normally, or those who had complications including a stillbirth might be at their homes. Normally, a Rwandan woman who has an uncomplicated birth in the maternity service is discharged after one to three days. The discharge within three days was found to be protective (37). Nine hundred and twenty-one women who gave birth one to 13 months earlier were asked to rate their overall experience of childbirth from 0 (very bad) to 10 (very good). Only one woman was questioned per household throughout the study. The questionnaire included statements that comprehensively addressed the

childbirth experience, including women's perceived quality of care variables and overall childbirth experience. The dependent variable was assessed and answered on an 11-point numeric rating scale ranging from 0 (very bad) to 10 (very good). The following characteristics of participants constituted study variables and their categorisation: socio-demographics: age in years (15-24, 25-34, 35-44 and ≥ 45) and parity (primiparous and multiparous). Education was categorised as never attended school, primary school, secondary school and university level. Marital status was categorised as married and cohabiting or separated, widowed or single. The number of people in the household ranged from 1-4, 5-7 and ≥ 8 . Health insurance categories included a group with community-based insurance, public and private and no insurance. The place of childbirth included: health centre, district hospital, referral hospital or private clinic, at home or on the way to the clinic. The mode of delivery spanned from vaginal birth to planned CS or emergency. The complications or problems during childbirth were classified as no complications or complications. The health status one day after childbirth included: very good, good, neither good nor bad, bad and very bad. The age of the baby at the time of interview was grouped into one to six months and seven to 13 months. Lastly, the health status of the newborn one day after birth was assessed using a Likert scale: very good, good, neither good nor bad, bad and very bad.

Variables of perceptions of childbirth used in study I: assessed confidence in the medical skills of the staff, information on experiences during labour and birth, healthcare staff treatment and respect during childbirth, provision of pain relief during childbirth and support from the healthcare providers to start breastfeeding. The variable of having skin-to-skin contact between the baby and the mother had a dichotomous response option, with a "Yes" or "No".

Data analysis: the data were entered by three trained data entry clerks recruited from the database of data entry clerks at the School of Public Health, College of Medicine and Health Sciences at the University of Rwanda, for Studies I, II and III.

Of 921 women who had given birth during the last thirteen months and agreed to participate in Study I, a total of 898 women answered the structured questionnaire, including the questions about the perceived quality of care and overall experience of childbirth. The dichotomous dependent outcome, “overall childbirth experience variable”, was recorded from the eight to 10 numeric rating scale variables, for good experiences; 0 to 7 described bad experiences. Univariate logistic analyses were performed to test the association between each of the independent variables and the dependent variable to find predictors of the childbirth experience. Univariate logistic analysis was used to identify factors that influenced the perceived quality of care and the only significant variables (with p-value < 0.05) in the univariate model were included in the multivariable model. The area under the ROC curve was calculated for a description of the goodness of fit of the model⁹⁰. ROC was interpreted as acceptable: 0.7-0.8, excellent: 0.8-0.9 and > =0.9 outstanding⁹¹.

Spearman’s correlation coefficient (r_s) was used for correlations between the age of the child and statements about the perception of care.

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS version 23, SPSS Inc, Chicago, IL, USA) and version 9 of SAS System for Windows (Cary, NC, USA).

2. Study II

Participants and data collection

Of 921 women who had given birth one to 13 months earlier, one question answered by 898 women asked the women to rate their overall experience of childbirth from 0 (very bad) to 10 (very good). Of these, 28 women (3.1%) rating their childbirth experience as bad (< 4) were eligible for and were contacted for an individual interview. Seventeen women agreed and consented to participate in the qualitative study and were interviewed separately. A phenomenology qualitative research was done using a thoughtful lifeworld approach between August 2014 and March 2015.

The data were collected by the author in individual narrative interviews using in-depth interviews in the women's homes. The interviews were carried out in the Kinyarwanda language by the author in a quiet area, with the assistance of one research assistant who took notes. The interview began with a short introduction; the mother was asked to describe in detail her overall childbirth experience. Receptive to the women's narrative, the interviewer posed clarifying questions such as: "Can you describe in more detail? Can you give an example? Please clarify". The interviews lasted between 36 and 105 minutes, with an average duration of 43 minutes.

Data analyses: the interviews were recorded, transcribed and translated word for word to English by an independent medical doctor, proficient in English and Kinyarwanda. The analysis was carried out and the results were discussed several times among the first and last authors. First, all the interviews were read through to obtain a sense of the whole experience. Later, the responses were read repetitively to obtain the meaning units that answered the research question, the meaning of a poor childbirth experience, were identified and gathered. The following analysis was a continuous slow process of reading and structuring, moving back and forth between parts and the whole, using the research question as "the lens".

A critical reflective approach was used, where the interviewer's own presuppositions were controlled in order to be open to the phenomenon that emerged. Gradually, the essential meaning of the phenomenon and its structure appeared and the text was analysed using a reflective lifeworld approach ⁹².

3. Study III

Participants and data collection: the data collection took place at health facilities in the same area as the household study, between December 2014 and January 2015.



Figure 8. A private hospital selected for data collection, Croix du Sud.

A sample of 817 women was included from 18 health facilities (eight in Kigali and 10 in Northern Province, with a large number of vaginal births (more than 600) in 2013. This calculation was made in collaboration with another sub-study within the MatHeR program, where the estimated prevalence was 14.8% caesarean sections in 2013 and a precision of 5% and 10% non-response. The number of selected participants at each health facility was determined proportionally relative to the number of vaginal births (14). Of 817 women, 435 women with a normal pregnancy and the

spontaneous start of labour, according to criteria, participated in Studies III and IV.

The heads of the selected healthcare facilities contacted the heads of their labour wards, who orally informed women who had given birth about the study. The data were collected before discharge by eight trained data collectors from the participating women. Data were collected from medical records and a self-reported questionnaire. This questionnaire was composed of various variables such as socio-demographic characteristics, including age in years categorised into four categories: 20-24, 25-29, 30-34 and 35-39; *education (in years)*: never attended school, primary level but not completed (fewer than six years), primary level completed (eight years), secondary school but not completed (one to five years), secondary school, completed (six years), university level (all levels) and vocational training; *occupation*: student, unskilled worker (shopkeeper, farmer, agricultural worker), skilled worker (clerk, carpenter, plumber, bus driver), civil servant (teacher, nurse, medical doctor, lawyer, company/business, banking) and no occupation, *marital status* categorised as married and not married, including cohabiting, separated/divorced, widowed and single; *health insurance*: community-based insurance, public and/or private and no health assurance; *parity*: multiparous and primiparous; *household income per month*: less than 17,500 FRW, 17,500-35,999 FRW, 36,000-99,999 FRW, 100,000-199,999 FRW, 200,000-499,999 FRW, more than 500,000 RWF, *number of visits to antenatal care unit*: one visit, two visits, three visits, four visits and more than four visits; *distance from home to the nearest health facility*: ≤ 1 km, 2-5 km, 6-10 km, > 10 km and *transfer to and from another healthcare facility*.

Further variables were related to the *progress of labour and birth*, such as cervical dilation grade at arrival at health facility ≤ 3 cm, 4-5 cm and ≥ 6 cm, cervical dilation four hours after arrival at health facility: ≤ 3 cm, 4-5 cm and ≥ 6 cm and length of labour. *Variables related to practices among primiparous and multiparous women* including interventions such as healthcare provider assisting birth; nurse, midwife, medical doctor, *the following binary "Yes and No"*: pain relief, traditional drugs, amniotomy, fundal pressure, episiotomy, the five variables in the Bologna score questionnaire ³³:

presence of a companion during labour and birth, use of a partogram with a four-hour action line, absence of labour augmentation with oxytocin, non-supine position at birth and skin-to-skin contact between mother and child ≥ 30 min within one hour after birth. *Variables related to outcomes at different levels of health facilities:* mode of delivery: spontaneous vaginal birth, vacuum extraction, emergency caesarean section; newborn baby weight (grams) $< 2,500\text{g}$, $\geq 2,500\text{ g}$; Apgar score at five minutes, under 7 and ≥ 7 ; postpartum haemorrhage $< 500\text{ml}$, $500\text{-}1,000\text{ ml}$, $> 1,000\text{ ml}$; oxytocin 10 IU postpartum to prevent postpartum haemorrhage; overall self-reported health status at discharge: very good, good, neither good nor bad, bad and very bad.

Data analyses: the data were analysed using SPSS 24.0 software. Descriptive statistics were used. Means with standard deviations (SD) and proportions⁹³ for categorical variables. For comparisons between two groups, Fisher's exact test was used for dichotomised categorical data and the Mann-Whitney U test for continuous data. The chi-square test was used to compare healthcare facilities (three groups) for non-ordered categorical variables and the Kruskal-Wallis test was used for continuous/ordered variables.

4. Study IV

Participants and data collection: the two subscales, own capacity and perceived safety from the childbirth experience, were translated into Kinyarwanda. Data were collected by interviewers who were selected and trained for five days. One day of training focused on identifying eligible healthy facilities and other listing procedures, while two days were spent on questionnaire administration and ethical issues. There was then one day of fieldwork for the pre-test of questionnaires and fieldwork procedures and one day of debriefing with feedback after the pre-test fieldwork. The reliability was tested using Cronbach's alpha and Cohen's effect size was used for comparisons of groups known to differ in childbirth experience.

Study IV includes the same socio-demographics as Study III and 14 items: own capacity comprised eight items and perceived safety six items. For 11

items there was a four-point Likert scale, as follows: 1 ('totally disagree'), 2 ('mostly disagree'), 3 ('mostly agree') and 4 ('totally agree')⁹⁴. Three items were rated on numeric scales ranging from 0 to 10. The sense of security 0 ('no security') to 10 ('better security') and experience of labour pain was rated on a numeric rating scale ranging from 0 ('no pain') to 10 ('worst pain'); these scales were also converted to four-point Likert scales as follows: 0-4 = 'totally agree', 5-6 = 'mostly agree', 7-8 = 'mostly disagree' and 9-10 = 'totally disagree'. Subscale scores ranged from 1 to 4, with high scores indicating a good childbirth experience. The negatively worded items were reversed in scoring. A question on overall childbirth experience using a rating scale ranging from 0 ('very bad') to 10 ('very good') was added to the questionnaire.

Data analysis: all analyses were performed using SPSS 24.0 software. Statistics were computed to determine the variable distribution of the sample. Means with standard deviations (SD) were used to describe the continuous quantitative variables and proportions were used for the categorical variables⁹³. To assess the internal consistency of the questionnaire, reliability was tested using Cronbach's alpha and construct validity was assessed by comparing differences of magnitude in scores between groups using Cohen's effect size. Cohen's effect size is interpreted as 0.2 = 'small', 0.5 is described as 'medium' and an effect size of 0.8 is 'grossly perceptible and therefore large'⁹⁵. The Mann-Whitney U test was used to compare mean scale scores between groups.

Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer the Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items on the scale. Cronbach's alpha is determined by a formula based on the number of items considered and r is the mean of the inter-item correlations, the size of alpha is determined by both the number of items on the scale and the mean inter-item correlations. The following interpretation of r : "> 0.9 – excellent, > 0.8 – good, > 0.7 – acceptable, > 0.6 – questionable, > 0.5 – poor and < 0.5 – unacceptable"⁹⁶.

5. ETHICAL CONSIDERATIONS

All four studies were approved by the University of Rwanda, School of Public Health Institutional Review Board in May 2014 (Ref: 010/UR/CMHS/SPH/2014) and the National Institute of Statistics Rwanda (0425/2014/10/NISR). Before data collection, authorisation to conduct the study was obtained from the Ministry of Health in Rwanda (Ref: 20/4029/MCH/2014).

According to Helsinki principles and guidelines ⁹⁷, participation was voluntary for all the women before data collection. In Studies I, II and III, and before the interview, in Study II, detailed oral information was given to the participants about the confidentiality of their responses and their free choice to participate and to withdraw from the study at any time. Written and signed consent were obtained from all the participants. For those who did not know how to read, the enumerators read for them and they signed themselves or made their mark and both the woman and the enumerators kept a copy. For Study II, we used the consent form, which was signed during the data collection for Study I. In addition, verbal authorisation to record the session for the interviews was requested and granted by all the women. If someone had refused, the researchers would have only taken notes, but this never happened. Confidentiality was also maintained by conducting the interviews in private and coding each interview. For participant privacy, before receiving their consent to participate, we had promised not to share the data with anyone outside the research group. As a result of this agreement, the data were deposited with the Swedish National Data Service (SDN) and can be accessed upon request at doi number: 10.5878/002900.

6. RESULTS

The main findings in this thesis are presented in the form of a summary of the results of each study.

6.1 Study I

Of 922 women, 921 (99.9% response rate) participated in Study I and answered the questionnaire in an interview. Of these, 898 women (97.5%) rated their overall experience. The participants' median age was 27 years, with the youngest aged 15 and the oldest 46. More than half (53.1%) were between 24 and 35 years old. The majority of women had attended primary school, but only 25.8% had completed primary education. Thirty-three per cent lived in the Northern Province and 74.7% had community health insurance.

The majority (87.9%) had had a spontaneous vaginal birth, 3.7% a planned caesarean and 8.4% an emergency caesarean section. In the study group, 16.7% had experienced complications or problems during childbirth. About half the children (53%) were aged between one and six months at the time of data collection.

More than three-quarters (77.5%) rated their overall experience between 8 and 10, defined as a good experience in this study. Seven variables with statements about perceptions of care (confidence in staff, receiving enough information, being treated with respect, getting enough pain relief, getting support from staff, getting help to start breastfeeding and having the baby skin to skin after birth) revealed a significant relationship ($p < 0.05$) with the dichotomised outcome variable in univariable analyses.

All the significant predictors from the univariable analyses were entered into a multivariate stepwise logistic regression model to find significant independent predictors of a good overall childbirth experience. Five of seven statements about perceptions of care during labour and birth remained independently significant in the multivariable model; having confidence in staff (adjusted OR 1.73, 95% CI 1.20-2.49), receiving enough

information (adjusted OR 1.44, 95% CI 1.03-2.00), being treated with respect (adjusted OR 1.69, 95% CI 1.18-2.43), getting support from staff (adjusted OR 1.75, 95% CI 1.20-2.56) and having the baby skin to skin after birth (adjusted OR 2.21, 95% CI 1.52-3.19). The area under the ROC curve for the final model was 0.79 (95% CI 0.75-0.82). See details in Table 2.

Table 2. Univariable and multivariable logistic regression of predictive quality care variables against an overall good childbirth experience (as rated 8-10), n=898

Variable	Missing	Value	n (%) of event	Univariable*			Multivariable**		
				OR (95%CI) Good overall experience	p-value	Area under ROC curve (95%CI)	OR (95%CI) Good overall experience	p-value	
Confidence in medical skills	23	Totally disagree	3 (37.5%)						
		Mostly disagree	7 (33.3%)						
		Mostly agree	231 (64.7%)						
		Totally agree	444 (89.2%)	3.84 (2.87-5.16)	<0.0001	0.70 (0.66-0.74)	1.73 (1.20-2.49)	0.0036	
Information during birth	21	Totally disagree	5 (35.7%)						
		Mostly disagree	40 (50.6%)						
		Mostly agree	273 (70.0%)						
		Totally agree	367 (91.1%)	3.09 (2.43-3.94)	<0.0001	0.71 (0.67-0.74)	1.44 (1.03-2.00)	0.0319	
Treated me with respect	21	Totally disagree	4 (20.0%)						
		Mostly disagree	7 (29.2%)						
		Mostly agree	251 (68.2%)						
		Totally agree	423 (89.2%)	3.76 (2.86-4.95)	<0.0001	0.71 (0.67-0.74)	1.69 (1.18-2.43)	0.0046	
Pain relief I needed	21	Totally disagree	17 (54.8%)						
		Mostly disagree	94 (70.7%)						
		Mostly agree	275 (73.1%)						
		Totally agree	299 (86.4%)	1.67 (1.38-2.02)	<0.0001	0.62 (0.58-0.66)			
Support from staff	21	Totally disagree	2 (20.0%)						
		Mostly disagree	13 (35.1%)						
		Mostly agree	302 (70.1%)						
		Totally agree	368 (90.4%)	3.95 (2.94-5.30)	<0.0001	0.70 (0.66-0.74)	1.75 (1.20-2.56)	0.0038	

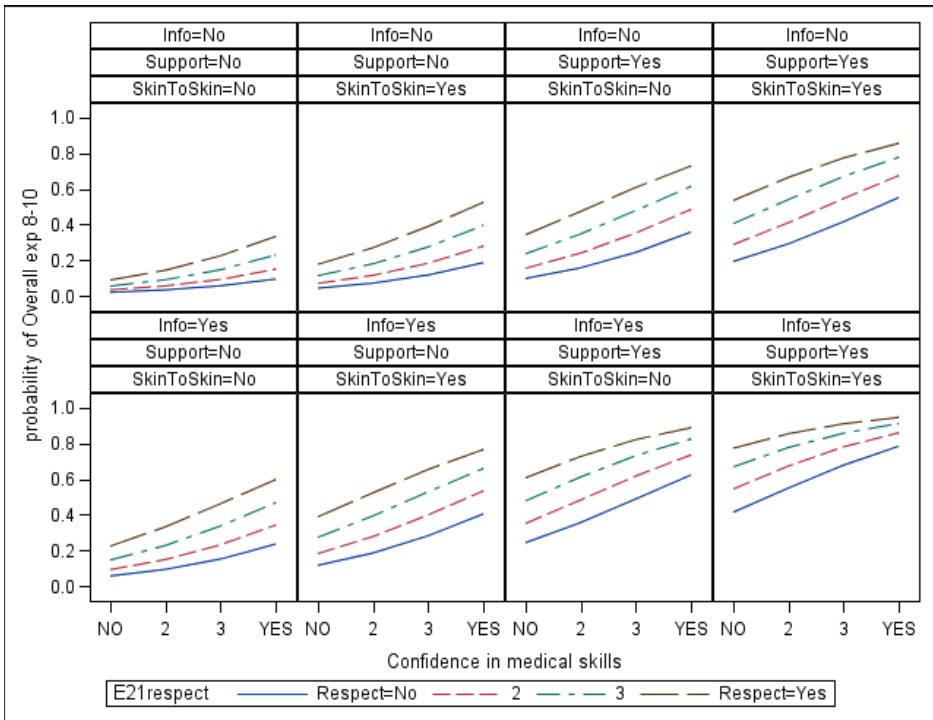
Help to start breastfeeding	20	Totally disagree	118 (73.8%)					
		Mostly disagree	141 (71.2%)					
		Mostly agree	148 (73.6%)					
		Totally agree	277 (85.0%)	1.27 (1.11-1.46)	0.0006	0.58 (0.54-0.62)		
Baby skin to skin	19	No, baby skin to skin	161 (64.9%)					
		Yes, baby skin to skin	524 (82.1%)	2.48 (1.79-3.46)	<0.0001	0.60 (0.56-0.64)	2.21 (1.52-3.19)	<0.0001

P-values, OR and area under the ROC curve are based on original values and not on stratified groups.
OR is the ratio for the odds of an increase in the predictor of one unit.

*) All tests are performed with univariable logistic regression.

***) Multivariable logistic regression model including: confidence in medical skills, information during birth, staff treated me with respect, support from healthcare staff and baby skin to skin. Area under the ROC curve with 95% CI for multivariable model = 0.79 (0.75-0.82).

Figure 9 shows the probability of reporting a good overall childbirth experience (≥ 8 out of 10) in relation to the independent predictors of “confidence in staff, receiving enough information, being treated with respect, getting support from staff and having the baby skin to skin after birth”. The probability of a good experience approaches zero with low ratings on all items and approaches 100% when all the predictors were totally affirmed.



No, 1 ('totally disagree'), 2 ('mostly disagree'), 3 ('mostly agree') and Yes, 4 ('totally agree')

Figure 9. Probability of an overall good childbirth experience (≥ 8 out of 10).

6.2 Study II

Study II explored the meaning of a poor childbirth experience, as expressed by women who had given birth one to 13 months before. Of the twenty-eight women fulfilling the inclusion criteria, seven were excluded

due to an unknown address. As a result, 21 women were contacted, of whom four declined an interview: one, due to the lack of her husband giving his authorisation, another because she was suffering from post-traumatic problems resulting in her child being hospitalised and, lastly, two others who missed the appointment for an interview. Individual interviews were conducted with the remaining 17 women seven to 18 months after birth, with a medium of 11 months.

The analysis of the interview texts revealed that the essential meaning of a poor childbirth experience was “exposure to disrespectful care”, constituted by neglect, verbal and/or physical abuse, insufficient information and the husband being a companion at the woman’s side. The women’s narratives constituted strong evidence of mistreatment and neglectful care. The actions of carers included abandoning, humiliating, disgracing and insulting the women. This created fear for themselves and their child, shame, sorrow, insecurity, distrust and loss of confidence in the healthcare staff, as well as a sense of powerlessness. The absence of a husband as a companion appeared to aggravate the sense of powerlessness. This poor experience had an influence on the women’s choice of health facility for future pregnancies or for other healthcare services. Two women had no poor experience of the care they received. Instead, their low rating was related to medical complications.

6.3 Study II

In this study, 435 women (53.0% of 817) fulfilled the inclusion criteria. They gave birth at three levels of healthcare facilities, their mean age was 27.4 years, 42% were primiparous and 99% had community-based health insurance. Fewer than one third (30.6% at health centres, 31.6% at a district hospital and 29.6% at a referral hospital) had made the mandatory four antenatal visits. See Table 3 for details.

Table 3. Sociodemographic characteristics of participants at different levels of health facilities, n=435

Variable	Health centre (n=125)	District hospital (n=174)	Reference hospital (n=136)
Mother's age			
20-24	48 (38.4%)	50 (28.7%)	39 (28.7%)
25-29	39 (31.2%)	56 (32.2%)	48 (35.3%)
30-34	27 (21.6%)	50 (28.7%)	39 (28.7%)
35-39	11 (8.8%)	18 (10.3%)	10 (7.4%)
Mother's age	26.9 (5.0)	27.8 (4.9)	27.3 (4.5)
Highest level of completed education			
Never attended school	7 (5.6%)	3 (1.7%)	3 (2.2%)
Primary level but not completed (less than 6 years)	52 (41.6%)	53 (30.6%)	20 (14.7%)
Primary level completed (6-8 years)	30 (24.0%)	42 (24.3%)	40 (29.4%)
Secondary school but not completed (1-5 years)	9 (7.2%)	15 (8.7%)	12 (8.8%)
Secondary school, completed	18 (14.4%)	31 (17.9%)	27 (19.9%)
Tertiary, university level	8 (6.4%)	18 (10.4%)	19 (14.0%)
Vocational training	1 (0.8%)	11 (6.4%)	15 (11.0%)
Occupation			
Student	2 (1.6%)	12 (7.1%)	4 (3.2%)
Unskilled worker (shopkeeper, farmer, agricultural worker)	102 (81.6%)	96 (57.1%)	64 (50.8%)
Skilled worker (clerk, carpenter, plumber)	8 (6.4%)	14 (8.3%)	19 (15.1%)
Civil servant (teacher, nurse, medical doctor, law, company/business, banking)	2 (1.6%)	7 (4.2%)	3 (2.4%)
No occupation	8 (6.4%)	28 (16.7%)	29 (23.0%)
Other	3 (2.4%)	11 (6.5%)	7 (5.6%)
Marital status			
Married	57 (46.0%)	85 (49.1%)	47 (34.6%)
Cohabiting	58 (46.8%)	70 (40.5%)	82 (60.3%)
Separated/divorced	0 (0.0%)	2 (1.2%)	1 (0.7%)
Widowed	1 (0.8%)	0 (0.0%)	1 (0.7%)
Not married, single	8 (6.5%)	16 (9.2%)	5 (3.7%)
Health insurance			
Yes, community based	124 (99.2%)	149 (86.1%)	112 (82.4%)
Yes, public (RAMA; MMI, MS, NUR)	1 (0.8%)	17 (9.8%)	21 (15.4%)
Yes, private	0 (0.0%)	1 (0.6%)	1 (0.7%)
No	0 (0.0%)	6 (3.5%)	2 (1.5%)
The total household income per month			
Less than 17,500 FRW	3 (2.4%)	12 (7.1%)	2 (1.7%)
17,500-35,999 FRW	11 (8.9%)	18 (10.7%)	3 (2.5%)
36,000-99,999 FRW	68 (55.3%)	42 (24.9%)	33 (27.3%)
100,000-199,999 FRW	29 (23.6%)	53 (31.4%)	38 (31.4%)
200,000-499,999 FRW	12 (9.8%)	38 (22.5%)	40 (33.1%)
More than 500,000 RWF	0 (0.0%)	6 (3.6%)	5 (4.1%)

Parity			
Primiparous	36 (28.8%)	79 (45.4%)	67 (49.3%)
Multiparous	89 (71.2%)	95 (54.6%)	69 (50.7%)
How many visits did you make to the ANC clinic			
1 visit	11 (8.8%)	6 (3.5%)	11 (8.1%)
2 visits	30 (24.0%)	30 (17.5%)	31 (23.0%)
3 visits	43 (34.4%)	66 (38.6%)	49 (36.3%)
4 visits	38 (30.4%)	54 (31.6%)	40 (29.6%)
More than 4 visits	3 (2.4%)	15 (8.8%)	4 (3.0%)
Distance from home to the nearest healthcare facility			
Up to 1 km	66 (52.8%)	84 (48.6%)	83 (61.0%)
2 to 5 km	37 (29.6%)	68 (39.3%)	44 (32.4%)
6 to 10 km	19 (15.2%)	18 (10.4%)	8 (5.9%)
More than 10 km	3 (2.4%)	3 (1.7%)	1 (0.7%)
Transfer from another healthcare facility	3 (2.4%)	137 (79.2%)	93 (68.9%)

For categorical variables, n (%) is presented. For continuous variables, the mean (SD) is presented.

All the women had received skilled professional assistance. The place of birth was 29.0% at a health centre, 40.0% at a district hospital and 31.0% at a referral hospital. Of all the women, 53.0% had been transferred to another healthcare facility during or before the active start of labour.

Few participants had received pain relief; only 1.8% received pharmacological pain relief and 1.4% non-pharmacological pain relief. Traditional drugs had been taken by 7.2% of the participants, and 14.7% who gave birth at a reference hospital ($p < 0.001$). Amniotomy had been performed in 32.9% of the participants, with dominance in those who had given birth at health centres (39.2%), but the difference was not statistically significant. Episiotomy was performed in 18.6% of the women, with a higher rate in primiparous women (29.7%).

A spontaneous vaginal birth was achieved in 79.9%, with the highest rate (85%) at referral hospitals ($p = 0.13$), while a vacuum extraction was performed in 4.8% of the women at health centres but seldom at other levels ($p = 0.003$). An emergency caesarean section was performed in 6.0% of the women, with the highest rate at the district hospitals (10.9%) and the difference was statistically significant ($p = 0.0004$). Of all the women, 95.8% had a normal blood loss, i.e. ≤ 500 ml, and around three-quarters of the women reported good health status at discharge. Fundal pressure

had been used in 16.6% of the participants; and more often (25.5%) at a district hospital ($p < 0.001$).

Only one woman (0.2%) was accompanied by her husband during birth. A partograph was used for 92.7% of the participants, with the highest rate of 99.2% at the health centres. Eighty-eight per cent of the women had not received oxytocin for the augmentation of labour. Few women (6.2%) gave birth in a non-supine position and only 12.5% of the women had early skin-to-skin contact with their babies within one hour after birth. There were statistically significant differences relating to the level of healthcare facility in four components of the Bologna score, except for the presence of a husband in the birthing room. See Table 4 for details.

Table 4. Practices during labour and birth at different levels of healthcare, n=435

Variable	Total (n=435)	Health centre (n=125)	District hospital (n=174)	Reference hospital (n=136)	p-value
Healthcare provider assisting birth					
Nurse	123 (28.8%)	102 (84.3%)	18 (10.6%)	3 (2.2%)	
Midwife	211 (49.4%)	19 (15.7%)	108 (63.5%)	84 (61.8%)	
Doctor	93 (21.8%)	0 (0.0%)	44 (25.9%)	49 (36.0%)	<.0001
Pharmacological pain relief	8 (1.8%)	2 (1.6%)	5 (2.9%)	1 (0.7%)	0.37
Non-pharmacological pain relief	6 (1.4%)	0 (0.0%)	3 (1.7%)	3 (2.2%)	0.27
Traditional drugs	31 (7.2%)	4 (3.2%)	7 (4.0%)	20 (14.7%)	0.0002
Amniotomy	143 (32.9%)	49 (39.2%)	56 (32.4%)	38 (27.9%)	0.15
Fundal pressure	66 (16.6%)	22 (17.6%)	39 (25.3%)	5 (4.2%)	<.0001
Episiotomy	81 (18.6%)	30 (24.0%)	32 (18.4%)	19 (14.0%)	0.11
Mode of delivery					
Spontaneous vaginal birth	326 (79.9%)	92 (74.8%)	126 (79.7%)	108 (85.0%)	0.13
Vacuum extraction	7 (1.6%)	6 (4.8%)	1 (0.6%)	0 (0.0%)	0.0033
Emergency caesarean section	26 (6.0%)	0 (0.0%)	19 (10.9%)	7 (5.1%)	0.0004
Newborn-baby weight (grams)	3100 (1700; 4800) n=431	3200 (2040; 4200) n=124	3100 (1700; 4800) n=171	3082 (2163; 4000) n=136	0.0021

Newborn-baby weight (grams)					
< 2,500	53 (12.3%)	3 (2.4%)	25 (14.6%)	25 (18.4%)	
≥ 2,500	378 (87.7%)	121 (97.6%)	146 (85.4%)	111 (81.6%)	0.0002
APGAR score at 5 min					
0-6	13 (3.0%)	0 (0.0%)	2 (1.2%)	11 (8.1%)	
≥ 7	420 (97.0%)	125 (100.0%)	170 (98.8%)	125 (91.9%)	0.0001
Postpartum haemorrhage					
No, less than 500 mL	413 (95.8%)	119 (95.2%)	161 (94.7%)	133 (97.8%)	
Yes, 500-1,000 mL	11 (2.6%)	6 (4.8%)	4 (2.4%)	1 (0.7%)	
Yes, exceeding 1,000 mL	7 (1.6%)	0 (0.0%)	5 (2.9%)	2 (1.5%)	0.38
Prevent post-partum bleeding	414 (97.6%)	122 (99.2%)	166 (98.2%)	126 (95.5%)	0.12
Outcomes on the Bologna score items					
Total Bologna score	2.0 (0.70) n=435	2.14 (0.51) n=125	1.79 (0.73) n=174	1.88 (0.63) n=136	<.0001
Presence of a companion during labour and birth	1 (0.2%)	0 (0.0%)	1 (0.6%)	0 (0.0%)	0.47
Use of partograph	369 (92.7%)	117 (99.2%)	151 (91.5%)	101 (87.8%)	0.0029
Absence of labour augmentation	383 (88.0%)	123 (98.4%)	129 (74.1%)	131 (96.3%)	<.0001
Non-supine position	27 (6.2%)	2 (1.6%)	16 (9.2%)	9 (6.6%)	0.026
Skin-to-skin contact between mother and child > 30 min	54 (12.5%)	25 (20.0%)	14 (8.1%)	15 (11.3%)	0.0080
Mother overall self-reported health status at discharge					
Very good	69 (15.9%)	25 (20.0%)	27 (15.5%)	17 (12.5%)	
Good	323 (74.3%)	89 (71.2%)	135 (77.6%)	99 (72.8%)	
Neither good nor bad	28 (6.4%)	9 (7.2%)	10 (5.7%)	9 (6.6%)	
Bad	13 (3.0%)	0 (0.0%)	2 (1.1%)	11 (8.1%)	
Very bad	2 (0.5%)	2 (1.6%)	0 (0.0%)	0 (0.0%)	0.059

For categorical variables, n (%) is presented.

For continuous variables, the mean (SD) is presented.

For comparisons between groups, the chi-square test was used for non-ordered categorical variables, while the Kruskal-Wallis test was used for continuous variables.

6.4 Study IV

Study IV aimed to measure childbirth experience, focusing on women's own capacity and perceived safety when giving birth in healthcare facilities. A total of 817 women (the total population from Study III) who gave birth

in the selected healthcare facilities during the period participated in this study.

The mean age of the participants was 27.8 (\pm 5.6) years and only half the women were officially married (49.8%). Of all the women, 88.7% had health insurance. About half (53.7%) lived less than one km from the nearest healthcare facility. More than 50% of households retained between 36,000 and 99,999 FRW from their reported income every month. More than a third (36.4%) were primiparous and 74.9% had a spontaneous vaginal birth. An emergency and an elective caesarean were reported as the mode of birth for 8.7% and 17.1% respectively and only 1.5% had had an instrumented vaginal birth.

The majority of the women (82.3%) reported a high positive overall childbirth experience score, defined as 8 or more from a maximum score of 10. Internal consistency, measured with Cronbach's alpha, was 0.78 and 0.76 respectively for the own capacity and perceived safety subscales. Construct validity was assessed by comparing the differences in mean scores between groups known to differ in childbirth experience, where multiparous women scored higher than primiparous on the own capacity (2.90 ± 0.60 versus 2.65 ± 0.57) and the perceived safety (3.26 ± 0.53 versus 3.08 ± 0.59) subscales, with small effect sizes (0.43 versus 0.32, $p < 0.001$). Married women scored higher than unmarried women on the own capacity (2.98 ± 0.54 versus 2.57 ± 0.58) and perceived safety subscales (3.35 ± 0.46 versus 3.04 ± 0.60), with moderate effect sizes (0.56 versus 0.58, $p < 0.001$).

7. DISCUSSION

The aim of the studies in this PhD project was to assess the quality of intrapartum care at healthcare facilities offering maternity services in Rwanda by investigating the healthcare management of labour and birth and women's childbirth experiences.

7.1 Predictors of a good childbirth experience (Study I)

In the WHO framework for improving the quality of care for pregnant women during childbirth, experience of care is as important as clinical care provision in achieving the desired person-centred outcomes ¹⁵. The findings in this study revealed a high rate of overall good experience of childbirth related to five significant independent predictors of quality care perceived by women. This included receiving enough information, being treated with respect during birth, having confidence in staff, getting support from staff and putting the baby skin to skin after birth (Study I). Similar findings of a systematic review in low middle-income countries reported that the mothers rated high their satisfaction with care ⁹⁸.

Among socio-demographic predictors of overall good experience, education level was shown to be related. This finding is coherent with earlier research highlighting factors related to women's positive birth experiences, where women have reported having confidence during labour, a greater sense of control, felt more informed about making choices and perceived their labour and birth as less painful ^{93,99}.

Skin-to-skin contact early after birth has positive effects on both mother and baby. These findings showed that skin-to-skin contact with the baby was related to a good overall childbirth experience. Similar results from previous research confirm that keeping mothers and babies skin to skin is a safe and healthy birth practice ¹⁰⁰. It is beneficial to the relationship between mother and baby, facilitates breastfeeding initiation and contributes to maternal well-being ¹⁰¹. Early contact and time spent with babies are also shown to reduce postpartum bleeding and influence

improved uterus involution ¹⁰². Furthermore, maternal stress levels fall ¹⁰³ and optimal thermoregulation in the baby is promoted ¹⁰⁴.

Receiving support from healthcare staff was also a predictor of a good overall childbirth experience. Similar to our results, a study conducted on primiparous women's experiences showed that women felt confident in their first birth and wanted to be confirmed and seen as unique individuals by the professionals. Women also showed their need to have individual support ¹⁰⁵, a Kenyan study on quality of maternity care and its determinants highlighted that the continuum of maternity focus on quality care was important not only to mothers but also their newborns¹⁰⁶

7.2 Disrespectful care – the essential meaning of a poor childbirth experience (Study II)

Respectful care during childbirth is an important part of good quality health care. Since 2014, the WHO has stressed the importance of preventing and eliminating disrespect and abuse during childbirth and replacing it with respectful maternity care ¹⁰⁷. Our study, conducted around the same period, revealed, however, that the meaning of a childbirth experience that was assessed as poor by women who had given birth was disrespectful care, constituted by neglect, verbal and/or physical abuse, insufficient information and refusal to allow the husband to be a companion during labour and birth. Disrespectful care included abandonment and humiliating, disgracing and insulting actions, all of which created a feeling of insecurity, fear and distrust.

These findings echo results from several other studies conducted in African countries. A qualitative study in South Africa, investigating factors associated with negative birth experiences, found that poor-quality intrapartum care led to distress. In this study, a negative interpersonal relationship, lack of information, neglect and abandonment, as well as the absence of a labour companion, were discussed ¹⁰⁸. A qualitative study conducted in Kenya described the mistreatment of women as frustration, with a lack of confidentiality and autonomy, abandonment by the healthcare providers, stigma and discrimination, a poor relationship

between women and healthcare providers and dirty maternity units. Moreover, the same study found that husbands attempted to overcome challenges by paying extra money to healthcare providers to ensure that they looked after their wives ¹⁰⁹. A systematic review on disrespect and abuse of women during childbirth in Nigeria, demonstrated that undignified care in the form of a negative, poor and unfriendly healthcare provider attitudes was the most frequently reported type of abuse, in addition to physical abuse and detention in facilities ⁵⁰, while another systematic review on maternal and childbirth care in Ethiopia reported that the highest prevalence of disrespectful care during childbirth was accounted for by abandonment ¹¹⁰ and a study in Tanzania reported that women who experienced disrespectful/abuse as an important factor in reducing women's confidence in health facilities ¹¹¹.

The finding in our study that the husband was refused the opportunity to be present in the birthing room beside his wife contravenes the WHO recommendation; that women should have the opportunity to have a trustful, supportive companion during childbirth ²⁸. Our finding corroborates previous research in Rwanda and in Nigeria, where the husband was not allowed to be present during labour and the birth of the child ^{112,113}. One study in Nigeria even defined this refusal as a crime against humanity ¹¹⁴. Refusal to allow the husband's presence may be due to the fact that most maternity units in public health facilities in Rwanda have a common birthing room where the beds are only separated by curtains. On the other hand, in antenatal care, it is compulsory that husbands accompany their wives on their first visit during pregnancy ⁵⁸.

Direct observations of maternity health care, in five countries in Eastern and Southern Africa, showed the existence of poor interactions between healthcare providers and the women, which included a lack of information, physical and verbal abuse and abandonment ⁸¹. Another study highlighted the fact that disrespectful care, comprising undignified and humiliating actions, needs to be identified in local contexts ¹¹⁵. A systematic review concluded that the prevailing model of maternity care in this region showed that maternity care was institution centred rather than woman centred ⁴⁹. In a medico-technical care system of this kind, over-

medicalisation is a common practice, with excessive or inappropriate harmful interventions being made, which often fail to take women's needs and values into consideration. Instead, they risk experiencing abusive behaviour, including insulting, punishing words and sometimes physical abuse ²⁸. A landscape analysis in a cross-sectional study in Nigeria has identified seven categories of disrespectful care ¹¹⁶. To conclude, several studies finding disrespectful care have been identified, showing that the need to improve the quality of care in terms of changing it to being respectful is absolutely vital within the African region and, as we found, also in Rwanda. Only one study was found showing contrasting results; this was a study conducted in Tanzania in which women felt prepared and empowered in relation to their childbirth ¹¹⁷.

7.3 Quality of intrapartum care for healthy women with spontaneous onset of labour (Study III)

When it comes to the skills of the person who assisted the woman at birth, all the women were assisted by a healthcare professional. This 100% is remarkable, although only a half were midwives. The statistics is in line with the reported national rate of women assisted by a skilled birth attendant ¹¹⁸.

The pyramidal composition of the Rwandan health system means that a large number of cases are managed at a lower health facility level, while only women with complications are transferred to the next level of health facility (4). The rule issued by the ministry of health is that a normal birth and uncomplicated pregnancy should be managed at health-centre level ¹¹⁹. However, Study III showed that a smaller number of births took place at health centres and a large proportion of women were transferred from a lower health facility level to a district or a referral hospital during or before active labour and also after established labour. Of them, more than a quarter were transferred before active labour. This may be done in order to prevent a delay when there is a risk of complications and a previous Rwandan study has shown that most cases of death were related to delays

in women's referrals from health centres or private clinics to district hospitals or from the district to the tertiary referral hospital ^{9,120}.

The use of pharmacological or non-pharmacological pain relief was infrequent. One of the main explanations could be that the birthing room is common, but cultural beliefs may also be involved. This is similar to the results in a Bangladesh study ¹²¹, and some caregivers and the women themselves may think that a woman should endure natural pain during birth ¹²². Furthermore, a gap in the desire for labour analgesia and its availability has also been identified in a Ugandan study ¹²³. However, some women use traditional drugs during pregnancy and birth, but the reason for this is not explained and further research is needed to explore it.

The mean Bologna score was low and, of five components, only two were good. The first was a high rate of partograph use, which is in agreement with WHO recommendations for the use of the partograph for all women monitoring labour (8). However, we did not explore how the partograph was completed or whether the nurses/midwives sometimes completed the partograph after birth, which do not comply with the importance of monitoring the progress of labour. The second was the low use of labour augmentation with oxytocin. This finding is promising, because the use of oxytocin, in Rwanda nicknamed "Theobald", which may be related to his research on oxytocin ¹²⁴, should be strictly indicated for use with prolonged labour and should not be encouraged in normal labour and birth. A Swedish randomised controlled trial showed that delayed oxytocin use in women with prolonged labour produced no important advantage over early use ¹²⁵.

A meta-analysis of ten randomised controlled trials concluded that the use of a high dose of oxytocin was associated with a reduction in the rate of caesarean sections and shorter duration of labour, without increasing maternal and perinatal adverse outcomes (10). However, this is questioned in a recent Swedish randomised controlled trial showing that use of high-dose oxytocin did not affect the incidence of caesarean section compared to low-dose ¹²⁶, which highlights the importance of restrictive use.

Earlier scientific evidence supports the finding that companions help women to feel self-confident, improve their self-esteem ¹²⁷ and also increase the likelihood of a spontaneous vaginal birth ¹²⁸. A husband or partner as a companion was very rare during labour and birth in our studies. This agrees with findings elsewhere in sub-Saharan Africa, such as in Rwanda, where husbands are denied entry to the delivery room ⁵⁹. In Ghana, the absence of a companion could explain misinterpretations between healthcare providers and women ¹²⁹. Some explanations of why the husband was not allowed in the birthing room were given. For example, a recent qualitative study in a rural area in Rwanda revealed that multiparous women preferred their mothers-in-law to their husbands because mothers-in-law cherish them better and these women also regarded birth as a feminine event. In addition, as sexuality is a part of health for couple ¹³⁰, women feared that their husbands would become less sexually attracted to them, if they saw them giving birth ¹³¹. Furthermore, the facilities are not designed to accommodate husbands or partners.

In Study III, the incidence of a non-supine position during birth was very low, in line with findings from other studies from developing countries. A meta-analysis has indicated that, when using a non-supine position, the women face a reduced risk of instrumented delivery and of episiotomy, but this birth position might also be associated with an increased risk of postpartum haemorrhage and perineal tears. However, most evidence indicates that the difference in benefits and harm between upright and recumbent positions might not be obvious ^{19,132}. In addition, women experience more pain in the supine position and have shown a preference for non-supine positions during birth ¹³³.

Importantly, our study showed a low rate of skin-to-skin contact between mother and baby early after birth. This low rate agrees with other studies in low-income countries, such as Nigeria ¹³⁴. The lack of personnel and time constraints may be barriers to improving skin-to-skin contact at birth, as shown by a qualitative study in India ¹³⁵. Skin-to-skin contact between mother and baby has major advantages ^{100,102,104} and this care routine could be implemented without any cost at all healthcare facilities in Rwanda.

Skin-to-skin contact was found to be one of five factors that were predictors of a positive childbirth experience in Study I, a population-based cross-sectional Rwandan study ¹³⁶. As a result, there is a huge need for this practice in Rwanda to improve health and well-being for mothers and newborns.

Furthermore, Study III showed a low rate of four standard antenatal care visits, which is similar to a recent study of determinants of antenatal visits, which emphasised that the importance of the number and timing of ANC visits should be underlined, particularly among pregnant women and especially among those supporting pregnant women of higher age ¹³⁷. However, this was not in accordance with the WHO's recommendation of a minimum of four antenatal care visits, as an indication of providing good-quality care, as it is a critical time for identifying risk factors for poor maternal and newborn outcomes ¹³⁸. Currently, Rwanda has been chosen by the WHO as one of the pilot sites for implementing eight antenatal care visits. This is an opportunity to sensitise women and stress the importance of the timing and number of ANC visits.

7.4 Women's childbirth experiences emphasising own capacity and perceived safety (Study IV)

Study IV is the first to translate and validate two subscales (own capacity and perceived safety) of the Childbirth Experience Questionnaire ⁹⁴ into the Kinyarwanda language, for use in health facilities in Rwanda. A questionnaire is the most common instrument for assessing satisfaction and experiences ¹³⁹ and one way in which the quality of care from women's experiences and perspectives has been assessed is through the development and application of satisfaction measurements. In this current study, we used 14 items in two subscales in a local context ¹⁴⁰. The Childbirth Experience Questionnaire is a multidimensional construct, like other questionnaires assessing satisfaction with childbirth, with each dimension including various aspects relevant to the childbirth experience

¹⁴¹.

Little previous research focusing on the childbirth experience has been conducted in Rwanda. In Study I, it was shown that more than three-quarters of the women reported a good childbirth experience and that a good experience was associated with confidence in staff, receiving good information, being treated with respect, receiving professional support during childbirth and having skin-to-skin contact with the baby early after birth.

The subscales of own capacity and perceived safety showed good reliability (Cronbach's alpha 0.78 vs. 0.76), but it was somewhat lower than in previous European studies. Multiparous women reported a higher mean score compared with primiparous women. Women who gave birth spontaneously vaginally scored significantly higher than those with an operative birth. These results are in line with previous validation studies in Senegal, Sweden and England^{94,142,143} and these findings are also in line with a qualitative study which revealed that positive experiences were related to previous birth experience¹⁴⁴. Another study added that grand multiparity contributed to the extent of knowledge of childbirth among educated women, intrapartum nurses and childbirth educators working in nursing care, as well as the evolving use of technology to manage intrapartum care in hospitals more effectively¹⁴⁵.

The mean scale scores and standard deviations in the present study were coherent with previous studies^{94,142,146-148}. Furthermore, an Australian study revealed that having a prior good childbirth experience and knowledge of childbirth had a significant effect on childbirth self-efficacy¹⁴⁹. In three Arab countries, it was revealed that a sense of being in control was associated with mothers' satisfaction¹⁵⁰. Feelings of confidence, with its relevance to positive expectations and feeling safe, were confirmed by a respectful welcome and a positive atmosphere in the birthing suite, as reported by women in Sweden¹⁴⁴.

Experiences of fear and pain during childbirth differ between women and could be influenced by cultural, physiological and psychological conditions. Different ratings of pain may be explained by cultural beliefs that women

in labour should stay quiet during labour and birth, even when in severe pain, and not shame themselves and their families. This is also similar to findings from other cultures, such as the Korean culture ¹⁵¹, which is contrary to European culture, where a wide range of reactions toward pain are shown ¹⁵². There is therefore a need to understand and meet the needs of different cultures and offer relevant care. These findings showed that the quality of intrapartum care in Rwanda is less effective. On the one hand, even though most women described their childbirth experience positively, other women expressed their essential meaning of a poor childbirth experience as “disrespectful care” and, in addition, practices of care do not follow the WHO recommendation-based standards. Beneficial practices include the use of a partogram and low oxytocin use in the management of labour and birth.

7.5 Methodological considerations

The strengths include the large samples and the random selection of the study population which make it possible to generalise the study results to the whole population in Rwanda. Moreover, to our knowledge, this is the first study to investigate the quality of intrapartum care in Rwanda by investigating childbirth experiences and assessing how labour and birth were managed. The decision to use a large sample in Study IV was not based on the recommendation to use a sample size ten times the number of observed variables in health measurement instruments⁵². To some degree, the sample size was determined in collaboration with another research project in the MatHeR programme.

When it comes to recall bias, previous studies have shown that women's childbirth experience may change two to five years postpartum^{30,153}. In spite of this, a longitudinal cohort study showed that the women recollected their birth memories clearly five years postpartum¹⁵⁴. Another constraint is that, because data were collected in face-to-face interviews, the women may have been unenthusiastic about expressing negative experiences and their perceptions of the care they received. In addition, in the data collection at health facilities, women may have hesitated to give a low rating because they feared that the healthcare worker providing the childbirth care would be blamed.

The strength of a phenomenological lifeworld study is that it provides a further understanding of what it means to have a poor childbirth experience. Likewise, it is based on a representative sample of Rwandan women who had had a baby within the past one to 13 months. Everyone who rated the childbirth experience as "bad" (4 of 10 points) was invited to participate in this study and 60% of them were interviewed¹³⁶. As a result, the findings relating to the impact of being exposed to disrespectful care could probably be generalised to the study population in our cross-sectional study. Some limitations in our study need to be clarified. The interviews and the transcripts were originally in Kinyarwanda and, in translation, words may lose their special meaning. Another limitation is that

the women could have interpreted the structured question in the questionnaire about overall experience differently. Moreover, the experience of childbirth as “poor” could be under-reported, as definitions of what constitutes a poor childbirth experience could vary significantly and so some women who had a poor experience may not have been perceived. The design of a phenomenological study is suited to exploring the deeper understanding of a complex phenomenon ⁹². Being open and sensitive towards the phenomenon was the strategy we used to take account of the objectivity and validity. Despite little experience of intrapartum care, the bridling concept was considered to manage the researcher’s pre-understanding of the phenomenon. “Bridling” the process of understanding does not mean a belief in setting aside all pre-understanding, as this is not possible. It is a necessary condition for understanding. The idea of “bridling” demands from a researcher a reflective and critical attitude in which one “slows down” the process of understanding in order to see the phenomenon in new ways ¹⁵⁵.

In quantitative studies, the validity of the results is strengthened by the use of a developed protocol validated in other settings by international experts in the intrapartum field ^{32,39}. After we had developed our questionnaire and collected the data for Studies III and IV, the WHO published new standard checklists for intrapartum care ¹³⁸, which could be useful in future studies of the quality of childbirth care. We assess it as a strength that all our data were collected by nurses, midwives and psychologists and that all the data collectors were female, which made the women more comfortable about responding to their questions.

One strength of this study was the almost full participation by all the eligible women, who agreed to participate in the study. In our Study I, we used a random selection from a list of households from the area of the study. The selection of the health facilities in Study III and IV was made in the same area of household data collection (Study I), which was random. In Study I, the women may have had recall bias, but more than half the women had less than six months of recall (since the birth) at the time of the study ¹³⁶.

In the health facilities-based study (Study III), satisfaction with care could be over-reported, as the data were collected before the women were discharged. They could have been afraid to say they had a negative experience because it could have an impact on future pregnancy or during visits for vaccination.

In the qualitative study (Study II), the interviews and transcripts were in the Kinyarwanda language and, even though the translation followed the rules of translation to read the text back and forth, it was not always easy to find the right word from Kinyarwanda to English with the same meaning. Some words may have lost their original meaning in this process.

8. CONCLUSIONS

Rwanda is striving actively towards an optimal high-quality healthcare system. Progress in maternal and child health is being made to achieve MDG 5. This thesis provides a deeper knowledge of different aspects of intrapartum care. To summarise, the current results enhance the evidence that the quality of intrapartum care is less effective in Rwanda, even though there are some positive experiences of practices in childbirth.

The majority of the women in the fourth study reported a positive overall childbirth experience, where the experience of their own capacity and perceived safety in particular is an important indicator of childbirth experience and should be assessed to achieve high-quality care, including a positive childbirth experience. In addition, women's perceptions of childbirth care related to the overall childbirth experience revealed that the independent predictors of a good experience were interlinked and are also useful indicators of care of high quality. The five predictors were trusting the healthcare staff, receiving enough information, being treated with respect, receiving support from staff and having skin-to-skin contact with the baby. It is challenging that women are exposed to disrespectful care related to the behaviour of healthcare providers, "nurses and midwives", as well as their inadequate attitude to caring for a woman with complications.

The results showed that all women with expected normal childbirth were assisted during birth by a skilled health professional, there was high use of the partograph and low use of oxytocin augmentation, in compliance with international standards and recommendations, as well as a high rate of spontaneous vaginal births.

In spite of this, several areas for improving childbirth care were identified, as practices in these areas were not in accordance with evidence-based quality care in women. The use of non-supine positions for birth should be encouraged, but this may require training among healthcare professionals. Healthy newborns should be placed skin to skin with their mothers shortly after birth, including in cases of caesarean section, as this

is a simple, cost-free routine that is beneficial in particular for the baby but also for the mother. Last but not least, health facilities should be adjusted to allow the presence of a woman's choice of companion during labour and birth.

9. FUTURE PERSPECTIVES

It is important to ensure that childbirth care is included in national and clinical guidelines and meets these quality aspects of care in order to further improve intrapartum care in Rwanda. The women's preferences, such as building confidence, providing good information, treating women and families with respect, providing good professional support during childbirth and putting the newborn baby skin to skin with its mother early after birth, should also be considered.

To bridge a gap in respectful care, there is a need to focus on strategies to implement respectful maternity care for all women, especially during the intrapartum period. The barriers preventing healthcare providers behaving respectfully need to be further investigated and education programmes for midwives and nurses on professional behaviour should be implemented.

When it comes to practices and interventions, there are benefits from practices designed to encourage the use of the partograph and a restrictive use of oxytocin augmentation. However, there is a real need to integrate women-centred care by making sure that women will be given continuous support by a husband or some other person of the woman's choice as a companion during labour and birth. It is also important to integrate the use of non-supine positions in childbirth guidelines and improve it in education of midwife and an immediate need to promote skin-to-skin baby-mother contact directly after birth.

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APPENDIX

1. Ethical approval
2. Informed consent form

Appendix I

The UR/CMHS/SPH Institutional Review Board is operating under the Rwanda National Ethics Committee (FWA Assurance No.: 00001973; IRB 00001497 of IORG 0001100)

Ref: 010/UR/CMHS/SPH/2014
Date: 18th May 2014

To:
The Co-Principal Investigators:
Dr. Semasaka Sengoma,
Judith Mukamurigo,
Regis Hitimana,
Dr. Akashi Andrew.

Re: Ethical Approval

Study Title: *Maternal and child health care in Rwanda: Quality and utilization of antenatal care and delivery services, pregnancy complications and their impact on health and family situation, with cost-effectiveness analyses.*

This study has been evaluated by members of the UR/CMHS/School of Public Health Institutional Review Board (IRB).

No.	Name	Institute	Involved in the Decision		
			Yes	No (Reason)	
				Absent	Withdrawn from Process
1	Dr. Jeanine CONDO	School of Public Health - CHAIRPERSON	X		
2	Prof. Jean Baptiste Kakoma	Full Professor, School of Public Health		X	
3	Prof. Cyprien MUNYAHSONGORE	Associate Professor, School of Public Health	X		
4	Dr. Aline UMUBYEYI	Lecturer, School of Public Health - SECERTARY		X	
5	Prof. Joseph NTAGANIRA	Associate Professor, School of Public Health		X	
6	Dr. Laetitia NYIRANZINYOYE	Lecturer, School of Public Health	X		
7	Dr. Manasse Nzayirambaho	Lecturer, School of Public Health	X		

8	Dr. James HUMUZA	Lecturer, School of Public Health		X	
9	Sis. MALIBOLI Marie-Josee	Health Educator & Promotion - Trac-Plus		X	
10	Dr. MUDENGE Charles	Psychiatrist, Psychosocial Consultations Service (SCPS) & Part time lecturer, NUR Faculty of Medicine	X		
11	RUZINDANA Landrine -	Legal Officer, Kicukiro District Offices		X	

After evaluating the above mentioned protocol during the UR/CMHS/SPH Institutional Review Board Meeting of 14th May 2014, where quorum was met, the following comments were made:

Comments/ Questions:

1. What considerations have you made to factor in women who have been sexually abused that you might encounter in your study? Is it well documented? What procedures/ measures will be undertaken?
2. You have used one Sample size calculation formula for all the sub-studies? What is the rationale?
3. Did you consider calculating the sample size with the rarest disease/health condition?
4. Where do you base the 20% non-response rate for the sample size estimation?
5. Suppose one of your respondents is underage (below 21) but legally married, how will you handle ethical issues that may arise?
6. What is your design effect?
7. Why have you selected the Northern Province of Kigali? How will this influence the external validity of your study?
8. Ensure you detail in the text of your protocol the particular sections of the WHO Ethical considerations that you will apply to your study.
9. Submit a consent form that follows the WHO template. (both in English and Kinyarwanda)
Submit questionnaire (English and Kinyarwanda)
10. For the Intra-partum care quality in low risk pregnancies: Ensure you present your Research question as a question.
11. Will you compare participants between those residing in rural and in urban areas? Why or Why not?
12. For the Pregnancy related complications Section: prevalence, health economic impact, and family experiences; What complications are you considering? And Why?
13. At PhD level there is need to justify the type of methodology you shall use, and show knowledge of other methods used as found in literature review?
14. Make sure you have referenced the article on Abortion Complications correctly.
15. For the section on Cost Effectiveness of Maternal health Interventions: Which ANC visits are you focusing on?
16. Why are you not focusing on the quality of ANC visit? This information would be very important to the MCH department.
17. You will need to an ethics section
18. Highlight the added value of your study in relation to Literature review

DECISION:

Having satisfactorily responded to, and readjusted your protocol according to the comments and questions, the committee is satisfied that your protocol meets ethical standards and hereby gives ethical APPROVAL for your study.

Sincerely,

Dr. CONDO Jeanine MD, MSc, PHD
Chairperson,
UR/CMHS/SPH Institutional Review Board

CC: - The Director of Research - NUR
- The Chairperson - Rwanda National Ethics Committee
- The Director, UR/CMHS/SPH

A handwritten signature in blue ink, appearing to be 'Jeanine Condo', is written over a horizontal line.

Appendix II

**UNIVERSITY OF RWANDA
COLLEGE OF MEDICINE AND HEALTH SCIENCES/SCHOOL OF PUBLIC HEALTH**

This informed assent form is for children between the ages of 16 - 18 who have a child aged between one and 13 month and who we are inviting to participate in research on *Maternal and Child health care in Rwanda: Quality and utilization of antenatal care and delivery services, pregnancy complications and their impact on health and family situation, with cost-effectiveness analyses.*

Name of Principle Investigator: RURANGIRWA AKASHI Andrew, Judith MUKAMURIGO, Jean Paul SEMASAKA, Regis HITIMANA

Name of Organization: University of Rwanda/College of Medicine and Health Sciences/School of Public Health

Name of Sponsor: University of Rwanda and Swedish International development agency

Name of Project: Maternal and Child health care in Rwanda: Quality and utilization of antenatal care and delivery services, pregnancy complications and their impact on health and family situation, with cost-effectiveness analyses.

This Informed Assent Form has two parts:

- **Information Sheet (gives you information about the study)**
- **Certificate of Assent (this is where you sign if you agree to participate)**

You will be given a copy of the full Informed Assent Form

Part I: Information Sheet

Introduction

My name isand my job is to research on Maternal and Child health care in Rwanda: Quality and utilization of antenatal care and delivery services, pregnancy complications and their impact on health and family situation, with cost-effectiveness analyses.

We want to know your experience during pregnancy, delivery, and after delivery related to your last-born. We think that the results will help to formulate policies related to maternal health care in Rwanda.

I am going to give you information and invite you to be part of a research study. You can choose whether or not you want to participate. We have discussed this research with your parent(s)/guardian and they know that we are also asking you for your agreement. If you are going to participate in the research, your parent(s)/guardian also have to agree. But if you do not wish to take part in the research, you do not have to, even if your parents have agreed.

You may discuss anything in this form with your parents or friends or anyone else you feel comfortable talking to. You can decide whether to participate or not after you have talked it over. You do not have to decide immediately.

There may be some words you don't understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime and I will take time to explain).

Purpose:

We want to understand your maternal health experiences and socioeconomic impact of maternal experience to inform policy makers on appropriate policy measures for improving quality and utilisation of those services.

Choice of participants:

You have been chosen randomly among women who leave in Kigali city and Northern province and who have children between 1 and 13 months.

Participation is voluntary:

You don't have to be in this research if you don't want to be. It's up to you. If you decide not to be in the research, it's okay and nothing changes. Even if you say "yes" now, you can change your mind later and it's still okay.

Procedures:

We are going to ask you questions related to your maternal and child bearing experience. It will take between 2 and 4 hours.

Risks

We are asking you to share with us some very personal and confidential information, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question or take part in the survey if you don't wish to do so, and that is also fine. You do not have to give us any reason for not responding to any question, or for refusing to take part in the interview

Benefits

There will be no direct benefit to you, but your participation is likely to help us find out more about how to improve maternal health services in Rwanda.

Reimbursements

You will not be provided any incentive to take part in the research.

Confidentiality:

We will not tell other people that you are in this research and we won't share information about you to anyone who does not work in the research study.

Information about you that will be collected from the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key.

Right to Refuse or Withdraw: Can I choose not to be in the research? Can I change my mind?

You do not have to be in this research. No one will be mad or disappointed with you if you say no. It's your choice. You can think about it and tell us later if you want. You can say "yes" now and change your mind later and it will still be okay

Who to Contact:

You can ask me questions now or later. I have written a number and address where you can reach us. If you want to talk to someone else that you know like your teacher or doctor or auntie, that's okay too.

If you choose to be part of this research, I will also give you a copy of this paper to keep for yourself. You can ask your parents to look after it if you want.

You can ask me any more questions about any part of the research study, if you wish to. Do you have any questions?

PART 2: Certificate of Assent

I understand the research is about understanding my maternal health experiences and socioeconomic impact of maternal experience. I understand that I will respond to questions I am asked by the researcher.

I have read this information (or had the information read to me) I have had my questions answered and know that I can ask questions later if I have them.

I agree to take part in the research.

OR

I do not wish to take part in the research and I have not signed the assent below.
_____ (initialled by child/minor)

Only if child assents:

Print name of child _____

Signature of child: _____

Date: _____
day/month/year

If illiterate:

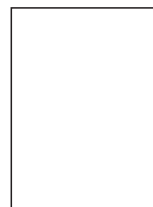
A literate witness must sign (if possible, this person should be selected by the participant, not be a parent, and should have no connection to the research team). Participants who are illiterate should include their thumb print as well.

I have witnessed the accurate reading of the assent form to the child, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Print name of witness (not a parent) _____ **AND Thumb print of participant**

Signature of witness _____

Date _____
Day/month/year



I have accurately read or witnessed the accurate reading of the assent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given assent freely.

Print name of researcher _____

Signature of researcher _____

Date _____
Day/month/year

Statement by the researcher/person taking consent

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the child understands that she will responds to questions asked by the researcher.

I confirm that the child was given an opportunity to ask questions about the study, and all the questions asked by him/her have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this assent form has been provided to the participant.

Print Name of Researcher/person taking the assent _____

Signature of Researcher /person taking the assent _____

Date _____
Day/month/year

Copy provided to the participant _____ **(initialed by researcher/assistant)**

Parent/Guardian has signed an informed consent ___Yes ___No ___**(initialed by researcher/assistant)**

