UNIVERSITY of RWANDA

PREVALENCE AND RISK FACTORS ASSOCIATED WITH PRETERM BIRTH AT NYAMATA DISTRICT HOSPITAL: JULY-AUGUST 2019

IMMACULEE MUKANDEPANDASI

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A dissertation submitted in partial fulfilment of the requirements for the degree of MASTER'S OF PUBLIC HEALTH

University of Rwanda College of Medicine and Health Sciences

By

Immaculee MUKANDEPANDASI

215042777

Supervisor: Dr. Jean Paul S SEMASAKA

Co-Supervisor: Dr. Sabine F MUSANGE

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DEDICATION

This dissertation is dedicated to my Family. In all humility, this dedication is my humble recognition for your importance to me and my destiny.

God’s Blessings to you

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Firstly, I would like to express my sincere gratitude to my ALMIGHTY GOD. This work would not have been accomplished without the provision and grace of the Almighty God. To Him be the glory and honor, now and forever.

I sincerely thank my parents for the sacrifices they have made all through my life to come up to this far. I am forever grateful for their love and support

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ABSTRACT

Background: Preterm birth, defined as childbirth occurring at less than 37 completed weeks or 259 days of gestation from the first day of the last menstrual period, is the major determinant of neonatal mortality and morbidity worldwide and remains a public health concern. Of the estimated 3 million neonatal deaths occurring globally each year, about 1 million are directly related to prematurity. No studies have been carried out locally to determine the prevalence of as well as factors associated with preterm delivery in Rwanda. This study aimed to determine the prevalence and risk factors associated with preterm birth among women admitted in the delivery service at Nyamata District Hospital located in Bugesera District in Rwanda.

Methods: This was a health facility-based cross-sectional study that used data that were collected in July-August 2019 through structured interviews and medical records. A total of 400 women were enrolled into the study at Nyamata District Hospital. Study participants' socio-demographic, psychological and medical characteristics are described using frequencies and prevalence. Bivariable and multivariable logistic regression models were performed to determine factors associated with pre-term birth using SPSS version 21.

Results: The prevalence of preterm birth in Nyamata Hospital was found to be at 9%. Most of respondents 78.8 % were aged between 20 to 35 years. Almost a quarter of respondents had a Body Mass index between below 18.5 and a quarter had Mid-Upper Arm Circumference below 24cm. Weight gain during pregnancy (OR: 3.89, CI: 1.10–13.77), MUAC below 24cm (OR: 5.85, 1.26-27.24), interpregnancy interval (OR: 7.60, CI: 1.10–52.43), and stress (high level) during pregnancy (OR: 7.68, CI:1.37–42.92) , were independently risk factors of preterm birth in Nyamata district hospital. Health insurance (OR: 0.27; CI: 0.08-0.83) have an independent protective effect. Moreover, marital status, level of education, smoking during pregnancy, alcohol use during pregnancy, multiple pregnancy, attending antenatal visit and pregnancy induced hypertension were not found to be risk factors of preterm birth.

Conclusion: The prevalence of preterm birth in Nyamata Hospital find to be high compare to Rwanda ambition o reaching SDGs. Different risk factors like, interpregnancy interval, stress during pregnancy and MUAC below 24cm were associated with preterm birth. All women at risk should receive special care during pregnancy and designed interventions such as dedicated preterm birth prevention clinics, preconception care package and antenatal care package including nutrition are suggested in order to prevent preterm birth.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANC -Antenatal Care

APH -Antepartum Hemorrhage

BMI -Body Mass Index

CI -Confidence Interval

CS -Cesarean Section

FANC-Focused Antenatal Care

GA: Gestation Age

LMP -Last Menstrual Period

LMICs: Low-and middle income countries

LICs: low-income countries

MDG: Millennium Development Goal

MOH -Ministry of Health

MUAC -Mid upper arm circumference

OR - Odds Ratio

PROM –Pre-labour Rupture of Membranes

PPROM- pre-labor premature rupture of membranes

PPFP-Post Partum Family Planning

SDGs- Sustainable Development Goals

SVD -Spontaneous Vertex Delivery

UTI- Urinary tract infection

WHO- World health organization

CHAPTER ONE

1.1 BACKGROUND

Preterm birth is defined as childbirth happening before 37 completed weeks or 259 days of gestation from the first day of the last menstrual period (1). Preterm birth is the major determinant of neonatal mortality and morbidity worldwide (2,3). Preterm birth remains a public health concern as it continues to be highly prevalent worldwide. More than 15 million babies are born prematurely every year and this number continue to increase (4). World Health Organization (WHO) estimated global rates of 11.1% equivalent to 14.9 million premature babies among 135 million live births worldwide(5).

Prematurity itself links to the higher rate of mortality at an early age as well as morbidity which has long-term adverse consequences to the health of the babies and their families and then affects the countries and World's economic status(5). Worldwide preterm complications cause death count more than 1 million babies each year (3). Preterm birth-related complications are known to be the first foremost direct cause of neonatal deaths, accountable of the 3.1million deaths (35%) a year globally, and the second cause of under five deaths (5). Preterm birth ranges between 5% to 18% worldwide (1).

This devasted health concern is highly prevalent in Low-and Middle Income Countries (LMICs). Prevalence and incidence of preterm births vary according to nation's capacity to manage or intervene on the problem (6). In low-income countries (LICs) prematurity counts for(11.8%), while in lower-middle income countries counts for (11.3%), upper middle- income countries count for(9.4%) followed lastly by high-income countries count (9.3%) (7). Furthermore great number of 60% of preterm birth occurred in sub-Saharan Africa and south Asia with 9.1 million births yearly representing (12.8%) of preterm birth. This expressed the severity of the prevalence of prematurity globally particularly in low-and-middle income countries (4).

In Rwanda 35,000 babies are reported to be premature among 363,000 lives birth every year with 2,600 death due to preterm complications among under-5 children (8). The previous studies confirmed the remarkable decrease of child mortality due to the fact that Rwanda has achieved the target of Millennium Development Goal 4 (MDG4) that aimed at reducing under-5 years mortality rate by 2/3 between1990 and 2015 (9).

In Rwanda from 2005 to 2015 child mortality was reduced significantly from 152 deaths per 1,000 live births up to 50 deaths per 1,000 live births. However, neonatal mortality reduction was not as fast and was reduced from 37 per 1,000 lives birth in 2005 to 20 deaths per1,000 live birth in 2015(10)(11).

The Ministry of Health of Rwanda estimated that neonatal deaths continue to present the biggest challenges, with 68% of all under-five deaths occurring as a result of neonatal complications (12). It was noticed that the declines in neonatal mortality have been more modest than declines in under-five and infant mortality, thus further investments in neonatal and antenatal care are required (5). Despite these, no recent study conducted among women who delivered for assessing the prevalence and risk of the preterm birth in Rwanda. There is a need to provide recent data on the prevalence and risk factors associated with the prematurity and to provide recommendations for further intervention to reach the Rwanda projection of reducing 8% of neonatal mortality rate by 2030(11).This study aims at determining the prevalence and risk factors associated with preterm birth at Nyamata Hospital of Rwanda in 2019. The results are likely to be a basis of information for health professionals and the public about preterm birth prevalence and risk factors in the study area, in order to inform prevention and further interventions related to preterm birth in Rwanda.

1.2. Problem statement

Preterm birth remains the Public health issue that has multiple harmful effects on the nations, societies, and families. Low and middle-income countries are most affected by the problem (2). WHO reports show the range of premature birth in 184 which ranges between 5 to 18%.Although significant progress has been made in reducing premature birth through the implementation of various programs taken for promoting maternal and child health nationwide, few scientific studies conducted in Rwanda on preterm births were traced. There is a need to provide recent data on the prevalence and risk factors associated with prematurity and to provide recommendations for further intervention. The study aims at determining the prevalence and associated risk factors with preterm birth among women who gave birth from July 19th to 19th August 2019 at Nyamata district hospital.

1.3. The aim of the study

The aim of this study was to determine the prevalence and risk factors associated with preterm birth among women who gave birth at Nyamata District Hospital located in Bugesera District from the 19th of July to 19th of August 2019.

1.4. Research objectives

1.4.1. Main objective

The overall objective of this study is to determine the prevalence and risk factors associated with preterm birth among women admitted in the delivery services of Nyamata District Hospital located in Bugesera District from 19th of July to 19th of August 2019.

1.4.2. Specific objectives

- To determine the prevalence of preterm birth among women attending deliveries services at Nyamata District Hospital;
- To determine the association between socio demographic, medical, obstetrical conditions and preterm birth among the women admitted for maternal delivery at Nyamata district hospital

1.4.3. Research questions

- What is the prevalence of preterm birth among women attending deliveries services at Nyamata District Hospital?
- What is the association between socio demographic, medical obstetrical conditions and preterm birth among the women admitted for maternal delivery at Nyamata district hospital?

1.5. Significance of the study

The results of the current study will help to bring new knowledge about pre-term birth in Rwanda. The recommendations will be provided to health providers and policymakers for providing appropriate and effective health interventions aiming to reduce the burden of preterm birth and its devasted effects on the country, society, and family.

The results will inform further studies and the health planners will develop healthy and adequate intervention in reduction and regularization of the problem.

1.6. Operational definitions of key terms

- **Preterm birth:** All births before 37 completed weeks of gestation or fewer than 259 days since the first day of a woman's last menstrual period.
- **Gestational age:** The post-conceptional age of the baby based on menstrual dates calculated using the obstetric wheel.
- **Obstetric wheel:** A standard tool used to simplify calculation of gestation based on the Last Menstrual Period (LMP).
- **Low Birth Weight:** Birth weight less than 2500 grams
- **Parity:** The total number of times a woman has been delivered either term or preterm regardless of the outcome.
- **Spontaneous preterm birth:** Spontaneous onset of labour occurring before 37 completed weeks of gestation.
- **Induced preterm birth:** Induction of labour or elective Caesarean section before 37 completed weeks of gestation.

CHAPITER TWO

LITERATURE REVIEW

2.1. Introduction

Preterm birth is defined by WHO (2015) as all births occurring before 37 weeks of gestation or fewer than 259 days since the first day of a woman's last menstrual period exclude birth before 28 weeks of gestation(2). Different studies indicated that preterm birth can be sub-divided as late preterm delivery (34 to 36 weeks of gestation) accounting for 60-70% of all premature babies, moderate preterm (32 to 33 weeks) accounting for20%, very preterm (28 to 31 weeks) count15%, and extremely preterm (less than 28weeks) for about 5% of all premature babies (2,7). In the USA alone, more than half a million preterm births occur each year(13). The United States is one of three countries with the highest number of preterm births per year. Of 3, 953,591 infants born in 2011 in the United States, 11.72% were premature.

2.2 Causes and risk factors

Preterm birth is a condition with a multiplicity of causes and risk factors .According to Mahapura et al grouped preterm birth into two broad subtypes:"spontaneous preterm birth defined as spontaneous onset of labour or following pre-labour premature rupture of membranes (PPROM) and Induced preterm birth, defined as induction of labour or elective caesarean birth before 37 completed weeks of gestation for maternal or foetal indications" (14). Astudy done by Blencowe et al reported that" in more than 0.5 million birth (42%) occurring in the USA one of the nine infants was born preterm (11.9%) as a result of spontaneous labour and maternal indications; Spontaneous preterm birth is considered to be initiated by multiple mechanisms including infections, uteroplacental ischemia or haemorrhage and uterine over distension" (5). Prior studies revealed that preterm birth had risk factors including multiple pregnancies, maternal age , parity, interpregnancy interval, ANC attendance, maternal nutritional, ante partum haemorrhage, maternal infections and pre-existing conditions such as diabetes, cardiopathy among the women attended delivery services (3,6).To explain causes and risk factors prior to preterm birth socio demographic and obstetrical factors need to be identified to assist in initiation of risk specific interventions (16)(15)(17).

2.2.1 Maternal sociodemographic factors

Different studies reported socio-demographic factors preceding to cause or to increase risks of preterm birth such as advanced maternal age, low level of education, low socioeconomic status , occupation, single marital status, nutritional status, smoking and alcohol use (18)(14)(19). The study conducted in Iran found that the prevalence of preterm delivery in women aged 35 years and above was considerably elevated (6).Numerous studies analyzed the association between preterm deliveries and advancing maternal age, as a study done in Chine underline that" advanced maternal age to be a significant risk of preterm birth" (20).

A study in Lombok, Indonesia, found the results showed that" women with high school education had less risk of having a preterm birth, compared with women with no primary education while maternal age was not significantly associated with preterm birth. In the same study, maternal MUAC <23.5cm was significantly associated with preterm birth adverse pregnancy outcomes such as low birth weight" (17,21).The previous study shows similar findings compare to the findings of a study in Malawi, regarding nutritional status of pregnant women where shows that "poor maternal nutritional and maternal anaemia was associated with preterm birth and intrauterine growth restriction" (18). Wherever study done in Iran found different where 62 % of mothers with preterm pregnancy had haemoglobin lower than 11 were not statistically significant and did not prove recommendation of getting weight in rational of avoidance of preterm birth (17). The study conducted in Rwanda established that" maternal age, level of education, smoking and alcohol use in pregnancy and UTI were associated with preterm low birth but not significant" (22).

2.2.2 Obstetric Risk Factors

Numerous obstetric factors are found to link with preterm birth, and comprise of PROM, previous preterm birth, ANC attendance, parity, Ante-partum haemorrhage, interpregnancy interval, anaemia in pregnancy, UTI and HIV infection (23). A study in India found that previous history of preterm delivery and repeated maternal UTI were associated with preterm birth, whereas antepartum haemorrhage were not. In this study, 36.8% of cases were idiopathic (19). In addition, the study done in Indonesia showed that PROM happens in 2%of pregnancy and contribute to 40%-50% of preterm labour incidence, PROM with spontaneous preterm labor

contributes to approximately 75% of all preterm labor cases (24). Furthermore, Rwanda report from every preemie scale 2015 showed that 8% of birth interval<24months was preterm birth (8). Moreover, preterm birth was associated with maternal UTI (25). It was demonstrated that pregnant women who received <4 times antenatal care were 1.865 times greater chance to experience premature birth compared to patients received antenatal ≥4 times (14,23).

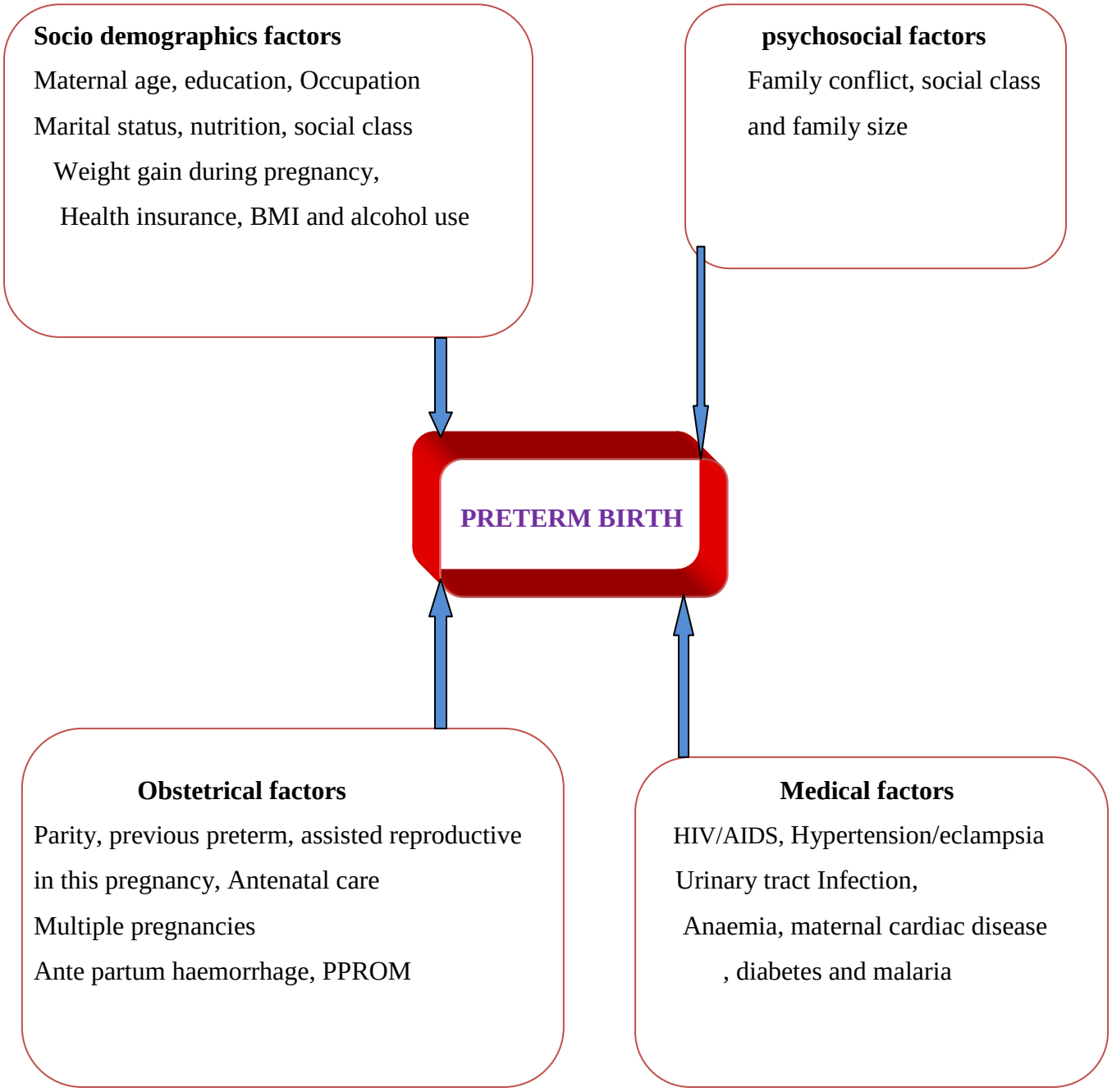
2.2.3 Factors associated with severe prematurity

A small number of published studies have shown that" certain factors associated with preterm birth were more strongly associated with early/severe prematurity. A study in Malawi showed that maternal undernourishment and anemia were independently associated with early preterm birth, also previous preterm birth, PROM, advanced maternal age and being unmarried were associated with early preterm delivery" (18).

2.2.4 Conceptual Framework

As shown in the conceptual model the four concepts of the study, maternal physiologic risk factors, maternal socio-demographic risk factors, infant physiologic risk factors, and socio-demographic risk factors, are related in various ways. Socio-demographic characteristics, a study demonstrates that poor knowledge of caring pregnancy was linked to many complications include preterm birth (13). Education is important as it gives essential information that can modify health behaviour (10)(26). The level of mother's education is predictor of helpful care during pregnancy. Also social class have linked to other factors to cause preterm birth such as weight gain during pregnancies, other nutritional determinant(BMI,MUAC, Haemoglobin level) and behaviour factors (alcohol use, smoking)(16) .The medical complications are discussed to be the risk factors of preterm birth among the women during the delivery services such as hypertensive disorder, pre eclampsia/eclampsia, and repeated malaria episode during pregnancy as well as urinary tract infection, HIV/AIDS and other chronical disease like diabetes and Asthma(18). Indeed, some obstetrical conditions are more likely to be risk factors of preterm birth; among us we may find multiple pregnancy, antepartum haemorrhage, parity, interpregnancy interval and history of PPROM(17).

Figure 1. Conceptual framework



Source: Author

CHAPTER THREE

METHODOLOGY

3.1. Study design

This was a hospital based quantitative cross-sectional study.

3.2. Study Area

The study was conducted at Nyamata district hospital in Bugesera district in Eastern Province of Rwanda. The hospital functions as District hospital serving 15 health centers and one prison. It is located in Nyamata city cell, Nyamata Sector, Bugesera District, about 38.5 km from Kigali city (27). The hospital has maternity unit records more than 500 deliveries every month. Nyamata District hospital is the only hospital that serves a District with a Population density of 282 people per Km^2 and; Nyamata Hospital admit and manage many high-risk pregnancies whose outcomes include preterm birth. This setting provided a good display place to study factors associated with preterm birth.

3.3 Study population

The study included all women who delivered at Nyamata hospital with either living babies or dead babies.

3.4 Eligibility criteria

3.4. 1 Inclusion criteria

The inclusion criteria applied to all women who, regardless of the mode of delivery, had delivered at Nyamata hospital during the study period and who had either living or dead babies, term or preterm

3.4. 2 Exclusion criteria

All women who did not deliver at Nyamata hospital and those who denied giving their consent to participate in this study.

3.4.3 Sample calculation

The sample size was calculated using the prevalence of 50%, 95% confidence intervals and 5% significance levels(28).

The formula below was performed for finding the sample size:

$$\boldsymbol{n_0 = \frac{z^2 xp(1-p)}{d^2} = \frac{(1.96)^2 x0.5(1-0.5)}{(0.05)^2} = 384 \text{ Women}}$$

"z" stands for the level of significance (95%),

"d" for tolerable error (5%), n the minimum sample size

"p" for the current prevalence (50%).

Therefore, a total of 400 women were reached and accepted to participate in the study.

3.5. Sampling procedure and recruitment of participants

This study used 2 data collectors that participated in the recruitment process of participants which was done on a daily basis at discharge time. These 2 data collectors were selected from a group of clinician midwives in maternity and mentor health nurses trained on data collection. Data collectors were supervised by the principal investigator. The principal investigator ensured daily entry and back up of collected data using the birth registers, all mothers who had delivered in Nyamata Hospital were identified. Any women meeting the inclusion criteria were approached by data collectors, informed about the research and its purpose and requested to participate by giving her consent. Those who gave their informed consent were recruited into the study. Administration of the questionnaire was done and the mother's height, weight and left MUAC measured.

3.5.1 Study Instruments

Structure questionnaire were used to capture information, and additional information such as presence of obstetrical complications, "ubudehe" categories, health insurance and antenatal history was tracked from mother's medical files and /or antenatal record cards.

3.5.2 Sampling method

It was a consecutive sampling method. All available delivered women at the time of data collection were recruited as subjects for the study to complete the study population

3.6 Measure (main variables)

3.6.1 Outcome variable

The study outcome variable is "preterm birth" which were collected like a continuous variable as gestation age <37 weeks vs. gestation age 37 weeks and above, and further in the analysis this was grouped as Preterm birth Yes or No.

3.6.2 Maternal Nutritional Status

Maternal nutritional status was assessed by measuring the left middle upper arm circumference (MUAC) using MUAC tapes. MUAC is a good screening tool and is a proxy indicator of pregnancy nutritional status since it does not change much during pregnancy. It is also easy to perform. The majority of screening programs have used a range of 21-23cm to report undernourished. A MUAC of <24cm was chosen for this study. Also, for nutritional status assessment height and weight was measured to find BMI of women, as well as hemoglobin level results, were tracked from the file as many admitted women checked for hemoglobin level.

3.6.3 Maternal social economic and stress scale

Maternal social-economic status and stress scale was measured by asking formulated question from structured questionnaire as main instrument in the study. Stress score were categorized in data analysis, where every question had number equal to number of scores for each items and categorized as follow; 0-4 (no stress),4-8 (less stress), 8-12 (Stress) and 12-20 (high stress level). Regarding to maternal socio-economic status during data collection education was continuous variable and during analysis grouped into 4 categories, also marital status were grouped into 5categories ,single, married, cohabitating separated and widower but in analysis pooled into binary where single combine single/separated and widower and Married with cohabitating.

3.7 Ethical consideration

Before data collection, permission was sought from the University of Rwanda, College of Medicine and Health Sciences Remera Campus, School of Public Health, Institutional Review Board (IRB)(Ref:No354/CMHSIRB/2019, and from ethical committee of Nyamata District Hospital.Before data collection researchers were obtained consent from women . The women had right to take part in the study freely and this was valued at all times during the study. Women were informed about their right to decide whether to take part in the study or not, even take out from the study at any time they want without negative effect to quality of care they and their babies would receive. No inducements were given to participants to remain in the study. We ensure maintained confidentiality at all times as no identification data was recorded (name and ID), and we ensure all information provided was used for research purposes only. No dangerous procedures carried out on the participants, no physical risks were encountered, even psychological risk was managed as in research assistant include mental health nurses. The researchers were ensured confidentiality.

3.8 Data analysis

Frequency and prevalence (n and %) were used to describe the participants' socio-demographic and obstetric factors and inferential statistics were used to establish associations between prematurity and the various risk factors using a chi-square analysis. Bivariable and multivariate logistic regression were used to determine the factors independently associated with preterm birth. The multivariable model was built using forward regression, and all statistically significant variables in Bivariable analyses were entered one at a time to identify factors associated with preterm birth, keeping only factors that were statistically significant ($p<0.05$).

CHAPTER FOUR

RESULTS

4.1 Socio demographic characteristics

The findings from the research showed that most of respondents 78.8 % were aged between 20 to 35 years. Among respondents 32.5% had no employment and 16.0% with non-education. Most of respondent, (89%) indicated that they were not exposed to tobacco during pregnancy, respondents exposed to tobacco were 9.8%, and 1.3% had high exposure to tobacco during pregnancy. The majority of respondents (89.3%) didn't use alcohol during pregnant while 10.8% used it.

Most of respondents were in normal range of nutrition status based on the measures taken; 68.3% with a BMI between 18.5-24.9, 23.1% had a BMI below18.5 and 8.3% had a BMI above 24.9, while on MUAC, the majority of participants (62.3%) had MUAC between 24-30cm which consider as normal as study state and 28.5% had MUAC below 24 cm which was considered as under nutrition. A quarter of respondents (27.1%) gained below 2kg per month during pregnancy and 66.2% gained around 2kg. About marital status 89% were married /cohabitating and 11.0% were single/ separated. Majority of respondents (92.3%) had health insurance vs. 7.8% without health insurance; also 49% were in "ubudehe" categories 3 while 43.5% and 7.5% were in categories 2 and 1 respectively. Other socio demographic variables are presented in Table 1**.**

Table 1. Socio demographic characteristic of participants

Variable	Term n(%)	Preterm n(%)	Total n (%)
Age (n=400)			
<20years	6(16.7)	33(9.1)	39(9.8)
20 to 35 years	23(63.9)	292(80.2)	315(78.8)
> 35years	7(19.4)	39(10.7)	46(11.5)
BMI[a] (n=398)			
<18.5	80(22.1)	12(33.3)	92(23.1)
18.5 to 24.9	251(69.3)	22(61.1)	273(68.6)
>24.9	31(8.6)	2(5.6)	33(8.3)
MUAC[b] (n=400)			
< 24 cm	96(26.4)	18(50.0)	114(28.5)
24 to 30 cm	239(65.7)	10(27.8)	249(62.3)
>30cm	28(8.0)	8(22.2)	37(9.3)
Weight gain during pregnancy (n=399)			
< 2kg per month	90(24.8)	18(50.0)	108(27.1)
1 to 2kg per month	251(69.1)	13(36.1)	264(66.2)
>2kg per month	22(6.1)	5(13.9)	27(6.8)
Marital status (n=400)			
Single Divorced/separated	38(10.4)	6(16.7)	44(11.0)
Married/ Cohabiting	326(89.6)	30(83.3)	356(89.0)
Level of education (n=400)			
No education	56(15.4)	8(22.2)	64(16.0)
Primary	170(46.7)	22(61.1)	192(48.0)
Secondary	131(36.0)	5(13.9)	136(34.0)
University	7(1.9)	1(2.8)	8(2.0)
Occupation (n=400)			
No employed	284(78.7)	33(91.7)	317(79.8)
Employed	77(21.3)	3(8.3)	80(20.2)
Smoking during pregnancy (n=400)			

No Exposure	326(89.6)	30(83.3)	356(89.0)
Exposure	33(9.1)	6(16.7)	39(9.8)
High Exposure	5(1.4)	0(0.0)	5(1.3)
Use of alcohol during pregnancy (n=400)			
Yes	36(9.9)	7(19.4)	43(10.8)
No	328(90.1)	29(80.6)	357(89.3)
Health insurance			
Yes	342(94.0)	27(75.0)	369(92.3)
No	22(6.0)	9(25.0)	31(7.8)
Ubudehe Cat			
Categ 1	26(7.1)	4(11.1)	30(7.5)
Categ 2	157(43.1)	17(47.2)	174(43.5)
Categ 3	181(49.7)	15(41.7)	196(49.0)

[a]**BMI =**Body Mass Index

[b]**MUAC =**Mid Upper Arm Circumference

4.2 Obstetrical characteristic of respondents

The findings from this study showed that the great majority of respondents (93.5%) had less than five pregnancy, while 9.3 % had an inter pregnancy interval of 1 year, 43.8% of respondents had an inter pregnancy interval of 2 years and respondents with inter pregnancy interval above 2 years represented 37.3%. The majority of respondents (98%) reported no history of previous preterm deliveries. More than half of respondents (57.5%) had spontaneous vaginal delivery and 42.5% delivered by cesarean Section. .Spontaneous labour represented 51.3% of respondents and 48.8% were induced. Only 4.3% of respondents had twin's deliveries, and 9% of all respondents delivered preterm babies. Of all babies delivered, 46.3% were male and 53.8% were Female. Regarding to Antenatal care attendance this study showed that only 32.8% of respondents attended 4 visits in ANC, 3 visits were done by 25% and one to 2 visits done by 11.3% and 31% respectively. Antepartum hemorrhage histories were reported by 13% of respondents. About 5.8% of respondents were admitted due to PROM or PPROM for more than 18 hours. In total 3.3% of respondents have lost their babies during labour or immediately after delivery. No artificial fertilization was reported. Of all respondents 9% had preterm birth and 5.6% were classified as extremely preterm, 16.7% were very preterm, 22.2% were moderate preterm and 55.6% were late preterm. Other obstetrical variables are presented in Table2**.**

Table 2. Obstetrical characteristic of respondent

Variable	Term n(%)	Preterm n(%)	Total n &(%)
Parity (n=399)			
< 5	343(94.5)	30(83.3)	373(93.5)
> 5	20(5.5)	6(16.7)	26(6.5)
Inter pregnancy interval (n=358)			
<1year	31(8.5)	6(16.7)	37(9.3)
1 to 2 years	166(45.6)	9(25.0)	175(43.8)
>2	137(37.6)	12(33.3)	149(33.7)
History of preterm birth (n=400)			
Yes	6(1.6)	2(5.6)	8(2.0)
No	358(98.4)	34(94.4)	392(98.0)
Mode of delivery (n=400)			
SVD[a]	204(56.0)	26(72.2)	230(57.5)
CS[b]	160(44.0)	10(27.8)	170(42.5)
Onset of labor (n=400)			
Spontaneous	184(50.5)	21(58.3)	205(51.3)
Induced labor	180(49.5)	15(41.7)	195(48.8)
Multiple Pregnancy (n=400)			
Yes	13(3.6)	4(11.1)	17(4.3)
No	351(96.4)	32(88.9)	383(95.0)
Sex of the baby (n=400)			
Male	164(45.1)	21(58.3)	185(46.3)
Female	200(54.9)	15(41.7)	215(53.8)
Babies outcomes (n=400)			
Alive	353(97.0)	34(94.4)	387(96.8)
Died	11(3.0)	2(5.6)	13(3.3)
Number attended ANC[c] (n=400)			
Once	41(11.3)	4(11.1)	45(11.3)

2 times	110(30.2)	14(38.9)	124(31.0)
3 times	86(23.6)	14(38.8)	100(25.0)
4 or more times	127(34.9)	4(11.1)	131(32.8)
Ante partum hemorrhage (n=400)			
Yes	44(12.1)	8(22.2)	52(13.0)
No	320(87.9)	28(77.8)	348(87.0)
PROM or PPROM[d] (n=400)			
Yes	19(5.2)	4(11.1)	23(5.8)
No	345(94.8)	32(88.9)	377(94.3)
In-Vitro fertilization (n=400)			
Yes	0(0.0)	0(0.0)	0(0.0)
No	400(100.0)	400(100.0)	400(100.0)
Preterm classifications(n=400)			
Extremely preterm(<28WA)	0(0.0)	2(5.6)	2(0.5)
Very preterm(28-31WA)	0(0.0)	6(16.7)	6(1.5)
Moderate preterm(32-33WA)	0(0.0)	8(22.2)	8(2.0)
Late preterm(34-36WA)	0(0.0)	20(55.6)	20(5.0)
Gestation age (n=400)			
<37 Weeks	0(0.0)	36(100.0)	36(9.0)
37-42Weeks	340(93.4)	0(0.0)	340(85.0)
>42 Weeks	24(6.6)	0(0.0)	24(6.0)

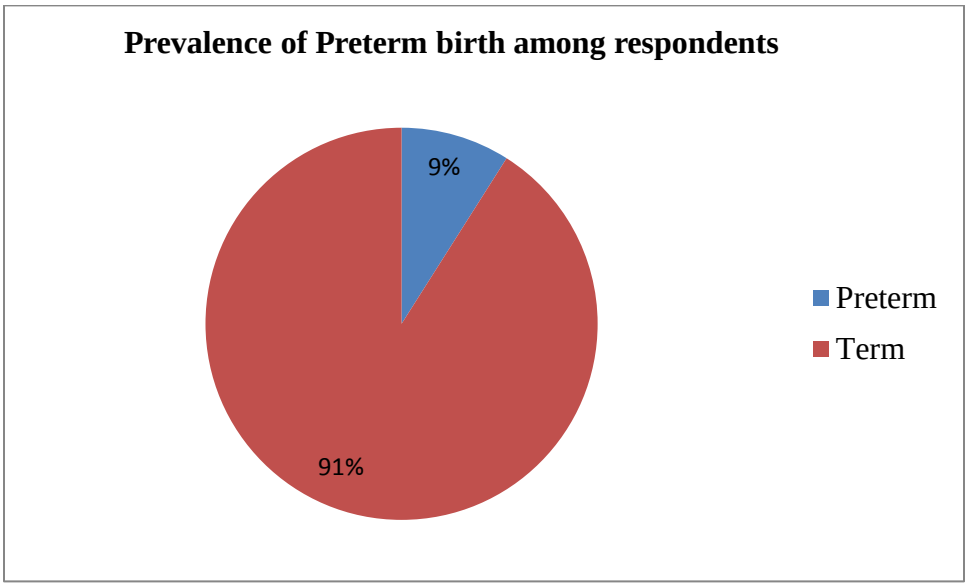
[a]**SVD**=Spontaneous Vaginal Delivery

[b]**CS**=Cesarean Section

[c]**ANC=**Antenatal Care

[d]**PPROM=** Prelabor Premature Rupture of Membrane

Figure 2. Prevalence of Preterm birth among respondents



4.3 Medical conditions and psychological aspects of respondents

Only 2.5% of respondents were HIV Positive. The greater part of respondents (84.8%) had normal range of hemoglobin level (Hb) i.e. Hb>12gr/dl and 15.3% of respondents had Hb<12gr/dl. Of all respondents (8%) had Hypertensive disorders (pregnancy induced hypertension, Pre-eclampsia or Eclampsia) and 26.8% of women reported history of burning sensation during urination or UTI during the pregnancy. Cardiopathy cases represented 0.3% of all respondents, asthma cases were 0.3%, and 1% of respondents had gestation diabetes. Malaria during pregnancy period was reported by 8.2% of respondents. An average of 55% of respondent scored no stress and 39.8 reported moderate stress in the month before delivery, while only5.3% showed that they met with high level of stress.

Table 3. Medical and psychological condition of respondents

Variable	Term n(%)	Preterm n(%)	Total n &(%)
HIV status (n=396)			
Positive	8(2.2)	2(5.6)	10(2.5)
Negative	352(97.8)	34(94.4)	386(97.5)
Hypertension or Eclampsia (n=400)			
Yes	28(7.7)	4(11.1)	32(8.0)
No	336(92.3)	32(88.9)	368(92.0)
UTI[a] during the pregnancy (n=400)			
Yes	94 (25.8)	13(36.1)	107(26.8)
No	270(74.2)	23(63.9)	293(73.3)
Diabetes (n=400)			
Yes	3(0.8)	1(2.8)	4(1.0)
No	361(99.2)	35(97.2)	396(99.0)
Asthma (n=400)			
Yes	1(0.3)	0(0.0)	1(0.3)
No	363(99.7)	36(100.0)	399(99.8)
Cardiopathy (n=393)			
Yes	1(0.3)	0(0.0)	1(0.3)
No	357(99.7)	35(100.0)	392(99.7)
Hemoglobin level (n=363)			
<12 g/dl	52(14.3)	9(25.0)	61(15.3)
>12 g/dl	312(85.7)	27(75.0)	339(84.8)
Malaria (n=392)			
Yes	26(7.3)	6(16.7)	32(8.2)
No	330(92.7)	30(83.3)	360(91.8)
Stress level (n=400)			
No stress	35(9.6)	10(27.8)	45(11.3)
Moderate Stress	183(50.3)	9(25.0)	192(48.0)
High level of stress	146(40.1)	17(47.2)	163(40.8)

[a]**UTI**: Urinary Tract Infection

4.4 Association between social demographical data and preterm birth

In bivariable analysis, respondents who had gained less than 2kg per month during pregnancy (P=0.004; OR 3.18) are3 times more likely to experience a preterm birth than respondents who gained 2kg or more. Unemployed respondents have less risk of having preterm birth compared to farmer and self-employed respondents (OR: 0.29).Also having health insurance were found to be protective as women with health insurance have less risk of having preterm birth compared to women without health insurance(OR**:**0.19). However, other social demographical variables like maternal age, marital status, BMI, alcohol use during pregnancy (OR: 0.45, CI: 0.186-1.112), smoking during pregnancy (OR: 0.50, CI: 0.19-1.305), having "Ubudehe" categories were not found to be associated with preterm birth. (Table 4)

Table 4. Bivariable analysis of the association between social demographical data and preterm birth

	Bivariable analysis			
Factors	**Term (n)%**	**Preterm (n)%**	**CI (95%)**	**P-Value**
Age				
<20	33 (84.6)	6 (15.4)	0.98 (0.30-3.22)	0.983
20-35	292 (92.7)	23 (7.3)	1	
< 35	39 (84.8)	7 (15.2)	2.27 (0.91-5.65)	0.760
BMI				
<18.5	80 (87.0)	12 (13.0)	0.430(0.09-2.03)	0.287
18.5 to 24.9	251 (91.9)	22 (8.1)	1	
>24.9	31(93.9)	2 (6.1)	0.73 (0.16-3.28)	0.688
Weight gain				
< 2kg per month	90(83.3)	18 (16.7)	**4.38(1.43-13.44)** **	**0.010****
2kg per month	251 (95.1)	13 (4.9)	1	
>2 per month	22(81.5)	5 (18.5)	1.13(0.38-3.39)	0.819
Marital Status				
single/divorced/separated	326(91.6)	30 (8.4)	0.58(0.22-1.49)	0.260

Married/cohabitation	38(86,4)	6 (13.6)	1	
Education				
No formal Education	56(87.5)	8 (12.5)	3.74 (0.38-36.50)	0.256
Primary	170(88.1)	22 (11.5)	1.10 (0.13-9.40)	0.928
Secondary	131(96.3)	5 (3.7)	1.00 (0.10-9.22)	1.000
University	7(87.5)	1 (12.5)	1	
Occupation				
No employed	121(95.3)	6 (4.7)	**0.29 (0.12-0.74)** *	**0.010***
Farmers	163(85.8)	27 (14.2)	0.99 (0.11-8.67)	0.994
Self-employed/Business	57(96.6)	2 (3.4)	1.41 (0.27-7.22)	0.678
Formal employed	20(95.2)	1 (4.8)	1	
Smoking				
No Exposure	326(91.6)	30 (8.4)	1	
Exposure	33(84.6)	6 (15.4)	0.50 (0.19-1.30)	0.159
High Exposure	5(100)	0 (0.0)	0	0.999
Alcohol use				
Yes	36(83.7)	7 (16.3)	0.45 (0.18-1.11)	0.840
No	328(91.9)	29 (8.1)	1	
Health Insurance				
Yes	342(92.7)	27(7.3)	1	
No	22(71.0)	9(29.0)	**0.19(0.08-0.46)** *	**<0.001***
Ubudehe Cat				
Categ 1	26(86.7)	4(13.3)	0.53(0.16-1.74)	0.303
Categ 2	157(90.2)	17(9.8)	0.76(0.37-1.58)	0.471
Categ 3	181(92.3)	15(7.7)	1	

4.5 Association Between obstetrical condition of respondents and preterm birth

In bivariable analysis, the interpregnancy interval less than 12months (OR: 5.53, CI: 2.01-15.07), and multiple pregnancies (OR: 3.37, CI: 1.04-10.95) were found to be associated with preterm birth (Table 5). Respondents with more than 5 parities have less risks of preterm birth (OR: 0.29, CI: 0.10- 0.78) compare to those with less than 5 parities. Attending 2 and 3 ANC visits was protective of having preterm birth. However, this study did not find any association between preterm birth and antepartum haemorrhage (OR: 0.48; CI: 0.20-1.12) .Table 5

Table 5. Bivariable analysis of the association between obstetrical condition of respondents and preterm birth

	Bivariable analysis			
Factors	**Term (n)%**	**Preterm (n)%**	**CI[a] (95%)**	**P-Value**
Parity				
< 5	343 (92.0)	30 (8.0)	**1**	
>5	20 (76.9)	6 (23.1)	**0.29 (0.10- 0.78)** *	**0.014***
Inter pregnancy interval				
<12months	31 (83.8)	6 (16.2)	**5.53 (2.01-15.07)** **	**0.001****
12 to 24 months	163 (94.9)	9 (5.1)	**3.42 (1.32-8.85)** **	**0.011****
>24months	137 (91.9)	12 (8.1)	1	
History of preterm birth				
Yes	6 (75.0)	2 (25.0)	0.28 (0.05-1.46)	0.133
No	358 (91.3)	34 (8.7)	1	
Mode of delivery				
SVD[b]	204 (88.7)	26 (11.3)	0.49 (0.23-1.04)	0.065
CS[c]	160 (94.1)	10 (5.9)	1	
Onset of labor				
Spontaneous	184 (89.8)	21 (10.2)	0.73 (0.36-1.46)	0.374
Induced	180 (92.3)	15 (7.7)	1	
Multiple Pregnancy				
Yes	13 (76.5)	4 (23.5)	**3.37 (1.04-10.95)** **	**0.043****
No	351 (91.6)	32 (8.4)	1	
Sex of baby				

Male	164 (88.6)	21 (11.4)	0.58(0.29-1.17)	0.131
Female	200 (93.0)	15 (7.0)	1	
Number attended ANC[d]				
Once	41 (91.1)	4 (8.9)	0.32 (0.07-1.34)	0.121
2 times	110 (88.7)	14 (11.3)	**0.19 (0.06-0.60)** *	**0.005***
3 times	86 (86.0)	14 (14.0)	**0.24 (0.07-0.77)** *	**0.016***
4 or more times	127 (96.9)	4 (3.1)	1	
Ante partum hemorrhage				
Yes	44 (84.6)	8 (15.4)	0.48 (0.20-1.12)	0.090
No	320 (92.0)	28 (8.0)	1	
PROM or PPROM				
Yes	19 (82.6)	4 (17.4)	0.44(0.14-1.37)	0.158
No	345 (91.5)	32 (8.5)	1	

[a]: **CI**; Confidential Interval

[b]:**SVD**:Spontaneous Vertex Delivery

[c]: **CS**: Cesarean Section

[d]:**ANC**:Antenatal Clinic

******: Indicate that p-Value statistically significant

***:** Indicate the P value were protective

4.6 Association between medical and psycho-social condition of respondents and preterm birth

In bivariable analysis, being stressed with moderate and high level of stress during pregnancy, (OR: 2.24, CI: 1.03-5.82) and (OR: 5.81, CI: 2.20- 15.33) respectively had positive association with preterm birth, also having a MUAC <24cm (OR: 6.59, CI: 2.41-18.03). However, this study did not find any association between preterm birth and pregnancy induced hypertension or Eclampsia (OR: 0.667, CI: 0.22-2.02), UTI (OR: 0.61, CI: 0.30-1.26), and some chronical disease like Asthma, diabetes and cardiopathy. Table 6

Table 6. Bivariable analysis of the association medical and psycho-social condition of respondents and preterm birth

	Bivariable analysis			
Factors	**Term (n)%**	**Preterm (n)%**	**CI[a] (95%)**	**P-Value**
MUAC				
< 24 cm	96 (84.2)	18 (15.8)	**6.59 (2.41-18.03)** **	**<0.001****
24 to 30 cm	239 (96.0)	10 (4.0)	1	
>30cm	29 (78.4)	8(21.6)	1.47(0.58-3.73)	0.416
HIV status				
Positive	8 (80.0)	2 (20.0)	0.38 (0.79-1.89)	0.241
Negative	352 (91.2)	34 (8.8)	1	
Hemoglobin level				
<12 g/dl	52 (85.2)	9 (14.8)	0.50(0.22-1.12)	0.093
>12 g/dl	312 (92.0)	27 (8.0)	1	
Hypertension / Eclampsia				
Yes	28 (87.5)	4 (12.5)	0.66 (0.22-2.02)	0.473
No	336 (91.3)	32 (8.7)	1	
UTI during pregnancy				
Yes	94 (87.9)	13 (12.1)	0.61(0.3-1.26)	0.187
No	270(92.2)	23(7.8)	1	
Diabetes				
Yes	3 (75.0)	1 (25.0)	0.29 (0.02-2.87)	0.290
No	361 (91.2)	35 (8.8)	1	
Malaria				
Yes	26 (81.3)	6 (18.8)	0.39(0.15-1.03)	0.058
No	330 (91.7)	30 (8.3)	1	
Stress level				
No stress	35(77.8)	10(22.2)	1	
Moderate stress	183(95.3)	9(4.7)	**2.24(1.03-5.82)** **	**0.042****
High level of stress	146(89.6)	17(10.4)	**5.81(2.20-15.33)** **	**<0.001****

4.7. Multivariable analysis of factors associated with preterm birth

In multivariable analysis gaining less than 2 kg per month during pregnancy (OR: 3.89, CI: 1.10–13.77) interpregnancy interval below 12 months (OR: 7.60, CI: 1.10–52.43), high level of stress during pregnancy (OR: 7.68, CI: 1.37–42.92) and MUAC (OR: 5.85; CI: 1.26-27.24) were found to be associated with preterm birth (Table 6). Multiple pregnancies, number of ANC visits, occupation and parity, significant in bivariable analysis were not found to be associated with preterm birth in multivariable analysis.

Table 7. Multivariate logistic regression of significant factors

Factors	AOR	CI (95%)	P-Value
Interpregnancy interval			
<12months	**7.60**	**1.10-52.43****	**0.039****
12 to 24 months		**1**	
>24months	1.71	0.24-12.18	0.58
Stress level during pregnancy			
No stress		1	
Moderate stress	1.16	0.20-6.53	0.861
High level of stress	**7.68**	**1.37-42.92****	**0.020****
Multiple pregnancy			
Yes	0.25	0.05-1.26	0.094
No		**1**	
Weight gain during pregnancy			
< 2kg per month	**3.89**	**1.10-13.77****	**0.035****
2kg per month		**1**	
>2 per month	1.83	0.46-7.14	0.384

MUAC			
< 24 cm	**5.85**	**1.26-27.24****	**0.024****
24 to 30 cm		1	
>30cm	3.34	0.60-18.54	0.168
Health Insurance			
Yes		1	
No	0.27	0.08-0.83	0.24
Parity			
<5		1	
>5	2.91	0.84-10.04	0.089
Number attended ANC			
Once	0.16	0.03-0.92	0.041
2 times	0.20	0.05-0.78	0.021
3 times	0.19	0.05-0.74	0.017
4 or more times		1	

******: Indicate that p-Value statistically significant

CHAPITER FIVE

DISCUSSION AND CONLUSION

he main findings of this study were hospital based prevalence rate of preterm birth in Nyamata DH was 9 % .This study also showed other prevalence like the prevalence of anemia that was 15.3% which almost comparable to the findings of DHS 2015 and of another hospital-based study conducted in Kigali and the Northern province of Rwanda (26,29,30). The found prevalence of diabetes of 1% was slightly higher compare to the findings of the above mentioned hospital-based study conducted in Kigali and the Northern province of Rwanda (29). This small difference may be explained by the fact that Nyamata hospital has adopted new protocol for detection of all chronic diseases with a full checkup of all pregnant women admitted in hospital even during routine ultrasound check up (Personal communication). HIV positive respondents were 2.5% this is low compare to RDHS and may link to limited time period of the study of one month. Self-reported malaria cases during pregnancy were 8.2%, this may be over reported by women by confusing other infection with fever to malaria infection. Compared to other studies this study also showed prevalence of preterm classification where extremely preterm count5.6% of all preterm babies in this study, very preterm account for16.7%, moderate preterm for 22.2% and late preterm accounting for 55.6%, this was comparable to the findings of different studies in literature where they showed big number of premature babies were located in late preterm, followed by moderate preterm, very preterm and extremely preterm respectively(2,7).

This study also showed socio demographic factors associated with preterm birth like weight gain during pregnancy and obstetrical, factors such as interpregnancy interval, and higher stress level are independently associated with preterm birth. More women who delivered preterm were under nourished (weight gain and MUAC). No statistical differences were noted for the prevalence of HIV positive status between those who delivered preterm versus term. The high rate of preterm birth in this study is in agreement with a World Health Organization (WHO) shows that the prevalence range between 5% to18% are public health problem(1).

The prevalence of preterm birth of 9% found in this study appears half of those found in African countries. As different study showed a prevalence of preterm birth of 18,1% in Malawi.

In Comoros the prevalence of preterm birth was 16.7%,16.7% in Congo, 16.6% in Zimbabwe, 16.5%, in Equatorial Guinea, 16.4%, in Mozambique, 16.3%, in Gabon: and 15.4% in Mauritania ;WHO report 2018(1). The found prevalence in a higher middle- income country outside Africa (Iran), was almost the half of the prevalence found by our study (25).

The findings from our study indicated that there is influence of weight gain during pregnancy on preterm birth where result from the study show that there is positive association between weight gain during pregnancy and preterm birth and this was similar to study done in Malawi(18) ,and different to the study conducted in Iran (25). Furthermore the study indicated that other demographical data from study like maternal body mass index find not significant from this study and also not significant in the study mentioned below, but significant in the study done in Brazil, Malawi and Iran (16,18,25). Alcohol use and tobacco exposure in this study are not associated with preterm birth which is similar to result of study in Kenyatta hospital (3).

Interpregnancy interval found to be associated with preterm birth which is different to the finding from study in Kenyatta hospital. Moreover our study indicated that the occurrence of preterm birth among women delivered at Nyamata hospital was associated with the stress level of respondents similar to study in Brazil(16). In addition the respondents who had MUAC below 24 cm were found to have significant association with the preterm birth ,which was different to the study conducted in Kenya (3).

The findings from our study indicated that multiple pregnancies is not associated with preterm birth which is different to the study conducted in Tanzania and study conducted in Kenya which found that multiple pregnancy was associated with the occurrence of preterm birth(3,14). Multiple pregnancies is knowing risk factors associated with preterm birth due to uterine over distension, but in this study found not significant, this may be due to few number of twins in our simple size.

The study indicated that ANC attendance were not associated with preterm birth among women who delivered at Nyamata hospital and this was similar to studies conducted in Indonesia, Kenya and Brazil (3,19,24). But in this study ANC attendance found to be protective; means women who attend at least one antenatal care visit have less risk of having preterm birth compare to women who did not attend.

This may have been due to the influence of Focused Antenatal Care (FANC) approach in Rwanda which has emphasized the need to have four targeted antenatal visits (31). Pregnancy induced hypertension or eclampsia was not associated with the occurrence of preterm birth among woman delivered at Nyamata hospital. This finding is different from result of studies conducted in Tanzania, Brazil and Iran (6,13,14).This may be due to Rwanda efforts in detection and management of such conditions during antenatal care and every women's visit to health facility.

Study limitations of study

The study prevalence was hospital-based and this prevents the inference of the result at the national level; Women who delivered at health centre were not including in this study due to financial constraints. The found prevalence may look to be small due to the fact we did not include participants from health centres where the majority of deliveries occur in Rwanda.

Conclusion

The prevalence of preterm birth of this study was smaller to the prevalence found in other African countries and higher compared to worldwide prevalence. This prevalence is also higher when compared to the ambition of Rwanda as a country that has managed to reach MDGs 4 and which is now looking forward to reaching SDGs. Factors related to nutritional status such as weight gain during pregnancy and MUAC< 24 cm have found to have been found to have a big influence on the occurrence of preterm birth among women delivered at Nyamata Hospital. Furthermore, this study found also different obstetrical and psychological conditions like, interpregnancy interval and high stress level during pregnancy to be associated with the occurrence of preterm birth among woman delivered at Nyamata Hospital. At risk women should receive special care and designed interventions such as dedicated preterm birth prevention clinics, preconception care package and antenatal care package including nutrition are suggested in order to prevent preterm birth.

Policy and programmatic recommendations

The preterm birth causes are complex and vary across countries and regions. Therefore there are many interventions that can be done to prevent the occurrence of preterm births. Based on the conclusion from the results of this study we recommend the following to:

Nyamata District hospital

- To increase the community awareness on preterm birth, risk factors, causes prevention and management.
- To establish innovative strategies to improve maternal nutritional status like initiating pregnant women supportive at health center level and engage stakeholders and build commitment in activities which help those women to find balanced diet easily (activities like offering /commit their resource to nutritional (anemia mitigation and reduction) and mobilize community especially every women to have a kitchen garden("Akarima k' igikoni") and teach about food preparation
- To strengthen health centres supervision in ANC provision to ensure quality of ANC services.

Health centers (Bugesera District)

To the in charge of the health centres (all) to increase the advocacy of ANC attendance among pregnant women in their serving areas

- To improve quality of ANC in health centres emphasizing on increasing awareness on maternal nutrition during pregnancy (From pre-conception period).
- To emphasize on the early identification, prevention and management of medical condition among pregnant women likely to cause preterm birth, such as under nutrition.
- To enhance better access to family planning and empowering women with accurate health information and access to quality services.
- To increase awareness in post partum family planning (PPFP) in order to prevent preterm birth linked to interpregnancy interval below 12 months.
- To increase iron or folic acid supplementation for all women during the period of pregnancy to prevent anemia by increasing haemoglobin level.

- To increase awareness in men (men involment in care of pregnancy women) about their role in pregnancy life of their women such as to provide nutrition support and psychological support.

Health provider:

- To improve quality of care through information education and communication, and delivering full packages especially nutrition and danger signs during pregnancy.

Community Health Workers

- To keep sensitization to community for behaviour change focusing on nutrition of women in reproductive age and pregnant women.

Pregnant women

- To use kitchen garden ("Akarima k'igikoni") to plant different vegetables and legumes comprise all nutrients especially containing iron

Public health sectors (Ministry of Health and Other related sectors)

- To increase awareness among stakeholder on integrating special nutrition program to women in reproductive age, especially during pregnant for better nutrition status.
- To integrate some sessions related to mental health issue in Antenatal packages in order to help women with perceived stress and to mitigate its complications.
- To increase the necessary abilities for women in achieving social resource needed for maintaining mental health and resisting against the stressful life events.
- To increase number of midwife at health centre level to well and timely diagnose and manage antepartum haemorrhage.
- To Design other study for long period to more investigate other risk factors associated with preterm birth.

Policy makers

- To formulated a new policy related to nutrition program among pregnant women in Rwanda
- To reinforce existing policy designed for family planning to ensure birth spacing
- To initiate/advocate special period for sport designed for pregnant mother
- To advocate/plan for new program designed to high risk women of having preterm in order to mitigate and manage the problem.
- To support, advocate and integrate implementation of group antenatal care in all health centers

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APPENDICES

ANNEXE 1. QUESTIONNAIRE (English)

INSTRUCTIONS TO INTERVIEWERS

i. Ensure respondents to this questionnaire are the biological mothers of the child who delivered in Nyamata District Hospital in the study period.

ii. For questions with alternatives fill **X** in the number bearing the response in the brackets provided at the end of each question as appropriate.

iii. Don't suggest responses for the respondent.

Study No..... **Date of interview**.....

SECTION A: DEMOGRAPHIC INFORMATION

A 1. What is your place of living?
1. District.....
2. Sector …….
3. Cell …….
4. Village.....
A 2. How old are you? (Mu myaka) ……
A 3a. What is your height? (cm) ……..
A 3b. What was your weight before pregnancy? (kg)…….
A 4. What was your weight gain during pregnancy? (kg) ……..
A5. Marital status.
☐ 1. Married.
☐ 2.Cohabiting
☐ 3.Divorced/separated
☐ 4.Widowed
☐ 5.Single (never married)
A6.Social economic status
A6a. Maternal level of education
☐ 1.No formal education
☐ 2.Not completed Primary
☐ 3.Completed Primary

☐ 4.Completed Secondary
☐ 5.Not completed Secondary
☐ 6.Not completed College/university education
☐ 7.completed College/university education
A6b. Maternal occupation.
☐ 1.No employment
☐ 2.Subsistence farming/Casual work
☐ 3.Self-employed/Business
☐ 4.Formal employment
☐ 5.Student
A7. Did you or/and your partner smoke tobacco during your pregnancy?
☐ 1.None of us smoked
☐ 2.I smoked but my partner did not
☐ 3.Only my partner smoked
☐ 4.Both of us smoked
A8. Did you use alcohol during the pregnancy?
☐ 1.YES
☐ 2.NO
A9. Maternal left mid upper arm circumference (MUAC)
☐ 1.< 24 cm
☐ 2.between 24 and 30 cm
☐ 3.Above 30 cm
SECTION B: OBSTETRIC AND NEONATAL INFORMATION
Part 1: Information from the mother
B1.1 How many times have you been pregnant before? .....
B1.2 When was your LMP? .....
B1.3 When did you deliver your baby? (Dd/mm/yr).....
B1.4When was your previous delivery? (Dd/mm/yr).....
B1.5 Inter-pregnancy interval (in months).....
B1.6 Is your last baby before this one alive or dead?

☐ 1.Alive
☐ 2.Dead
☐ 3.Never been pregnant before
☐ 4.Miscarriage
B1.7 Were any of your other children born more than 1 month before the expected time?
☐ 1.Yes
☐ 2.No
B1.7.a. If the answer to question 17 is yes, how many times (....) and at what gestation?.....(in weeks)
Part 2: Information from the antenatal card or mother's file
B2.1. Mode of delivery
☐ 1.SVD
☐ 2.CS
B2.2 Onset of labor
☐ 1.Spontaneous
☐ 2.Induced labor or C/S due to medical indication
B.2.3. Pregnancy outcome
☐ 1.Singleton
☐ 2.Twins or more
B2.4. Birth weight.....
B2.5.Sex of the baby
☐ 1.Male
☐ 2.Female
B.2.6. Sex of baby(if multiple birth)
☐ 1.Male
☐ 2.Female
B.2.7 ANC attendance
☐ 1.Yes
☐ 2.No
B.2.8 Number of times attended ANC?

☐ 1.Once
☐ 2.2 times
☐ 3.3 times
☐ 4.4 or more times
B.2.9. Gestation by dates
☐ 1.below 37 weeks
☐ 2.37to 42 weeks
☐ 3.Above 42 weeks
B.2.10. History of In-Vitro or artificial fertilization
☐ 1.Yes
☐ 2.No
B.2.11. Antepartum haemorrhage
☐ 1.Yes
☐ 2.No
B.2.12. PPROM or PROM >18Hrs
☐ 1.Yes
☐ 2.No
B.2.13 Babies outcomes
☐ 1.Alive
☐ 2.Dead
Section C:Medical History
C1. HIV status
☐ 1.Positive
☐ 2.Negative
C2. Hemoglobin level (g/dl
☐ <12 g/dl
☐ > 12 g/dl
C3. Pregnancy induced hypertension or Eclampsia
☐ 1.Yes
☐ 2.NO

C4. History of drainage of liquor for more than 18 hours (PROM or PPROM)
☐ 1.Yes
☐ 2.No
C5. History of burning sensation during urination or UTI during the pregnancy?
☐ 1.Yes
☐ 2.No
C6. History of pre-existing conditions and other chronical diseases or/and infectious diseases
C6a.Diabetes
☐ 1.Yes
☐ 2.No
C6b.Asthma
☐ 1.Yes
☐ 2.No
C6c. Cardiopathy
☐ 1.Yes
☐ 2.No
C6d.Malaria
☐ 1.Yes
☐ 2.No
Section D. Perceived stress scale
D1.In last month, how often have you been upset because of something that happen unexpectedly?
☐ 1 Never
☐ 2Almost never
☐ 3 Sometimes
☐ 4 fairly often
☐ 5Very often
D2.In the last month ,how often have you felt that you were unable to control the important things in your life
☐ 1Never

☐ 2Almost never
☐ 3Sometimes
☐ 4Fairly often
☐ 5Very often
D3. In the last month, how often have you felt nervous and stressed?
☐ 1 Never
☐ 2Almost never
☐ 3Sometimes
☐ 4 Fairly often
☐ 5Very often
D4.In the time of pregnancy, how often worried with the way you live in general?
☐ 1Never
☐ 2Almost never
☐ 3Sometimes
☐ 4 Fairly often
☐ 5Very often

ANNEXE 2. QUESTIONNAIRE (Kinyarwanda)

AMABWIRIZA KUBABAZAN'ABABAZWA

i.Usubiza iribazwa agomba kuba mama wumwana wavutse bwite,kandi yabyariye mubitaro bya Nyamata mugihe cyubushakashatsi.

ii. Kubibazo bifite ibisubizo ushobora guhitamo koresha akamenyetso X ,mukazu kari imbere yigisubizo wahisemo.

iii. Ntaguhitiramo cg kubwira usubiza,igisubizo akwiye gusubiza.

No yubushakashatsi: ..... Itariki ibazwa ryabereyeho: .....

IGIKA A: AMAKURU YEREKEYE UGIZE URUHARE MUBUSHAKASHATSI

A 1. Utuyehe?
1. Akarere.....
2. Umurenge …….
3. Akagali …….
4. Umudugudu.....
A 2. Ufite imyaka ingahe? (Mu myaka) ……
A 3a. Uburebure? (cm) ……..
A 3b. Wari ufite ibiro bingahe mbere yuko utwita iyi nda? (kg)…….
A 4. Wiyongeye ibiro bingahe mugihe warutwite? (kg) ……..
A5.Irangamimerere.
☐ 1. Turasezeranye.
☐ 2.Tubana tudasezeranye
☐ 3.Twaratandukanye
☐ 4.Umupfakazi
☐ 5.Ingaragu
A6.IIcyiciro arimo kubirebana n'amikoro
A6a. Wize amashuri angahe?
☐ 1.Nta na rimwe
☐ 2.Nize abanza sinayarangiza

☐ 3. Nize abanza ndayarangiza
☐ 4. Nize ayisumbuye sinayarangiza
☐ 5. Nize ayisumbuye ndayarangiza
☐ 6. Nize amashuri makuru/kaminuza sinabirangiza
☐ 7. Nize amashuri makuru/kaminuza ndabirangiza
A6b. Icyo umubyeyi akora.
☐ 1. Ntakazi mfite
☐ 2. Guhinga
☐ 3. Kwikorera
☐ 4. Umukozi wa Leta
☐ 5. Umunyeshuri
A7. Ese murugo rwanyu hari umuntu unywa itabi?
☐ 1. Ntawe
☐ 2. Ndarinywa ariko umugabo ntarinywa
☐ 3. Umugabo niwe urinywa
☐ 4. Twese turarinywa
A8. Ese waba unywa ibinyobwa bisembuye?
☐ 1.Yego
☐ 2. Oya
A9. Umuzenguruko wukuboko kumubyeyi
☐ 1.< 24 cm
☐ 2.24 kugeza 30 cm
☐ 3.Hejuru 30 cm
IGIKA B: AMAKURU YO GUTWITA NAYO KUBYARA
Igice cya 1: Amakuru yatangwa n'umubyeyi
B1.1 Ninshuro zingahe watwise,mbere yiyinda? .....
B1.2 Uheruka imihango ryari(umunsi wambere witariki uherukiraho imihango)? .....
B1.3 Wabyaye ryari? (Umunsi/Ukwezi/Umwaka).....
B1.4 Ibyumweru by'inda.....
B1.5 Wabyaye ryali umwana ucutse? (Umunsi/Ukwezi/Umwaka).....

B1.6 Igihe cyirihagati yo kubyara umwana ucutse no gutwita uwo yabyaye (mumezi).....
B1.6 Umwana ucutse ariho cyangwa yarapfuye**?**
☐ 1. Ariho
☐ 2.Yarapfuye
☐ 3.Sinigeze ntwitaho(Ni inda yambere)
☐ 4.Inda yavuyemo
B1.7 Waba warigeze kubyara hasigaye igihe kirenga ukwezi kugirango itariki nyayo yivuka yariteganyijwe igere?
☐ 1.Yego
☐ 2.Oya
B1.7.a. Niba igisubizo kukibazo kibanza ari yego,ninshuro zingahe(....)nikubyumweru bingahe?(...)
Igice cya 2: Amakuru ava kwifishi yo kwipimishirizaho n'ifishi yumubyeyi yibitaro
B2.1. Uburyo Yabyayemo
☐ 1. Nabyaye neza
☐ 2.Yarabazwe
B2.2 Intangiriro yo kujya kunda
☐ 1.Ibise byarizanye
☐ 2.Natewe ibise
B.2.3. Iherezo ry' inda
☐ 1.Umwana umwe
☐ 2.Abana 2 cyangwa barenga 2
B2.4. Ibiro umwana yavukanye.....
B2.5.Igitsina cy'umwana
☐ 1.Gabo
☐ 2.Gore
B.2.6. Igitsina cy'umwana (Niba barenze umwe)
☐ 1.Gabo
☐ 2.Gore
B.2.7 Wagiye kwipimisha inda

☐ 1.Yego
☐ 2.Oya
B.2.8 Wagiye kwipimisha inda inshuro zingahe?
☐ 1.Inshuro1
☐ 2.Inshuro2
☐ 3.Inshuro3
☐ 4.Inshuro4 cg Zirenga
B.2.9. Ibyumweru by'inda
☐ 1.Munsi ya 37
☐ 2.37 kugeza 42
☐ 3. Hejuru 42
B.2.10. Amakuru yuburyo yatwite,waba ari intanga watewe?
☐ 1.Yego
☐ 2.Oya
B.2.11. Waba waraviriye kundamugihe warutwite?
☐ 1.Yego
☐ 2.Oya
B.2.12. Waba warabonye amazi(Kumeneka kwisuha)mugihe cyamasaha 18cg arenga?
☐ 1.Yego
☐ 2.Oya
B.2.12 Babies outcomes
☐ 1.Ariho
☐ 2.Yarapfuye
IGIKA C:AMAKURU KUNDWARA WABA WARARWAYE CYANGWA URWARA?
C1. Ubwandu kundwara ya Sida
☐ 1.Yego
☐ 2.Oya
C2. Ingano y'Amaraso
☐ Munsi ya12 g/dl
☐ >Hejuru ya12 g/dl

C3. Inda yaba yaragize ibibazo biturutse kumuvuduko wamaraso,nizindi ndwara zishamikiyeho?
☐ 1.Yego
☐ 2.Oya
C4. Waba waragize indwara zo munzira yinkari mugihe warutwite?
☐ 1.Yego
☐ 2.Oya
C5. Haba hari ubundi burwayi budakira ubana nabwo nka:
C5a.Diyabete
☐ 1.Yego
☐ 2.Oya
C5b.Asima
☐ 1.Yego
☐ 2.Oya
C5c. Indwara z'umutima
☐ 1.Yego
☐ 2.Oya
C5d.Malariya
☐ 1.Yego
☐ 2.Oya
IGIKA D. IKIGERERANYO CYO GUHANGAYIKA
D1. Mukwezi gushize,ni inshuro zingana iki ibintu byakurenze kandi bije bigutunguye?
☐ 1. Nta narimwe
☐ 2.Gake cyane
☐ 3.Rimwe na rimwe
☐ 4.Kenshi
☐ 5.Kenshi cyane
D2. Mu kwezi gushize ninshuro zinganiki utashoboye kugenzura ibintu byingenzi mubuzima bwawe?
☐ 1.Nta narimwe
☐ 2.Gake cyane

☐ 3. Rimwe na rimwe
☐ 4. Kenshi
☐ 5. Kenshi cyane
D3. Mu kwezi gushize ninshuro zingahe warakaye ukanahangayika ?
☐ 1. Nta narimwe
☐ 2. Gake cyane
☐ 3. Rimwe na rimwe
☐ 4. Kenshi
☐ 5. Kenshi cyane
D4. Ese mugihe warutwite ninshuro zinganiki waba warigeze uhangayika,ufite ubwoba bwimibereho yubuzima?
☐ 1. Nta narimwe
☐ 2.Gake cyane
☐ 3.Rimwe na rimwe
☐ 4.Kenshi
☐ 5.Kenshi cyane

ANNEXE 3. INFORMED CONSENT FORM FOR THE PARTICIPANTS

Inpatient number…….. Study number…….
Ward…… Date…….

Thank you so much for your willingness to take part in this interview. My name is Immaculee MUKANDEPANDASI. I am from University of Rwanda, School of Public Health. I am doing a research study to determine Prevalence and assess factors associated with preterm birth at NYAMATA District Hospital, Bugesera District, Rwanda.

Preterm birth is defined as birth occurring before 37 completed weeks of gestation. About 15 million babies are born into the world before the right time and over 1 million of these babies die each year and others develop long term complications that impair their growth. In addition, the numbers of such births is increasing worldwide. Preterm birth is associated with several factors which may be related to the mother or the baby. The purpose of this study is to determine the burden of preterm birth and the factors that are associated prematurity among women who deliver in NYAMATA District Hospital in the period of study.

We are asking you to participate in a research study. The purpose of this consent form is to give you information you will need to help you decide whether to participate in the study or not. You may ask questions on the risks and benefits of the study on your baby and yourself. First I would like to know if you are interested in taking part in this study. If so, I would like you to first sign a form developed to meet the human subject research requirements. Briefly, the consent form states that: (i) all information provided by you during this conversation will be held confidential, (ii) your participation in this study will be voluntary and you have the right to withdraw to the study at any point of time if you feel uncomfortable (iii) there is no harm of any kind that will be inflicted on you as a result of taking part in this study (iv) there is no direct benefit to participate in this study means no monetary compensation.

I am interested in determining Prevalence and assessing factors associated with preterm birth at NYAMATA District Hospital, Bugesera District, Rwanda.

This will help in developing measures to prevent preterm delivery so as to ensure as many babies as possible are born at term, and there are decreases in fewer than 5 deaths from prematurity complication. I have prepared Questionnaire, that you can provide information from you. I will taking notes to enable us capture all that I shall be provided to be sure I don't miss anything.

Before I start, I just want to emphasize that everything we talk about today is confidential. No one will have access to the tape or notes that I am taking except for those of us working on the project. You should know that no answer is right or wrong. When I write up our report, I will not use the names of any interviewees so that no one can be identified. Also, if at any point during the interview you would like to stop, or if there are any questions you would rather not answer, just let me know - that's fine.

Before we continue, do you have any questions for me?

Voluntary consent

You are free to choose whether or not to partake in the study. You should feel free to ask any questions before, during, and after the interview. If you would like to withdraw from the study, you can do so at any point by contacting Immaculee MUKANDEPANDASI 0788655945, Dr Jean Paul SEMASAKA SENGOMA on 0788842142 and Dr Sabine MUSANGE on 0788420378 or email us on: imukandepandasi@gmail.com, jsengoma@nursph.org samsange@nursph.org.

The Institution Review Board Committee in university of Rwanda has reviewed and approved this project. If you have any concerns about your rights in this project, please contact professor GAHUTU Jean Bosco the Chairperson of Institution Review Board Committee 0783340040 email;jbgahutu@yahoo.com.

Benefits of the study

Your participation in this study will help us identify the factors associated with preterm delivery. This will help in developing measures to prevent preterm delivery so as to ensure as many babies as possible are born at term. Results of the study will be implemented to inform and advance policy planning efforts and it implementation. Following publication, it is expected that findings will help new plan or intervention in reducing preterm birth and related complications.

The risks of the study

You will be examined and the tape measure used to take the circumference of your arm is not invasive and therefore no harm will be caused to you .

Statement of informed consent

- The study has been explained to me in a language that I easily understand. All the questions I had about the study have been clearly answered. I understand what will happen during the interview and what is expected of me.
- Participation is entirely voluntary and you may refuse or withdraw your consent at any stage without it influencing the care you are given in any way.
- I have been informed that anything I say during the interview today will remain completely confidential: my name will not be used nor any other information that could be used to identify me.
- I have read the forgoing information ,or it has read to me.I have had opportunity to ask questions about it and any question that I have asked have been answered to my satisfaction .I consent voluntarily to participate as participant in this research and understand that, I have the right to withdraw from the research at any time without any way affecting my medical care.

If you **AGREE** to take part in the study, please sign below.

Name of woman whom take part in the study:

Signature of woman whom take part in the study:

Date: dd/mm/yr:

Name of Researcher/ Research Assistant……

Signature of Researcher/ Research Assistant ……

Date: dd/mm/yr

Investigator:

RM Immaculee MUKANDEPANDASI Postgraduate student, Public Health Department

University of Rwanda

Supervisors:

1. Dr. J. Paul SEMASAKA, Lecturer, Department of Epidemiology and Biostatistics, School of Public Health, College of Medicine and Health Sciences, University of Rwanda

2. Dr. Sabine MUSANGE, Lecturer, Department of Health Policy, Economics and Management, School of Public Health, College of Medicine and Health Sciences, University of Rwanda

ANNEXE 4. INYANDIKO NYEMEZABUSHAKE

Numero yifishi yumubyeyi……numero yubushakashatsi…….
Servisi umubyeyi arimo…… Itariki…….

Intangiriro

Urakoze cyane kuba wemeye kugira uruhare muri iki kiganiro. Nitwa Immaculee MUKANDEPANDASI. Nturutse muri Kaminuza nkuru y'u Rwanda, icyiciro cya gatatu. Turi gukora ubushakashatsi, mukumenya ikigereranyo cyabana bavuka batagejeje igihe ndetse nimpamvu zishobora gutera kubyara mbere y'igihe mubabyeyi bazabyarira mubitaro bya Nyamata akarere ka Bugesera , mugihe cyubushakashatsi.

Kubyara umwana utagejeje igihe,bivugwa igihe umubyeyi yabyaye umwana mbere yibyumweru 37 byo gutwita,nukuvuga uhereye kumunsi wambere wimihango ,iheruka. Ku isi Abana bagera kuri miliyoni 15 bavuka mbere yigihe cyateganyijwe muri abo bana abagera kuri miliyoni imwe bapfa burimwaka ,abandi bakaba bagira ingorane zitandukanye zubuzima,nko kudakura neza nizindi.Ikiyongeyeho uwo mubare mu isi ukomeza kwiyongera.Kubyara umwana utagejeje igihe bishobora guturuka kumpamvu nyinshi zitandukanye.Intego yububushakashatsi nukumenya ikigereranyo cyabana bavuka batagejeje igihe ndetse nimpamvu zishobora gutera kubyara mbere y'igihe mubabyeyi bazabyarira mubitaro bya Nyamata akarere ka Bugesera , mugihe cyubushakashatsi.

Turagusaba kwitabira ubushakashatsi.Intego yiyinyandiko nukukubwira amakuru yagufasha guhitamo niba witabira cyangwa utitabira.Ushobora kubaza ibibazo kunyunguwabona wowe numwana wawe no kungaruka wahuranazo muri ububushakashatsi.Twifuzaga kubanza kukubaza niba wumva ushaka kugira uruhare muri ubu bushakashatsi, niba ubishaka, twifuzaga ko wabanza gusinya inyandiko twateguye mu rwego rwo kubahiriza ibisabwa mu bushakashatsi bukorerwa ku bantu. Muri make, iyi nyandiko ivuga ko: (i) amakuru yose uza gutanga muri iki kiganiro azagirwa ibanga, (ii) kugira uruhare muri ubu bushakashatsi ni ubushake kandi ufite uburenganzira bwo guhagarika uruhare rwawe muri ubu bushakashatsi mu gihe wakumva bitakiringombwa, (iii) nta ngaruka mbi nimwe izakubaho iturutse ku kuba wagize uruhare muri ubu bushakashatsi, iv)Ntanyungu zakakanya nkamafaranga cyangwa izindi,uzahabwa

kuberawitabiriye ubushakashatsi,gusa inyungu zibizava mubushakashatsi zifasha abanyarwanda nawe urimo.

Dushishikajwe no kumenya ikigereranyo cyabana bavuka batagejeje igihe ndetse nimpamvu zishobora gutera icyo kibazo mubabyeyi babyarira mukarere ka Bugesera mubitaro bya Nyamata,Hagamijwe gutanga amakuru yatuma hakorwa igena migambi rishya ry'uburyo hagabanywa imfu zabana cyane cyane izaturutse kuba bavutse igihe kitageze.Turaza kukubaza bimwe mubibazo, ndetse tunandike bimwe bivuye kwifishi zawe zo kwamuganga kugirango tubashe kubona amakuru ahagije yadufasha kubona ikigereranyo nyacyo nimpamvu zose zatuma haba kuvuka kumwana igihe kitageze.

Mbere y'uko dutangira, nagirango nshimangire ko ibyo turi buganire byose ari ibanga. Nta muntu numwe uzagera kumakuru umpaye cyangwa ndimo nandika ureste abari mwitsinda ry' ubu bushakashatsi. Wakagombye kumenya ko nta gisubizo kiri cyiza cyangwa kibi. Mu kwandika ibyavuye mu bushakashatsi, ntabwo tuzakoresha amazina y'abo twaganiriye kugirango hatagira ubamenya. Ikindi, wemerewe guhagarika ikoreshwa ryamakuru igihe icyo ari cyo cyose nta mbogamizi. Mbere y'uko dukomeza, hari ibibazo wumva wambaza?

Kwemera ku bushake

Ufite uburenganzira bwo guhitamo kugira uruhare muri ubu bushakashatsi cyangwa kubyanga. Wakagombye kumva wisanzuye kubaza ibibazo byose ushaka mbere, hagati, cyangwa nyuma y'ikiganiro. Uramutse wifuje kuva mu bushakakashatsi, Cyangwa gutanga amakuru kubushakashatsi wabikora igihe cyose ushakiye mu kudutelefona kuri numero 0788655945, 0788842142cyangwa se 0788420378 kandi/cyangwa ukatwandikira kuri imeyili: imukandepandasi@gmail.com, jsengoma@nursph.org nokuri samsange@nursph.org.

Komite y'ikigo ishinzwe kurengera abakorerwaho ubushakashatsi yasuzumye kandi yemeza ubu bushakashatsi. Uramutse ugize impungenge/ibibazo byerekeranye n'uburenganzira bwawe muri ubu bushakashatsi, uzaterefone professor GAHUTU Jean Bosco umuyobozi wa komite y'ikigo ishinzwe kurengera abakorerwaho ubushakashatsi kuri 0783340040 cyangwa ukamwandikira kuri imeyili: jbgahutu@yahoo.com.

Inyungu kuwitabiriye ubushakashatsi

Ushobora kutagira inyungu muri ubu bushakashatsi. Kwitabira kwawe bizadufasha kumenya byinshi kumpamvu zitera kubyara mbere yigihe giteganyijwe,no gukusanya imibare yabana bavuka igihe kitaragera.Ibi bizatuma hatangwa raporo yagenderwaho mukugabanya no gukumira kuvuka kwabana mbereyigihe cyateganyijwe, bityo abana benshi bakajya babasha kuvukira igihe,bikagabanya umubare wabana bapfa cyane cyane abapfa biturutse ko bavutse mbere yigihe cyateganyijwe.

Ingaruka cgangwa imbogamizi mu bushakashatsi.

Inkurikizi kuri wowe numwana wawe muri ububushakashatsi ni nkeya cyane. Mugihe cyubushashatsi uzapimwa umuzenguruko wukuboko,ariko ntago bibangamye,ntanicyo byagutwara.

Inyemezabushake

- Nasobanuriwe ubushakashatsi mu rurimi numva neza. Ibibazo byose nari nfite birebana n'ubushakashatsi byasubijwe mu buryo bwumvikana. Nsobanukiwe uko biri bugende n'uruhare rwanjye.

- Namenyeshejwe ko ari uburenganzira bwanjye kwanga kugira uruhare muri ubu bushakashatsi kandi ko niba mpisemo kwanga ntagomba gutanga impamvu, kandi ko bitazahungabanya uburyo ngomba kwitabwaho ubu cyangwa mu gihe kizaza.

- Namenyeshejwe ko amakuru ntanga azagirwa ibanga rikomeye: izina ryanjye ntirizakoreshwa cyangwa amakuru yose ashobora gukoreshwa mu kumenya mu bushakashatsi.

- Nasomye amakuru yatanzwe hejuru,cyangwa nasomewe amakuru yatanzwe hejuru.Nahawe umwanya wo kubaza ibibazo narimfite kandi nahawe ibisubizo binyuze.Nemeye kubushake kugira uruhare muri ububushakashatsi.Nshobora gukuraho amasezerano igihe icyo aricyo cyose,ndetse no guhagarika uruhare rwanjye ntakurikizi muguhabwa servisi zubuvuzi..

- Niba wemeye kugira uruhare muri ububushakashatsi, urasinya hepfo hakurikira,
  Izina ryuwagize uruhare mubushakashatsi:
  Umukono /Igikumwe (cy') w'uwagize uruhare mubushakashatsi:

Itariki: umunsi/ukwezi/umwaka:

Izina ryumushakashatsi/Izina ryuri mwitsinda ryubushakashatsi:

Umukono wumushakashatsi/Umukono wuri mwitsinda ryubushakashatsi:

Itariki : umunsi/ukwezi/umwaka:

umushakashatsi:

RM Immaculee MUKANDEPANDASI Postgraduate student, Public Health Department
University of Rwanda

Abagenzuzi:

1. Dr. J. Paul SEMASAKA, Lecturer, Department of Epidemiology and Biostatistics, School of Public Health, College of Medicine and Health Sciences, University of Rwanda

2. Dr. Sabine MUSANGE, Lecturer, Department of Health Policy, Economics and Management, School of Public Health, College of Medicine and Health Sciences, University of Rwanda

ANNEXE 5. ETHICAL APPROVAL

UNIVERSITY of RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

DIRECTORATE OF RESEARCH & INNOVATION

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 19th/07/2019

Immaculee MUKANDEPANDASI
School of Public Health, CMHS, UR

Approval Notice: No 354/CMHS IRB/2019

Your Project Title ***"Prevalence and Risk Factors Associated With Preterm Birth at Nyamata District Hospital"*** has been evaluated by CMHS Institutional Review Board.

		Involved in the decision		
			No (Reason)	
Name of Members	**Institute**	Yes	**Absent**	**Withdrawn from the proceeding**
Prof Kato J. Njunwa	UR-CMHS	X		
Prof Jean Bosco Gahutu	UR-CMHS	X		
Dr Brenda Asiimwe-Kateera	UR-CMHS	X		
Prof Ntaganira Joseph	UR-CMHS	X		
Dr Tumusiime K. David	UR-CMHS	X		
Dr Kayonga N. Egide	UR-CMHS	X		
Mr Kanyoni Maurice	UR-CMHS		X	
Prof Munyanshongore Cyprien	UR-CMHS	X		
Mrs Ruzindana Landrine	Kicukiro district		X	
Dr Gishoma Darius	UR-CMHS	X		
Dr Donatilla Mukamana	UR-CMHS	X		
Prof Kyamanywa Patrick	UR-CMHS		X	
Prof Condo Umutesi Jeannine	UR-CMHS		X	
Dr Nyirazinyoye Laetitia	UR-CMHS	X		
Dr Nkeramihigo Emmanuel	UR-CMHS		X	
Sr Maliboli Marie Josee	CHUK	X		
Dr Mudenge Charles	Centre Psycho-Social	X		

After reviewing your protocol during the IRB meeting of where quorum was met and revisions made on the advice of the CMHS IRB submitted on 19th July 2019, **Approval has been granted to your study.**
Please note that approval of the protocol and consent form is valid for **12 months**.

You are responsible for fulfilling the following requirements:

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

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

Sincerely,

Date of Approval: The 19th July 2019

Expiration date: The 19th July 2020

Professor GAHUTU Jean Bosco
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR

Cc:

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

REPUBLIQUE DU RWANDA

19th July 2019

ADEPR

HOPITAL NYAMATA
BP : 7112 Kigali
Tél : 0788130100
e-mail : nyamata.hospital@moh.gov.rw

REF N° HN……. /2019

Dear: **Immaculee MUKANDEPANDASI**

RE: Approval of conducting research project

After reviewing your research proposal entitled "**Prevalence and risk factors associated with preterm birth at Nyamata Hospital",** required for completion of your Postgraduate studies; the Nyamata Hospital Ethics Committee has decided to give you permission to continue research procedures.

The Ethics Committee finally recommends you to:

a. Ensure if consent forms are signed before interview and administration of questionnaires to the participants
b. Ensure confidentiality of individual information
c. Submit a final copy of your research findings after completion of the study
d. Consult Nyamata Hospital administration in case you need to publish the findings.

Wish you all the best,

Dr Cyrille NTAHOMPAGAZE

Chair Person of Ethics Committee

Approved by **Dr William RUTAGENGWA**

Director General of Nyamata Hospital