

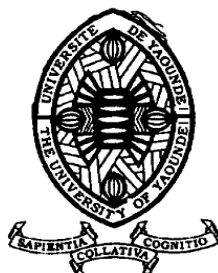
REPUBLIC OF CAMEROON

Peace-Work-Fatherland

MINISTRY OF HIGHER EDUCATION

THE UNIVERSITY OF YAOUNDE I

FACULTY OF MEDICINE AND
BIOMEDICAL SCIENCES



REPUBLIQUE DU CAMEROUN

Paix-Travail-Patrie

MINISTERE DE L'ENSEIGNEMENT
SUPERIEUR

UNIVERSITE DE YAOUNDE I

FACULTE DE MEDECINE ET DES
SCIENCES BIOMEDICALES

DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

Effects of *Triumfetta species* consumption on postpartum evolution in the Yaoundé Gynaeco- Obstetric and Pediatric Hospital

Thesis written and defended publicly in partial fulfilment for award of doctor in medicine degree
by:

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Matricule: **17M081**

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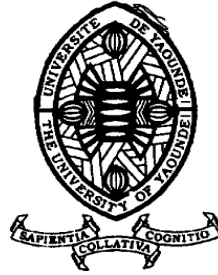
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DEDICATION

I dedicate this work to:

My mother

**FORLEMU PASCALINE
EFEUMENTSE**

And grandmother

KOFETE JOAN

ACKNOWLEDGEMENTS

- To God Almighty for giving me the strength, favour and success throughout my years of training and for always seeing me through every challenge. During this work, for being a provider to all my needs.
- To Pr. DOHBIT Julius SAMA, I am forever grateful for having you as a supervisor and a mentor. For pushing me towards something new and challenging, for always expecting the best at all times, for guiding and correcting me to achieving the best results.
- To Dr. NDOUMBA NKENGUE Annick, for accepting to co-direct this work. For your dedication, understanding and constructive guidance towards the realization of this work.
- To Dr. FOUMANE MANIEPI Saurelle, you have been there from the start of this study. Thank you for always creating time to read and correct my work, for your unwavering support and assistance throughout this work.
- To the president and honourable members of the jury in charge of reviewing my work, your contribution and corrections will be noted to the improvement of our work.
- To Pr. ZE MINKANDE, the Dean of the Faculty of Medicine and Biomedical Sciences (FMBS), I am thankful for the teachings and guidance given to us throughout our studies.
- To the Administrative and the Teaching Staff of FMBS as a whole, your teachings and endeavour made me the doctor I am today. I am thankful and a proud laureate of this wonderful institution.
- To Pr. MBU ENOW Robinson, general director of the Yaoundé Gynaeco-Obstetric and Pediatric Hospital, for accepting us in your prestigious institution to carry out our study.
- To the staff of the Yaoundé Gynaeco-Obstetric and Pediatric Hospital, who were welcoming and accommodating, thus providing a conducive atmosphere for the research.
- To all the patients who gave their consent to participate in this research. Thank you for sacrificing your time, trust and participation towards the realization of this work.
- To Pr. NNANGA NGA Emmanuel, head of department of galenical pharmacy and pharmaceutical legislation, for giving always opening their door to me during the period of this study.
- To Dr SOPPO LOBE, for reviewing and correcting my work.

- To Dr Nkengazem Nerry and Dr Mrs. Nkengazem Solange, for guiding and supporting me towards achieving and expressing the best of myself
- To engineer Tiku Fabrice and Dr Mrs. Tiku Noella, for spiritual, moral and academic guidance.
- To Dr Forlemu Fabiola, for constantly supporting me in all endeavours throughout my studies, for constantly criticizing this work for the better.
- To Dr Bate Antuan, Dr Mneimoh Hesten, Dr Ngong Agrippa, and all my seniors for always answering to me and offering advice.
- To Yuh Bethilda, Ngimoh Maryqueen, Vachala Emmanuel, Emelda Ghea. Thank you for reading and editing this work.
- To my friends and classmates of the 49th promotion, most especially; Leyuga Senka'a, Fondzewong Larissa, Joel Mbouda, Meniemoh Ranebel, Nkotuh Emmanuel, Sake Jolie Coeur, Thom Claude, it has been a wonderful experience going through this training with you, thank you.
- To my bothers; Forlemu Cyril, Forlemu Philip and Forlemu Idris. Your immense advice and support led to this achievement.
- To the Victory Church Worldwide family, thank you for being a platform of spiritual, moral and academic growth.
- To the Bilingual Bible Club family, who have been a beacon of support throughout this training, always providing guidance at every step and through every challenge.
- To Chief Forlemu Robert, head of the Forlemu family, for unwavering support throughout my studies to the completion of this work.
- To the entire Forlemu family, who have been an emotional, a financial and moral support.
- To my beloved uncles and aunties of the Tamoyim family, your help and support is greatly appreciated.
- To all those other names not mentioned, who have in one way or the other contributed to the accomplishment of this work, my heartfelt appreciation goes out to you.

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KEY

- **HOD**= Head of Department
- **P**= Professor
- **AP**= Associate Professor
- **SL**= Senior Lecturer
- **L**= Lecturer

THE PHYSICIAN'S OATH

Declaration of Geneva adopted by the Geneva assembly of the World Medical Association in Geneva, Switzerland September 1948 and amended by the 22nd World Medical Assembly Sydney, Australia (August 1968)

I solemnly pledge myself to consecrate my life to the service of humanity.

I will give to my teachers the respect gratitude, which is their due.

I will practice my profession with conscience and dignity.

The health of my patient will be my first consideration.

I will respect the secrets that are confided in me even after the patient has died.

I will maintain by all means in my power, the honor and tradition of the medical profession.

My Colleagues will be my brothers.

I will not permit consideration of religion, nationality, race, political parties or social standing to intervene between my duty and my patient.

I will maintain the utmost respect for human life from the time of conception, even under threat.

SUMMARY

Introduction: The postpartum period is the period after delivery of conceptus when maternal physiological and anatomical changes return to the nonpregnant state up to 6 weeks. It is characterised by most maternal complications, including death. The most common complications are; anaemia, haemorrhage, preeclampsia, and endometritis. Our local pharmacopeia has been proven to be rich in substances that have medicinal virtues. One of these substances is *Triumfetta species* (*sp.*), commonly called Nkui. It has been shown to have uterotonic effects during pregnancy, and is often used to induce contractions.

Objective: We opted to study therefore, the benefits associated with this cultural practice of Nkui consumption during pregnancy and the postpartum period.

Methods: We conducted a 5-month prospective cohort study at the Yaoundé Gynaeco-Obstetric and Pediatric Hospital. Women in postpartum who gave birth at term were included in our study. We identified and compared postpartum outcomes (anaemia, haemorrhage, preeclampsia, endometritis, and mastitis) among 115 women who consumed *Triumfetta sp.* and 115 women who did not consume in the postpartum period. Using a logistic regression model, we investigated the association between *Triumfetta species* consumption and postpartum outcome. We considered p-values <0.05 to be statistically significant.

Results: Analysis showed that the consumption of *Triumfetta species* was inversely associated with the occurrence of postpartum haemorrhage (p=0.086, OR=0.81, 95% CI=0.29-2.29), preeclampsia (p=0.286, OR=0.62, 95% CI=0.22-1.49), endometritis (p=0.486, OR=0.89, 95% CI=0.39-1.20), and mastitis (p=0.774, OR=0.55, 95% CI=0.23-1.89), implying that the more *Triumfetta species* was consumed, the lower the odds of occurrence of these complications. Meanwhile, the consumption of *Triumfetta species* increases the odds of postpartum anaemia (p=0.849, OR=1.06, 95% CI=0.58-1.94). However, none of these associations was statistically significant.

Conclusion: The consumption of *Triumfetta species* has a protective effect on the occurrence of postpartum complications (anaemia, haemorrhage, preeclampsia, endometritis, and mastitis).

Keywords: Postpartum; *Triumfetta species*; anaemia, haemorrhage, preeclampsia

RÉSUMÉ

Introduction : La période du post-partum est la période qui suit l'expulsion du produit de conception et au cours de laquelle les changements physiologiques et anatomiques de la mère reviennent à l'état de non-grossesse. Elle se caractérise par la plupart des complications maternelles, y compris le décès. Notre pharmacopée locale s'est révélée riche en substances aux vertus médicinales. L'une de ces substances est l'espèce *Triumfetta*. Il a été démontré qu'elle possède des propriétés utéro toniques, comme c'est souvent le cas pour induire les contractions.

Objectif : Nous avons choisi d'étudier les bénéfices associés à cette pratique culturelle de consommation de Nkui pendant la grossesse et la période de post-partum

Méthodes : Nous avons mené une étude cohorte prospective de 5 mois à l'Hôpital Gynéco-Obstétrique et Pédiatrique de Yaoundé. Les femmes en post-partum ayant accouché à terme ont été incluses dans notre étude. Nous avons identifié et comparé l'évolution du post-partum entre 115 femmes ayant consommé et 115 femmes n'ayant pas consommé du *Triumfetta*. En utilisant un modèle de régression logistique, nous avons étudié l'association entre la consommation d'espèces *Triumfetta* et l'issue du post-partum. Nous avons considéré que des valeurs de $p < 0,05$ étaient statistiquement significatives.

Résultats : L'analyse a montré que la consommation de la plante du genre *Triumfetta* était inversement associée à la survenue d'hémorragie du post-partum ($p=0,086$, OR=0,81, 95% IC=0,29-2,29), de la pré-éclampsie ($p=0,286$, OR=0,62, 95% CI=0,22-1,49), de l'endométrite ($p=0,486$, OR=0,89, 95% CI=0,39-1,20), et de la mastite ($p=0,774$, OR=0,55, 95% CI=0,23-1,89), ce qui implique que plus la plante du genre *Triumfetta* était consommée, plus les probabilités d'apparition de ces complications étaient faibles. Par ailleurs, la consommation de *Triumfetta* augmente le risque d'anémie du post-partum ($p=0,849$, OR=1,06, 95% CI=0,58-1,94). Aucune de ces associations n'était toutefois statistiquement significative.

Conclusion : La consommation d'espèces *Triumfetta* a un effet protecteur sur l'apparition des complications du post-partum.

Mots-Clés : Post-partum, espèces *Triumfetta*, anémie, hémorragie, pré-éclampsie.

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LIST OF ABBREVIATIONS

ANC: Antenatal Consultation

BMI: Body Mass Index

CPN: Consultation Prénatale

ENT: Ear, Nose and Throat

HELLP: Hemolysis, Elevated Liver Enzymes, Low Platelet count

HIV: Human Immuno-Deficiency Virus

IVF: In Vitro Fertilization

MAP: Menace d'Accouchement Prématuro

MB: Maternal Blues

PPA: Postpartum Anemia

PPB: Postpartum Blues

PPD: Postpartum Depression

PPH: Postpartum Hemorrhage

PPT: Postpartum Thyroiditis

RPM: Rupture Prématuro des Membranes

***Triumfetta sp.* :** *Triumfetta species*

UTI: Urinary Tract Infection

VTE: Venous Thrombo-Embolic

WHO: World Health Organization

YGOPH: Yaoundé Gynaeco -Obstetric and Pediatric Hospital

CHAPTER I : INTRODUCTION

I.1. BACKGROUND

Postpartum is the period after delivery of conceptus when maternal physiological and anatomical changes return to the non-pregnant state. It is also known as puerperium, starts following the expulsion of the placenta until complete physiological recovery of various organ systems. The Puerperium divides into three arbitrary phases; i.e., acute phase - the first 24 hours after delivery of the placenta, early – up to 7 days, and late – up to 6 weeks to 6 months for certain pathologies. [1]

Obstetric and non-obstetric postpartum complications are a considerable source of morbidity and mortality in women of reproductive age. The spectrum of postpartum complications ranges from relatively self-limiting to life-threatening conditions that can be divided into six categories: infectious conditions (endometritis), thrombo-embolic complications (deep vein thrombosis, ovarian vein thrombophlebitis), HELLP (haemolysis, elevated liver enzymes, and low platelet count) syndrome, haemorrhagic conditions (uterine atony, trauma of the lower portion of the genital tract, retained products of conception, uterine artery arteriovenous malformations, or uterine artery pseudo aneurysm), caesarean delivery-related complications (bladder flap hematoma, sub fascial hematoma, rectus sheath hematoma, abscess formation, uterine dehiscence, uterine rupture, vesicovaginal fistula, or abdominal wall endometriosis), iatrogenic conditions (uterine perforation), and non-obstetric complications (acute cholecystitis, acute appendicitis, uterine fibroid degeneration, renal cortical necrosis, pyelonephritis). [2]

From time immemorial, humans have relied on medicinal plants to fight diseases and solve diverse health needs. According to the World Health Organization, about 80% of the world's population relies on medicinal plants for their primary health care needs. [3]

In a study in an obstetrics and gynaecology unit in a tertiary hospital in Ghana, about 50% of patients had used herbal medicine prior to admission. It was found that use of herbal medicine was associated with low education and skill levels. In a Nigerian city, researchers reported that pregnant women used both traditional herbal medicine and pharmaceutical drugs, with the highest prevalence of concomitant use among nulliparous mothers. [4] Up to 80% of pregnant African women in Africa and the diaspora use traditional medicine (TM) to treat pregnancy related

symptoms. According to a study conducted in 2012 in Cameroon, 31.02% of women use TM based on plants during the second half of pregnancy to improve its health state. [5]

In Cameroon, the “Grassfield” people of Western Cameroon are known for their high reproductive rate. *Triumfetta species* “Nkui” is a traditional food highly consumed, especially by women in the last trimester of pregnancy to facilitate delivery and 3–5 months after delivery to prevent postpartum haemorrhage. [6] *Triumfetta species* among others is used for the following related ailments (with principal route of administration being oral at 98.5%); venereal disease, female infertility, painful menstruation (dysmenorrhea), vaginal cleansing, postpartum hemorrhage, stimulating lactation, cleansing a womb after giving birth, inflammation of the uterus, postpartum pain and preventing abortion. [7]

I.2. STATEMENT OF RESEARCH PROBLEM

According to a study done by Dohbit et al in 2019, 23.7% of their participants reported using *Triumfetta species* and attested of its effectiveness in easing delivery. [5]

Due to the frequency of occurrence of postpartum complications in our context, we sort out to see the effects of consumption of *Triumfetta species* in the evolution of postpartum. Given that we could not find similar studies done in our context, our findings would therefore serve as a baseline data, and inform policies that will regulate consumption of *Triumfetta species*.

I.3. RESEARCH QUESTION

What are the effects of *Triumfetta species* consumption on postpartum evolution?

I.4. RESEARCH HYPOTHESIS

The consumption of *Triumfetta species* has a positive impact on postpartum evolution

I.5. OBJECTIVES

I.5.1. General objective

To study effects of *Triumfetta species* consumption on postpartum evolution

I.5.2. Specific objectives

1. To determine the sociodemographic and obstetric characteristics of the study participants.
2. To identify and compare the occurrence of postpartum complications among women who consumed *Triumfetta species* and those who did not consume.
3. To establish the relationship between postpartum evolution and *Triumfetta species* consumption.

I.6. Definition of key words

- *Triumfetta species*: It is a medicinal plant from the Malvaceae family. It is found in many regions of Cameroon, locally known as Nkui, mainly consumed by the grassfield people.
- Postpartum: The period following the expulsion of the foetus and placenta till 6 weeks.

CHAPTER II : LITERATURE REVIEW

II.1. DEFINITION

The postpartum period is the period after delivery of conceptus when maternal physiological and anatomical changes return to the non-pregnant state. The postpartum period, also known as puerperium, starts following the expulsion of the placenta until complete physiological recovery of various organ systems. The postpartum period divides into three arbitrary phases; i.e., acute phase - the first 24 hours after delivery of the placenta, early – up to 7 days, and late – up to 6 weeks to 6 months for certain pathologies. [1]

II.2. PHYSIOLOGY OF POST PARTUM

There is generalized physical fatigue immediately after delivery. The pulse rate may be elevated a few hours after childbirth due to excitement or pain and usually normalizes on the second day. The blood pressure could be elevated due to pain or excitement but is generally in the normal range. A significant decrease ($> 20\%$ below baseline) in blood pressure could be a sign of postpartum haemorrhage or septic shock. The temperature is slightly elevated up to 37.2C (99F) along with increased shivering, sweating, or diaphoresis in the first 24 hours and normalizes within 12 hours. The respiratory rate also begins to fall back to the pre-pregnancy level within 2 to 3 days. There is a weight loss of 5 to 6 kg due to the expulsion of products of gestation and accompanying blood loss. [1]

II.2.1. REPRODUCTIVE SYSTEM

II.2.1.1. Uterine Involution

During the postpartum period, the uterus, which weighs over 1 kg immediately after parturition, undergoes a physiological involution and returns to the non-pregnant condition. The process of involution, which is one of the main characteristics of the postpartum period, may be affected in pathological conditions such as uterine infection and haemorrhage. Both are main causes of maternal death worldwide; therefore, a correct diagnosis is of paramount importance. [8]

II.2.1.2. Uterus

The physiological puerperium period is still not fully investigated. A number of ultrasound studies focus on puerperium and describe the changes detected in the size, the shape, the position, and the texture of the uterus. [9]

After delivery, the withdrawal of oestrogen and progesterone leads to an increase in the activity of uterine collagenase and other proteolytic enzymes, accelerating the process of autolysis. The intima and elastic tissues in the uterine blood vessels also undergo fibrosis and hyaline degeneration, leading to infarction and shedding of more uterine cells, which are removed by macrophages. The superficial and basal layers of the endometrium become necrotic and sloughed. The endometrium is usually fully restored within 2 to 3 weeks. [1]

II.2.1.3. Lochia

The lochia is the vaginal discharge that originates from the uterus, cervix, and vagina. The lochia is initially rubra (red) and comprised of blood and fragments of decidua, endometrial tissues, and mucus and lasts from the 1st to the 4th day. The lochia then changes colour to serosa (yellowish or pale brown), lasting from the 5th to the 9th day, and is comprised mainly of blood, mucus, and leucocytes. Finally, the lochia is alba (white) and contains mostly mucus, lasting from the 10th to the 14th day. [10]

II.2.2. LACTATION

Colostrum is a breast milk produced after the birth of the new-born and lasts for 2-4 days. Colostrum is very important part of breast milk and lays down the immune system and confers growth factors and other protective factors for the young ones in mammals. This is the source of passive immunity achieved by the mother and is transferred to the baby. This is the major source of secretory IgA and gives protection against gastrointestinal infections. [11]

The high levels of oestrogen and progesterone during pregnancy make the breast tissue unresponsive to prolactin. Still, as their levels decrease following childbirth, the prolactin begins its milk secretory activity in mammary glands. The lacto genesis or milk secretion starts the third or fourth day postpartum. The neural arch of lactation involves ascending afferent impulses from

nipple and areola, activated by suckling or stimulation of nipples, which pass via thoracic sensory nerves to the paraventricular and supraoptic nuclei of the hypothalamus, promoting the synthesis and secretion of Oxytocin from the posterior pituitary. Oxytocin affects the contraction of myoepithelial cells, leading to galactokinesis or milk expression from the mammary ducts. This release is also known as "milk ejection," or milk let down reflex." The milk ejection reflex can be inhibited by pain, anxiety, depression or breast engorgement. A healthy mother secretes 500-800 ml of milk per day, which requires 700kcal/ day. The fat stores of up to 5 kg gained during pregnancy can provide enough calories to make up for any nutritional deficit during lactation. [1]

II.2.3. URINARY

Genitourinary changes following childbirth and pregnancy are common, and include urinary and anal incontinence, pelvic pain, sexual dysfunction, and pelvic organ prolapse. At present, it is unclear whether or not these changes are a result of the pregnancy itself or the mode of delivery (caesarean section or vaginal birth). [12]

II.3. POST PARTUM CARE

The postpartum period begins soon after the baby's delivery and usually lasts six to eight weeks and ends when the mother's body has nearly returned to its pre-pregnant state. The weeks following birth lay the foundation of long-term health and well-being for both the woman and her infant. Therefore, it is critical to establish a reliable postpartum (afterbirth) period that should be tailored into on-going, continuous, comprehensive care. Most maternal and infant deaths occur in the first month after birth. Hence effective postpartum care is mandatory to improve both short-term and long-term health consequences of mother and new-born. [13]

The World Health Organization (WHO) has care guidelines for the first six weeks postpartum in low resource settings. The guidelines discuss timing and content of postpartum visits based on recommendations in the literature. The WHO recommends that every mother and baby should have at least four postpartum visits within the first six weeks regardless of birth setting: 1) within the first 24 hours; 2) day 3 (48–72 hours); 3) between days 7–14; and 4) at six weeks postpartum. [14]

The five topics primarily covered in postpartum care interventions were: preventive care and counselling, health systems innovation, family planning, universal health coverage, and health literacy and education. There is the need to incorporate more preventive care and counselling in addition to what is already being provided, including: exclusive breastfeeding; cord care; emotional wellbeing and postpartum depression screening; signs and symptoms of domestic abuse; resumption of sexual intercourse; maternal health warning signs (e.g. postpartum haemorrhage, pre-eclampsia, infection and thromboembolism); nutrition; hygiene; family planning; iron and folic acid supplementation; and psychosocial support. [15]

II.4. POST PARTUM COMPLICATIONS

Childbirth is the most common cause for hospitalization, and caesarean delivery is the most performed inpatient surgery. After delivery, mothers are at risk of short- and long-term complications that can impact their well-being for example, after caesarean delivery, approximately 10% of women experience postpartum depression and persistent pain. The WHO has developed a list of 121 health conditions “attributed to and/or complicating pregnancy and childbirth” that include both minor and life-threatening issues, such as perineal pain, incontinence, and mastitis. [16]

II.4.1. POST PARTUM ANEMIA

II.4.1.1. Definition

Normal peripartum blood losses are approximately 300 ml, but haemorrhage >500 ml occur in 5–6% of the women. In healthy women after normal delivery, the prevalence of anaemia (haemoglobin <110 g/L) 1 week postpartum is 14% in iron-supplemented women and 24% in non-supplemented women. In consecutive series of European women, the prevalence of anaemia 48 h after delivery is approximately 50%. In developing countries, the prevalence of postpartum anaemia is in the range of 50–80%. Postpartum anaemia is associated with an impaired quality of life, reduced cognitive abilities, emotional instability, and depression and constitutes a significant health problem in women of reproductive age. [17]

II.4.1.2. Epidemiology

Anaemia affects 56 million or 38% of pregnant women globally; pregnancy anaemia is an independent risk factor for postpartum anaemia (PPA) as iron stores tend to remain low for several months after childbirth. Globally, anaemia affects about 29% of non-pregnant women, and PPA affects 10-30% of mothers in developed countries and 50-80% of mothers in less developed countries. [18]

II.4.1.3. Risk Factors

Predelivery anaemia and postpartum haemorrhage are presumed to confer the greatest risks to women for postpartum anaemia. [19]

Other risk factors of PPA include;

- Deficiencies of Vitamin A and B12, riboflavin, and folate
- Young maternal age
- Inadequate antenatal care visits.
- Type of birth
- Poor adherence to iron and folic acid supplementation in pregnancy. [18]

II.4.1.4. Clinical Presentation

- Anorexia
- Asthenia
- Palpitations
- Nausea
- Vomiting
- Vertigo
- Headache
- Tachycardia
- Pallor
- Depressive symptoms
- Impaired immune function. [20]

II.4.1.5. Management

For mild to moderate anaemia, it is recommended to start iron supplementation immediately after delivery till 6 weeks postpartum. In cases of severe anaemia, haemoglobin level less than 6-8g/dl, blood transfusion is the recommended line of treatment. [19]

II.4.2. POST PARTUM HAEMORRRHAGE

II.4.2.1. Definition

The traditional definition of postpartum haemorrhage (PPH) is blood loss of more than 500 ml after a vaginal delivery or more than 1000 ml after a caesarean delivery. More recently, PPH has been redefined as a cumulative blood loss of 1000 ml or more of blood loss associated with signs or symptoms of hypovolemia, irrespective of the route of delivery. [21]

II.4.2.2. Epidemiology

The incidence of postpartum haemorrhage ranges from 3 to 8%, and the increasing rate is a growing public concern. Severe postpartum haemorrhage (SPPH) is the leading cause of maternal deaths and severe maternal morbidities, accounting for 27.1% of maternal deaths worldwide, ranging from 8% in developed areas to 32% in Northern Africa. [22]

II.4.2.3. Risk Factors

The risk factors include;

- Maternal age < 18 years
- Previous caesarean section
- History of PPH
- Conception through IVF
- Pre-delivery anaemia
- Stillbirth
- Prolonged labour
- Placenta praevia
- Placental abruption
- Placenta accrete spectrum
- Macrosomia. [22]

II.4.2.4. Causes

Postpartum haemorrhage is considered to be primary when it occurs within the first 24 hours after delivery and secondary when it occurs between 24 hours and up to 12 weeks after delivery. The causes of postpartum haemorrhage can be summarized by the four “T’s”;

- Tone (uterine atony)
- Trauma; lacerations, uterine rupture and uterine inversion
- Tissue; retained tissues, invasive placenta, and
- Thrombin; coagulopathy/clotting-factor deficiency.

The most common cause is uterine atony (accounting for approximately 70% of cases), followed by obstetrical lacerations (approximately 20%), retained placental tissue (approximately 10%), and clotting-factor deficiencies (<1%). [21]

II.4.2.5. Complications

Immediate and late complications of primary postpartum haemorrhage include;

- Hypovolemic shock
- Cerebral anoxia
- Renal failure
- Anaemia
- Puerperal sepsis
- Sheehan's syndrome. [23]

II.4.2.6. Prevention

Postpartum haemorrhage is common and can occur in patients without risk factors for haemorrhage.

- Active management of the third stage of labour should be used routinely to reduce its incidence.
- Use of oxytocin after delivery is the most important and effective component of this practice.
- Routine episiotomy should be avoided to decrease blood loss and the risk of anal laceration. [24]

II.4.3. PREECLAMPSIA/ECLAMPSIA

II.4.3.1. Definition

Pre-eclampsia was defined as a blood pressure greater than 140/90 mmHg on two occasions six hours apart and proteinuria greater than 2+ on dipstick or greater than 300 mg in 24 hour urine collection, supplemented by clinical symptoms and lab test results such as HELLP (haemolysis, elevated liver enzymes, and low platelet count), thrombocytopenia, renal insufficiency, impaired liver function, pulmonary oedema, cerebral or visual symptoms, and elevated uric acid levels, in the absence of proteinuria. [25]

II.4.3.2. Epidemiology

Pre-eclampsia (PE) complicates 2–5% of all pregnancies and is a leading cause of maternal and neonatal mortality and morbidity. PE and eclampsia are estimated to be responsible for approximately 14% of maternal death. PE is also associated with later-life cardiovascular disease among women and their offspring. [26]

II.4.3.3. Risk Factors

- Family history of pre-eclampsia
- Previous placental abruption
- Previous intrauterine foetal growth restriction
- History of stillbirth
- Nulliparity
- Multiple pregnancy
- Advanced maternal age
- In vitro fertilization
- Maternal comorbidities including; diabetes mellitus, chronic hypertension, obesity, chronic kidney disease, history of acute kidney injury or systemic lupus erythematosus
- Molar pregnancies. [27]

II.4.3.4. Management

Treatment is largely symptomatic

- Antihypertensive drugs (labetalol, nifedipine, methyldopa, enalapril) are mandatory for very high blood pressure

- Magnesium sulphate can prevent and control eclamptic seizures. For preeclampsia, it more than halves the risk of eclampsia and reduces the risk of maternal death. Magnesium sulphate is the anticonvulsant of choice for treating eclampsia. [28]

II.4.3.5. Complications

- HELLP syndrome
- Acute kidney injury
- Pulmonary oedema
- Ischemic heart disease
- Stroke. [29]

II.4.4. PUERPERAL INFECTIONS

Accurate assessment of the epidemiology of postpartum infections has been hampered by the limitations of surveillance systems for identifying these infections, particularly infections detected after hospital discharge. The use of inpatient and ambulatory surveillance methods revealed that postpartum infections requiring medical attention were common following both vaginal delivery (5.5%) and caesarean section (7.4%). [30]

II.4.4.1. ENDOMETRITIS

II.4.4.1.1. Definition

Endometritis is defined as an infection or inflammation of the endometrium. The normal endometrium does not harbour any microorganisms, but microbes from the cervix and vagina can ascend upwards and lead to inflammation and infection of the endometrium. Acute endometritis is the symptomatic acute inflammation of the endometrium, which upon examination with a microscope shows micro-abscess. Chronic endometritis is a silent disease usually diagnosed on the workup of secondary amenorrhea and infertility. [31]

II.4.4.1.2. Epidemiology

Caesarean delivery, the most common maternal surgical procedure is the greatest risk factor for puerperal maternal infections. It is associated with at least a 5 to 10 fold increase in risk for postpartum (surgical site) infections including endometritis and wound infection. [32]

II.4.4.1.3. Risk Factors

- Caesarean birth
- Chorioamnionitis
- Prolonged labour
- Prolonged rupture of membranes
- Internal foetal or uterine monitoring
- Large amounts of meconium in amniotic fluid
- Manual removal of the placenta
- Maternal diabetes mellitus or severe anaemia
- Low socioeconomic status
- HIV infection[33]

II.4.4.1.4. Causes

Aerobic bacteria

Group A Streptococci

Group B Streptococci

Staphylococcus

Escherichia coli

Klebsiella pneumoniae

Enterococcus

Anaerobic Bacteria

Pepto streptococcus

Pepto coccus

Bacteroides

Prevotella

Clostridium

Aerobic and anaerobic bacteria causing acute endometritis. [31]

II.4.4.1.5. Clinical Presentation

In most patients with postpartum endometritis, the key clinical findings are:

- Fever
- Uterine tenderness
- Tachycardia that parallels the rise in temperature
- Midline lower abdominal pain
- Sub involution of the uterus
- Malodorous purulent lochia.

II.4.4.1.6. Management

Apart from symptomatic management, rest, adequate hydration and antibiotics need to be started immediately through the intravenous route (Ceftriaxone, Clindamycin, Gentamicin, Cefotaxime) for the first 48 hours, followed by oral antibiotics (Doxycycline, Metronidazole, Probenecid) in cases of severe infection; otherwise, oral antibiotics should be given to patients with mild to moderate disease. Simultaneously, sexual partner/s need to be treated and advised on use of barrier contraceptives. [34]

II.4.4.2. URINARY TRACT INFECTION (UTI)

II.4.4.2.1. Definition

Urinary Tract Infection (UTI) is described as the microbial invasion of any tissues of the urinary tract and is the second most common clinical symptom for experimental antimicrobial treatment in primary and secondary care. Normally, the urinary tract is sterile, but urinary tract infections can be caused by a variety of conditions. They can cause complicated or uncomplicated, symptomatic or asymptomatic infections. Anatomically can be divided into upper and lower tract infections. [35]

II.4.4.2.2. Epidemiology

Urinary tract infections (UTIs) are some of the most common bacterial infections, affecting 150 million people each year worldwide. In 2007, in the United States alone, there were an estimated 10.5 million office visits for UTI symptoms (constituting 0.9% of all ambulatory visits) and 2–3 million emergency department visits. Currently, the societal costs of these infections, including health care costs and time missed from work, are approximately US\$3.5 billion per year in the United States alone. UTIs are a significant cause of morbidity in infant boys, older men and females of all ages. [36]

II.4.4.2.3. Risk Factors

- Changes in bacterial flora
- Behavioural factors
- Diabetes
- Hypertension
- History of UTIs during childhood or family history of UTIs
- Genetic predisposition (blood group). [37]

II.4.4.2.4. Causes

Most infections arise from:

- *Escherichia coli*
- *Klebsiella pneumoniae*

- Streptococcus species
- Proteus mirabilis
- Staphylococcus saprophyticus
- Enterococcus faecalis
- Pseudomonas aeruginosa
- Candida spp. [38]

II.4.4.2.5. Management

Recommended first-line treatment include: trimethoprim-sulfamethoxazole, ampicillin, nitrofurantoin for 5 days. Second line agents include fluoroquinolones (levofloxacin/ciprofloxacin) for 3 days. Beta-lactams (amoxicillin-clavulanate, cefdinir, cefaclor) for 7 days is also recommended as second line treatment. [39]

II.4.4.3. LACTATIONAL MASTITIS

II.4.4.3.1. Definition

Lactational mastitis is defined as inflammation of the breast tissue and is commonly experienced by breastfeeding women. [40]

II.4.4.3.2. Epidemiology

Population-based studies in Australia, where breastfeeding initiation is over 80% and about 50% of women are breastfeeding at six months postpartum, have reported an incidence of mastitis in 15–20% of women in the six months postpartum. Slightly fewer than 10% of American women experienced mastitis in three months postpartum in a large cohort study. [41]

II.4.4.3.3. Risk factors

- Incorrect breastfeeding technique
- Stress
- Lack of sleep. [42]

II.4.4.3.4. Clinical Presentation

- Pain
- Fever ($>38.4^{\circ}\text{C}$) and aching limbs
- Rapid pulse
- Local redness, warmth and tender areas of the breast, usually unilateral
- Breast engorgement. [43]

II.4.4.3.5. Management

Consist mainly of;

- Intensified emptying of the breast by breastfeeding every 2 hours
- Manual expression of milk
- Simple analgesics (paracetamol/Ibuprofen) are suitable for relief of general symptoms
- In the case of stillbirth or absence of foetus, bromocriptine is prescribed to the women. [44]

II.4.4.4. VENOUS THROMBOEMBOLISM

II.4.4.4.1. Definition

Pregnancy and the postpartum period are times of hypercoagulability, increasing the risk of pulmonary embolism. [45]

II.4.4.4.2. Epidemiology

Postpartum venous thromboembolism (VTE) results in significant morbidity and mortality[46]

The incidence of pregnancy-associated VTEs is indicated at approx. 0.12%; in comparison to non-pregnant women of the same age, pregnant women thus have per se an approximately 4–5 times higher risk of VTE. The increased risk of thrombosis begins with the start of pregnancy, persists during pregnancy (or further increases throughout the course of the pregnancy) and reaches its maximum in the postpartum period. [47]

II.4.4.4.3. Risk factors

- Caesarean section
- Maternal age >35 years
- Multiple pregnancy
- Hypertensive disorder of pregnancy
- Parity ≥ 3
- Lupus erythematosus
- Preterm birth
- Peripartum bleeding
- Immobilization
- Obesity BMI $\geq 30\text{kg/m}^2$. [33]

II.4.4.4.4. Management

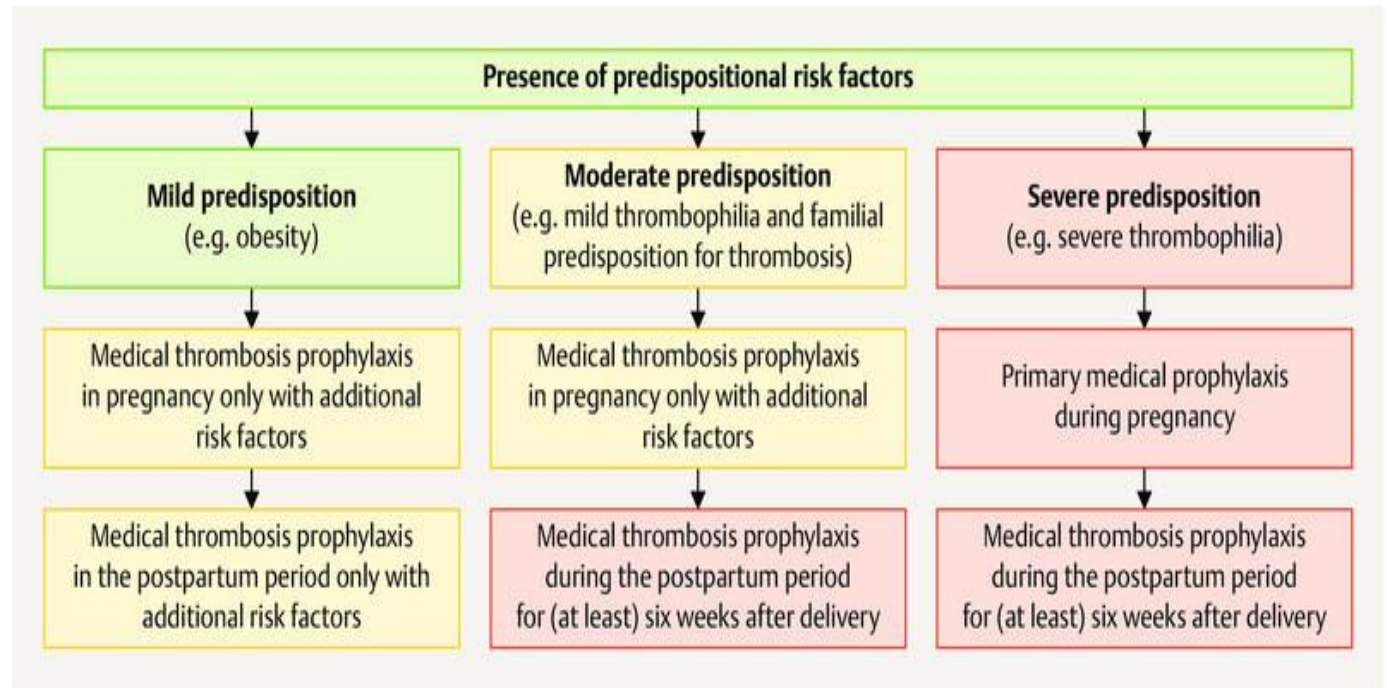


Figure 1: prophylaxis of thrombotic events

As a general principle, medical thrombosis prophylaxis started during pregnancy is generally continued for about six weeks following delivery due to the risk of thrombosis which peaks during the postpartum period. If a Caesarean section is performed during delivery, there should be a period of at least 12 hours between the last heparin administration and delivery. [47]

II.4.5. ENDOCRINE DISORDER

Endocrine disorders in the puerperium often go undetected or are misinterpreted as postpartum depression. The most common disorders include postpartum thyroiditis (PPT). PPT is an autoimmune-mediated destructive thyroiditis, occurring in the postpartum period of transient hyperthyroidism, then followed by a period of transient hypothyroidism. [48]

The prevalence of PPT varies dramatically, ranging from 1.1 to 16.7%. Explanations for the variation include differences in study design (in particular the frequency and duration of screening postpartum), whether or not screening was initiated during pregnancy or began postpartum, differences in how PPT was defined, and inherent geographical differences. [49]

Characteristic features include symptoms of transient hyperthyroidism, such as tremor, nervousness, tachycardia, and hyperhidrosis, potentially progressing in later stages to lack of drive and extreme fatigue as symptoms of hypothyroidism. PPT is more common in patients with type I diabetes mellitus (incidence, 10.5–25%). It is also strongly associated with the presence of anti-thyroid peroxidase (anti-TPO) antibodies. [33]

II.4.6. PSYCHIATRIC DISORDERS

Depression, a change in the affective domain that describes mental and emotional conditions, most often occurs in general population especially during postpartum period. Changes in mental and emotional conditions take place from an early phase after birth (postpartum blues) and put mothers at risk of beginning in the early stage with postpartum blues and progressing with time to postpartum depression and psychosis. 80% of new mothers experience postpartum blues, and 10-15% of those cases progress to postpartum depression. [50]

II.4.6.1. Maternal blues

Maternity blues (MB), also known as baby blues, postnatal blues, or post-partum blues, include low mood and mild, transient, self-limited depressive symptoms, which can be developed in the first days after delivery. In a recent systematic review and meta-analysis, among included studies, a prevalence of 39%, ranging from 13.7% to 76%, has been reported. Highlighting the greatest prevalence in Africa at 49.6%. MB has been shown to constitute a specific risk factor for the occurrence of post-partum depression (PPD), postpartum psychosis (PP) and irrecoverable emotional and cognitive PPD impairment for women and their neonates. [51]

In India, the occurrence rate of PPB is in the range of 50–60% and the prevalence of PPB in this study is found to be 58.5%. Globally, about 60–80% of all new mothers suffer from the PPB which rarely requires medication and normally subsides with support and education. It is significant to carry out the follow-up, because up to 20% of these mothers are likely to progress to PPD and an adverse consequence on children's cognitive growth. [52]

Local community and family values that prioritize one sex of children over the other can significantly trigger domestic violence and influence behaviour involving rejecting the presence of babies. Other traditional behaviours in caring for mothers after childbirth include restricted activities, staying at home for a month, or forbidding certain foods. Such restrictions can exert an influence on mothers' emotions, especially in terms of interacting with their baby, causing them to blame the baby for such restrictions. Cultural tradition was another factor that some researchers found could trigger depression and bonding attachment failure. [50]

II.4.6.2. Psychosis

The term postpartum psychosis is traditionally used to describe severe episodes of mood disorder that have very sudden onset after childbirth, usually within the first two weeks. While more than 40% of women affected by postpartum psychosis have no history of severe psychiatric illness, the remainder present with a recurrence of a pre-existing psychiatric illness, predominantly of a psychotic or mood disorder. It is characterized by the onset of mania or a mixed mood episode, yet depression, lability of mood, perplexity (extreme confusion) and anxiety. [53]

The onset of postpartum psychosis was found to be increased in cases of;

- Longer mean length of hospital stay (7.4 days vs. 3.5 days)
- Total dystocia (occurring in 14% in postpartum psychosis)
- Night-time delivery (occurring in 71% of women with puerperal psychosis). [54]

II.5. MEDICINAL PLANTS

From time immemorial, humans have relied on medicinal plants to fight diseases and provide for diverse health needs. Medicinal plants refer to a variety of plants that have medicinal characteristics. According to the World Health Organization (WHO), about 80% of the world's population relies on medicinal plants for their primary health care needs. [3]

In a study in an obstetrics and gynaecology unit in a tertiary hospital in Ghana, about 50% of patients had used herbal medicine prior to admission. It was found that use of herbal medicine was associated with low education and skill levels. In a Nigerian city, researchers reported that pregnant women used both traditional herbal medicine and pharmaceutical drugs, with the highest prevalence of concomitant use among nulliparous mothers. [4]

In Cameroon, like in many other African countries, 80% of the population uses traditional medicine based on plants to improve its health state. This reliance on medicinal plants can be explained partly by the high cost of allopathic drugs and inaccessibility of modern health institutions, but also by the cultural acceptability of the traditional system. [7]

The African pharmacopoeia thus provides plants used for preventing and/or treating gynaecological infections during or after their reproductive life, during pregnancy, or following parturition. Such plants have been assessed as estrogenic, oxytocic, antimicrobial, anti-inflammatory effects. We are still at an early stage in the phytochemical and pharmacological characterization of these medicinal plants that affect the female reproductive system. [55]

Table I: types of traditional medicine

Traditional Medicine	Number (%)	Most reported reason
Honey	28.2%	Ease labour
<i>Triumfetta pentandra</i> A. (Nkui)	23.7%	Ease delivery
Hibiscus leaves (<i>Hibiscus rosa-sinensis</i>)	20%	Ease delivery
Brimstone tree leaves (<i>Morinda lucida</i>)	17.7%	Induce labour
Lemon grass (<i>Cymbopogon citratus</i>)	11.4%	Ease labour
Wild mango (<i>Irvingia gabonensis</i>)	10%	Manage constipation
Benth barks (<i>Vernonia conferta</i>)	3.4%	Relieve chronic pelvic pain

Major types of traditional medicine used among pregnant women is displayed in the table above. Several women reported using a combination of different TM. [5]

II.5.1. TRIUMFETTA SPECIES

Studies show that the most the species of *Triumfetta* used to facilitate delivery are mostly: *Triumfetta cordifolia*, *Triumfetta rhomdofolia* and *Triumfetta pentandra*. They are used because of their uterotonic properties. [56]

Table II: taxonomy of *Triumfetta species*

Kingdom	Plantae
Phylum	Tracheophyta
Class	Magnoliopsida
Order	Malvales
Family	Malvaceae
Genus	<i>Triumfetta</i>
Species	<i>Triumfetta cordifolia</i> <i>Triumfetta pentandra</i> <i>Triumfetta rhomdofolia</i>



Figure 2: *Triumfetta pentandra* plant (Forlemu Verra, May 2024, Yaoundé)

Triumfetta pentandra are bast fibers from the West (equatorial) region of Cameroon. Phytochemical analysis revealed that the fibers were made up of several elementary fibers cross the whole section, which were composed of celluloses (61.10%), hemicelluloses (14.30%), lignins (17.73%), pectins (5.65%), and other extracts (0.86%). Also, the fibers exhibit significant thermal stability up to 220°C with a peak thermal decomposition of cellulose located at 380°C. [57]

Qualitative phytochemical analysis revealed the presence of alkaloids, phenolic compounds and terpenoids in the extracts of *Triumfetta sp.* The contents in total phenolic compounds were 113.68, flavonoid contents were 16.47µg ECAT/mg, saponins were 62% and the calcium content was 385 mg/L. [58]

Linalool, the most abundant alcohol is a terpene alcohol which occurs in plants, spices, tree barks and possess anti-inflammatory and chemo protective activity. Its presence in *Triumfetta sp.* could possibly be linked to the therapeutic and estrogenic use of the soup for lactating mothers in Cameroon, as demonstrated in an in vivo study by Tchoupang *et al.* in 2016. [59]

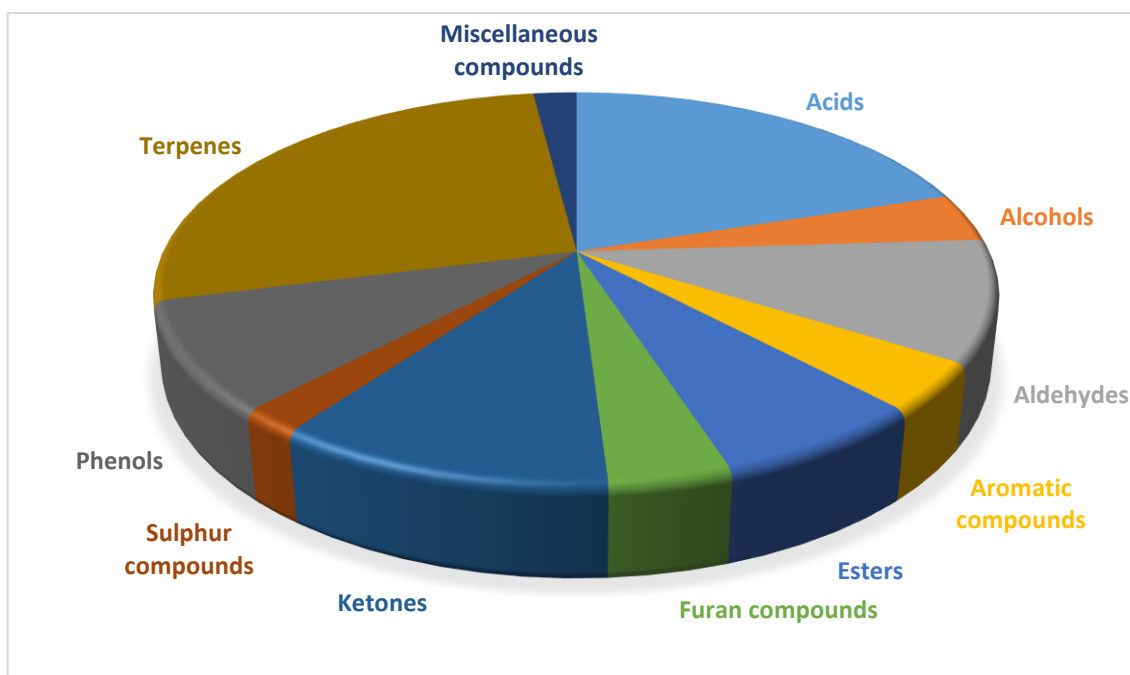


Figure 3: percentage representation of the flavours in *Triumfetta species*. [59]

Triumfetta species, among others is used for the following related ailments (with principal route of administration being oral at 98.5%); venereal disease, female infertility, painful menstruation (dysmenorrhea), vaginal cleansing, postpartum haemorrhage, stimulating lactation, cleansing a womb after giving birth and preventing abortion. [7]

II.6. REVIEW OF PUBLICATIONS

II.6.1. In Africa

Authors and Year of study	Title and place of study	Results
Mudonhi N, Nunu WN, 2021	Traditional medicine utilisation and maternal complications during antenatal care among women in Bulilima, Plumtree, Zimbabwe	Complications were reported by (51) 29% of the women who were under study. The proportion of women who developed complications was higher in those that did not use traditional medicine as compared to those that used traditional medicine (30 and 26% respectively). In a generalised assessment, women who did not use traditional medicine contributed a significantly higher proportion of complications as compared to those that utilised traditional medicine.
Kekana LS, Sebitloane MH, 2020	Ingestion of herbal medication during pregnancy and adverse perinatal outcomes Durban, South Africa	Two hundred and ninety-nine women were interviewed. The prevalence of herbal medication use was 33.7% (n=101), mainly via the oral route. Fifty-eight (57.4%) of these women used herbal medication throughout their pregnancy. Reasons given for herbal ingestion included general well-being, or to make labour easier or come sooner. There was a high rate of caesarean delivery among pregnant women who used herbal medication compared with those who did not (79.2% v. 52.8%; p=0.001). One hundred and eighteen women had meconium-stained liquor; 59% of the herbal medication users compared with 29.6% of the non-users (p<0.001) comprised this group.

		The perinatal mortality rate was also higher among users ($p<0.04$). there were no maternal deaths
Tadase M, Dagne K, Wubetu AD, Abeway S, Bekele A, Kebede WM, Mulu GB, 2022	Assessment of the adverse pregnancy outcomes and its associated factors among deliveries at Debre Berhan Comprehensive Specialized Hospital, Northeast Ethiopia	In this study, the magnitude of adverse pregnancy outcomes was 28.3%, 95% CI (25.7–30.9). The most frequently recorded obstetric complications were obstructed labor (7.4%), retained placenta (5.3%), and hypertensive disorders of pregnancy (2.4%). Whereas stillbirths (10%), malpresentation (3%), and prematurity (2.3%) frequently occurred fetal/neonatal complications. There were 29 maternal deaths and the possible causes of death were obstructed labor (51.7%), hemorrhage (44.7%), eclampsia (24.1%), and sepsis (6.9%). Home delivery (AOR (CI = 4.12 (2.30–7.15) and low birth weight (AOR (CI = 1.63 (1.36–1.96) were significant associates of adverse pregnancy outcomes.
Shewamene Z, Dune T, Smith CA, 2017	The use of traditional medicine in maternity care among African women in Africa and the diaspora: a systematic review	A total of 20 studies conducted in 12 African countries representing 11,858 women were included.No literature was found on African women in the diaspora related to maternal use of TM or complementary and alternative medicine (CAM). The prevalence of TM use among the African women was as high as 80%. The most common TM used was herbal medicine for reasons related to treatment of pregnancy related symptoms. Frequent TM users were pregnant women with no formal education, low income, and living far from public health facilities. Lack of access to the mainstream maternity care was the major determining factor for use of TM.

II.6.2. In Cameroon

Authors and year of study	Title and place of study	Results
Dohbit JS, Meka E, Tochie JN, Ze MMK, Essiben F, Agbor VN, Nkeck JR, Foumane P, 2019	Exploring the effects of peri-partum ingestion of traditional medicine on maternal and foetal outcomes: a prospective cohort study	<p>We enrolled a total of 603 parturients of whom 147 in the exposed group and 456 in the non-exposed group.</p> <p>The most frequently used TM were honey and <i>Triumfetta pentandra</i> A.</p> <p>Ingestion of TM in the peri-paritum period was associated with intra-partum vaginal bleeding, dystocic labour, tachysystole and uterine atony.</p> <p>No adverse neonatal outcome was observed.</p> <p>Overall, these findings could help guide the direction of future research into the safety and potential benefits of peri-partum TM use, as well as serving as a preliminary reference for counselling.</p>
Foumane JM, Lobe VS, Ntsama JM, Mekoulou FM, Ngolsou F, Doboué PB, Obono P, Ndongo MN, Nga N, Minkande JZ, 2021	Plants used by women to facilitate childbirth: ethnobotanical survey of 125 women who gave birth in a maternity hospital in the City of Yaounde	<p>A total of 125 were included in the survey.</p> <p>47 species belonging to 30 botanical families were listed.</p> <p>The Malvaceae family was the most represented (41.3%) with the species <i>Triumfetta cordifolia</i>, locally called "Nkui", obtaining the highest frequency of citations.</p> <p>Leaves were the most used part with a percentage of 43%, followed by bark with 20%.</p> <p>Recipes were prepared 54.3% by crushing and 31.43% by decoction.</p> <p>Water was the only solvent used.</p> <p>The oral (52%) and rectal (48%) routes of administration were cited</p>

CHAPTER III : METHODOLOGY

III.1. TYPE OF STUDY

We carried out a prospective cohort study

III.2. PERIOD AND DURATION OF STUDY

This was a five months study that ran from January 2024 to May 2024.

III.3. STUDY SITE

Our study was conducted in the obstetric unit of the Yaoundé Gynaeco -obstetric and Pediatric Hospital (YGOPH).

III.3.1. Justification for the choice of study site

YGOPH is a first-class reference hospital in the health pyramid of the Cameroonian healthcare system. The Obstetrics and Gynaecology unit in this hospital has a qualified staff and an adequate technical platform for the optimal management of postpartum.

III.3.2. Description of the study site

YGOPH is one of the fruits of the Chinese-Cameroonian cooperation. It was born out of a desire by the Cameroon and Chinese governments to improve the healthcare system for women, mothers, and children in Cameroon. It was inaugurated on March 28, 2002. It is located in the Ngousso district in Yaoundé.

There is an administrative and financial department as well as a medical department which coordinates the different services. These services are: Gynaecology and Obstetrics, Paediatrics, Paediatric surgery, Anaesthesia and Resuscitation, Ophthalmology, Otolaryngology (ENT), Emergencies, Medical Imaging, Physiotherapy.

The Obstetrics and gynaecology service comprises three parts: the maternity ward, hospitalization rooms and outpatient consultation offices. The attendance rate at this hospital structure was 327,932 consultations (excluding emergencies), with 102,446 in gynaecology and obstetrics between 2008 and 2012. Statistics for the year 2019 show 2799 births (compared to 2721 in 2012) which 913 by caesarean section and 2252 by vaginal delivery.

III.4. STUDY POPULATION

III.4.1. Target population

Our study population consisted of all the women in the postpartum period at the YGOPH during our study period. We had two major groups of women, an exposed group, comprised of women who consumed *Triumfetta sp.* during pregnancy, labour, or in postpartum and non-exposed group, women who had not consumed *Triumfetta sp.* or any other form of traditional medicine during the pregnancy, labour and postpartum.

III.4.2. Inclusion criteria

III.4.2.1. Exposed Group

- Willingness to participate and term delivery
- Consumed *Triumfetta sp.* in any form at term and during labour

III.4.2.2. Non-exposed Group

- Willingness to participate and term delivery
- Had not consumed *Triumfetta sp.* during pregnancy, labour or in the postpartum period

III.4.3. Non-inclusion criteria

- Underlying pathology; hypertension, diabetes
- Immune suppressed women
- Women who consumed other forms of traditional medicine

III.4.4. Sampling

We carried out a consecutive recruitment, our sample size was calculated using the following formula;

$$N = \frac{1}{1-f} \left(\frac{2(Z\alpha + Z\beta) \times P(1-P)}{P0 - P1} \right)$$

Where,

N – Sample size

α – level of significance, 0.05

$Z\alpha$ – Value of normal distribution, it is a constant with value of 1.96

$$Z\beta - 1.28$$

P0 – prevalence of complications in women who don't consume *Triumfetta species*

P1- prevalence of complications in women who consume *Triumfetta species*

$$P = \frac{P0+P1}{2}$$

Hence, N = 54 participants

We therefore had a minimum of 54 participants per study group

III.5. STUDY TOOLS

III.5.1. Physical examination materials

- Questionnaires and data entry forms
- Gloves
- Thermometer
- Measuring tape
- Stethoscope
- Sphygmomanometer

III.5.2. Materials for laboratory testing

- Urine dipsticks
- Hemoglobinometer

III.5.3. Materials for data management

- Computer
- USB flash drive

III.6. PROCEDURE

Once the research protocol was validated by the supervisor of the thesis and authorized by the Ethics Committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé 1 for the acquisition of an ethical clearance. Administrative authorization was obtained from the general director of the YGOPH.

We then proceeded with the collection of data with the help of questionnaires, which included sociodemographic details, obstetric and medical history, clinical assessment and laboratory examinations

III.6.1. Laboratory techniques

An analysis of postpartum haemoglobin level of all participants was done with the use of the haemoglobinometer, and a urine dipstick used to record presence of proteinuria

III.6.2. Study Variables

- Socio-demographic profile
 - Age
 - Matrimonial status
 - Profession
 - Level of education
 - Region of origin
- Postpartum anaemia
 - Haemoglobin level (pre and postpartum)
 - Conjunctiva
 - Pulse
- Postpartum haemorrhage
 - Blood loss
 - Arterial blood pressure
 - Pulse
- Postpartum pre-eclampsia/eclampsia
 - Arterial blood pressure
 - Urine dipstick
- Postpartum endometritis
 - Lochia
 - Fundal height
 - Temperature
- Postpartum Mastitis
 - Breast
 - Temperature
- Outcome
 - Days of admission
 - Discharge/death

III.7. DATA ANALYSIS

Data were entered through Microsoft Excel spreadsheets, and subsequently analysed using Statistical Package for the Social Sciences, SPSS version 25. Our results were presented in the form of tables and figures. Continuous variables were summarized as means with standard deviation; categorical variables were expressed as percentages. We did a univariate and multivariate analysis. p -values < 0.05 were considered statistically significant

III.8. ETHNICAL CONSIDERATION

The research proposal and questionnaire were submitted to the Ethical Committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I and the National Ethic Committee for ethical evaluation and approval. Research authorization from the general director of the Yaoundé Gynaeco-Obstetric and pediatric Hospital was obtained. The identity and personal details of participants of the study was kept strictly confidential.

CHAPTER IV : RESULTS

IV.1. Generalities

Out of 262 women who enrolled in our study, 12 had hypertension, nine had diabetes, four had HIV, five had preeclampsia and two had gestational diabetes. Hence, 32 women were excluded in accordance to our exclusion criteria. This left us with 230 women in the study.

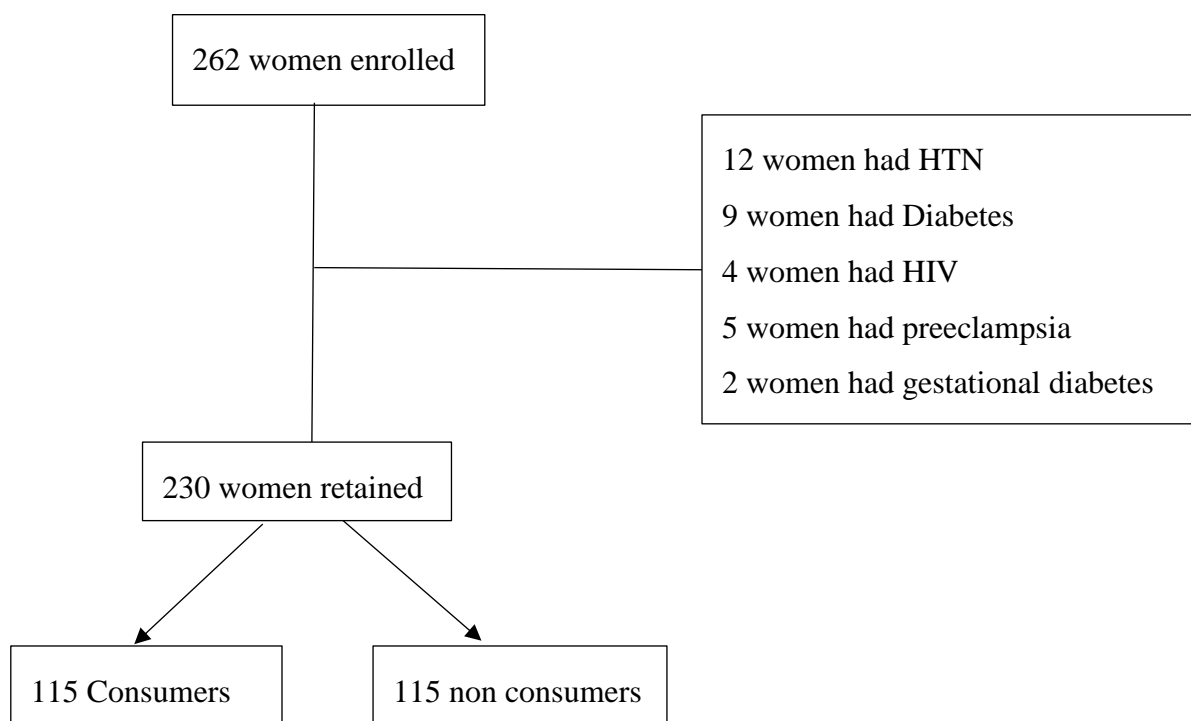


Figure 4: flowchart of participants

Among the 115 Consumers, 53.9% (62) women started consuming *Triumfetta sp.* during pregnancy, 13% (15) started during labour and 33.1% (38) only started in the postpartum.

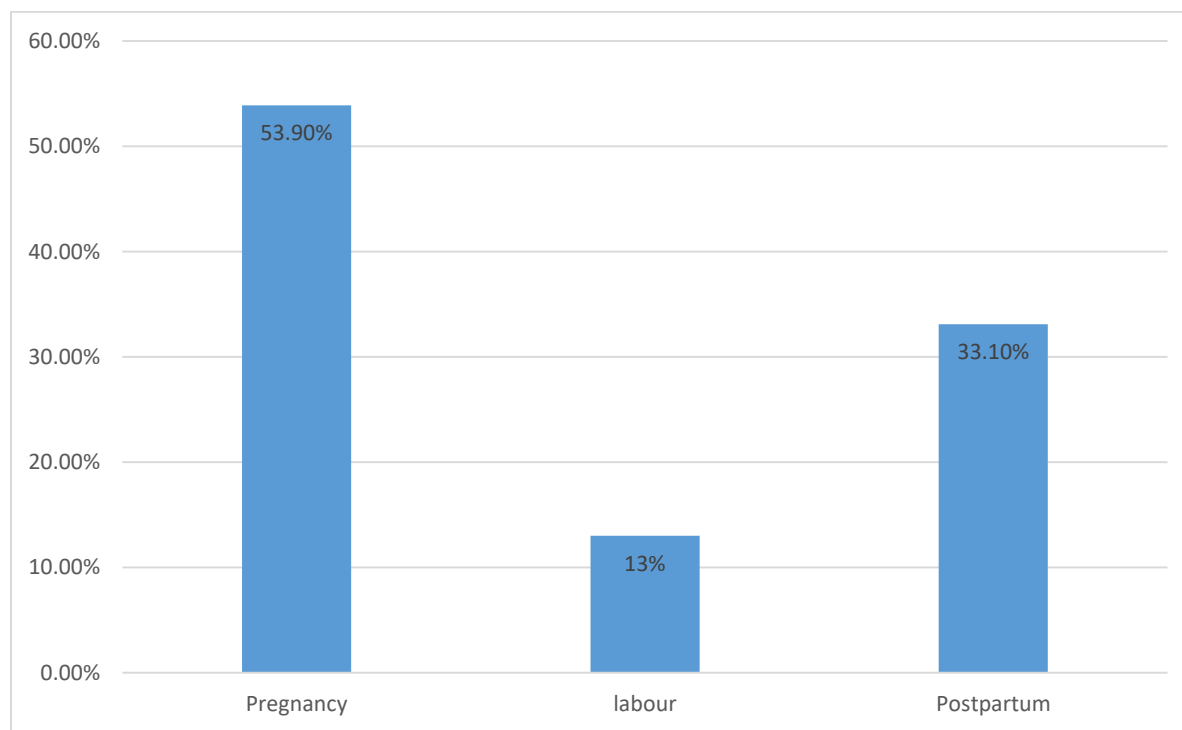


Figure 5: onset of *Triumfetta species* consumption

IV.2. Sociodemographic profile of study participants

IV.2.1. Age

The age of the study participants ranged from 17 to 44 years, with a mean age of 29.39 ± 6.046 years. Showing that majority of our participants were around the peak age of reproduction.

Table III: age of participants

Entity	Mean	Median	Standard deviation	Range	Minimum	Maximum
Value	29.39	29.00	6.046	27	17	44

IV.2.2. Matrimonial Status

It was observed that 53.3% of our participants were single, 45.7% were married and 0.4% were divorced

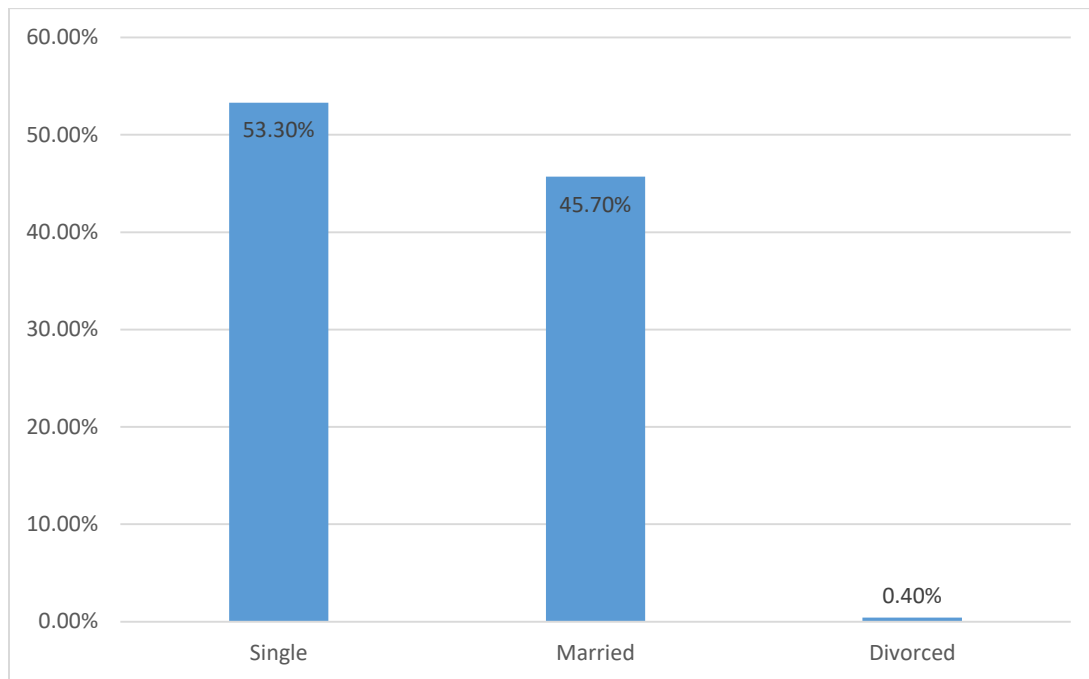


Figure 6: matrimonial status

IV.2.3. Level of education

The educational level of the participants was mostly secondary level, at 56.1%, followed by university at 28.3%, primary education at 15.2% and no education representing 0.4%.

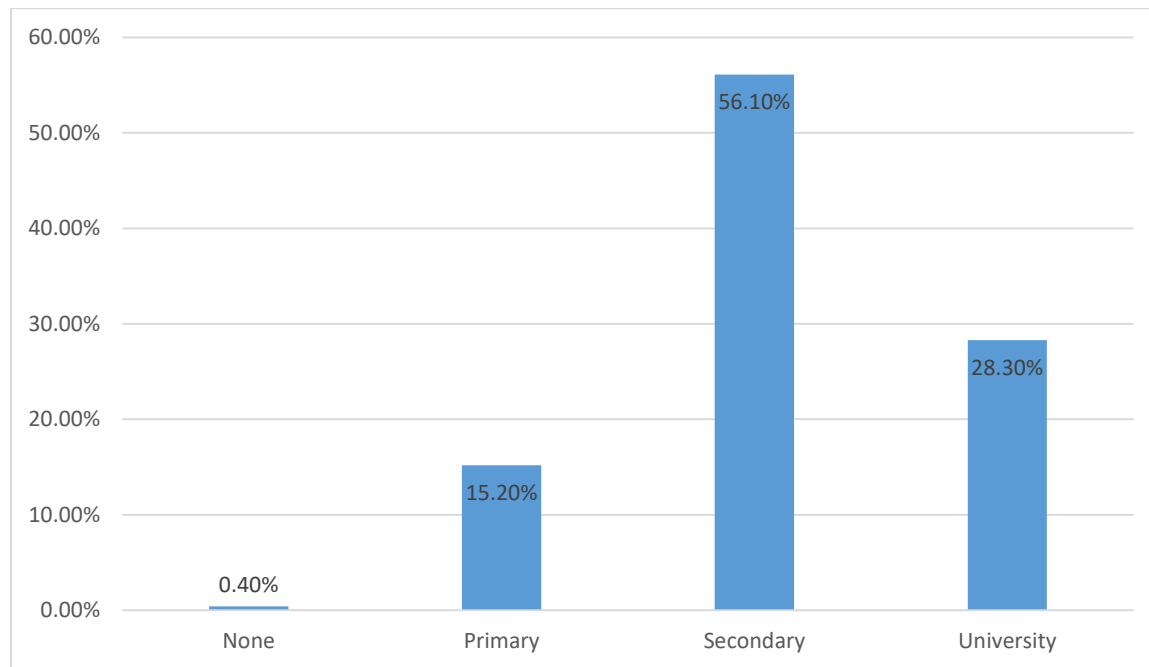


Figure 7: educational level

IV.2.4. Profession

It was observed that majority of the participants were housewives 47.0%, then we had students accounting for 19.1%, teachers accounting for 17.0% and other jobs covering 16.5%.

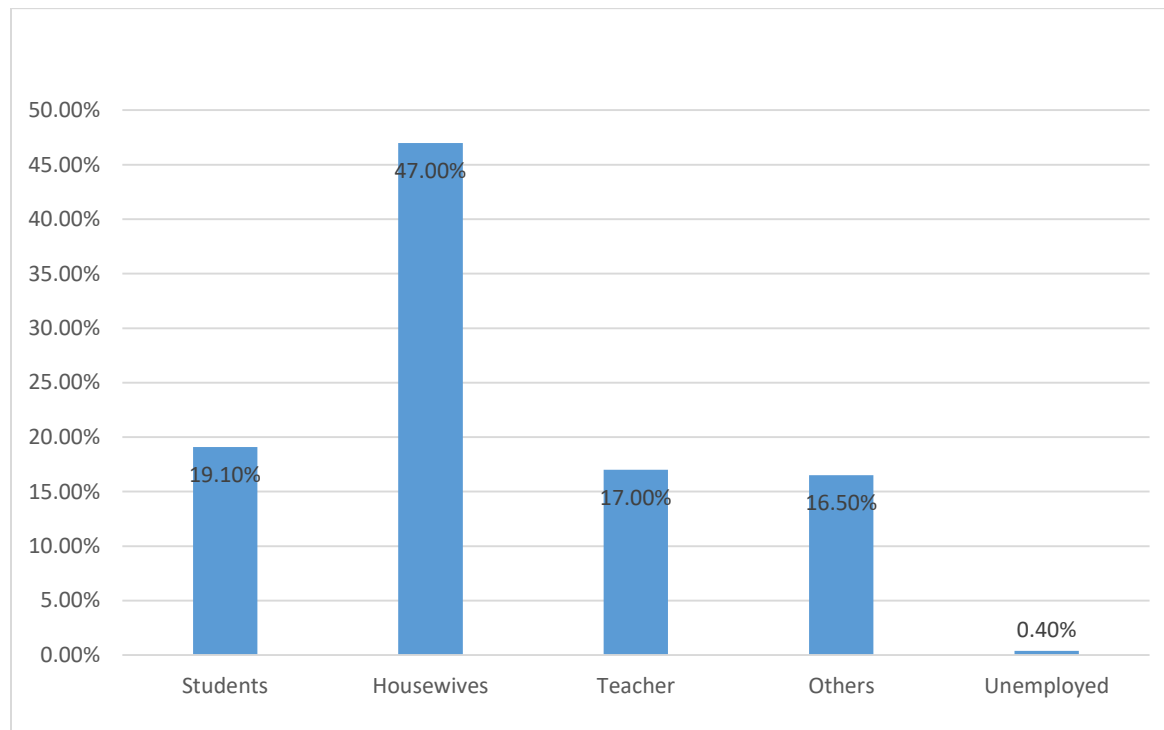


Figure 8: profession of the participants

IV.2.5. Region of origin

In our study, 42.6% of the participants were from the West region, followed by the Center region with 26.5%, the Littoral region with 10.0% and others.

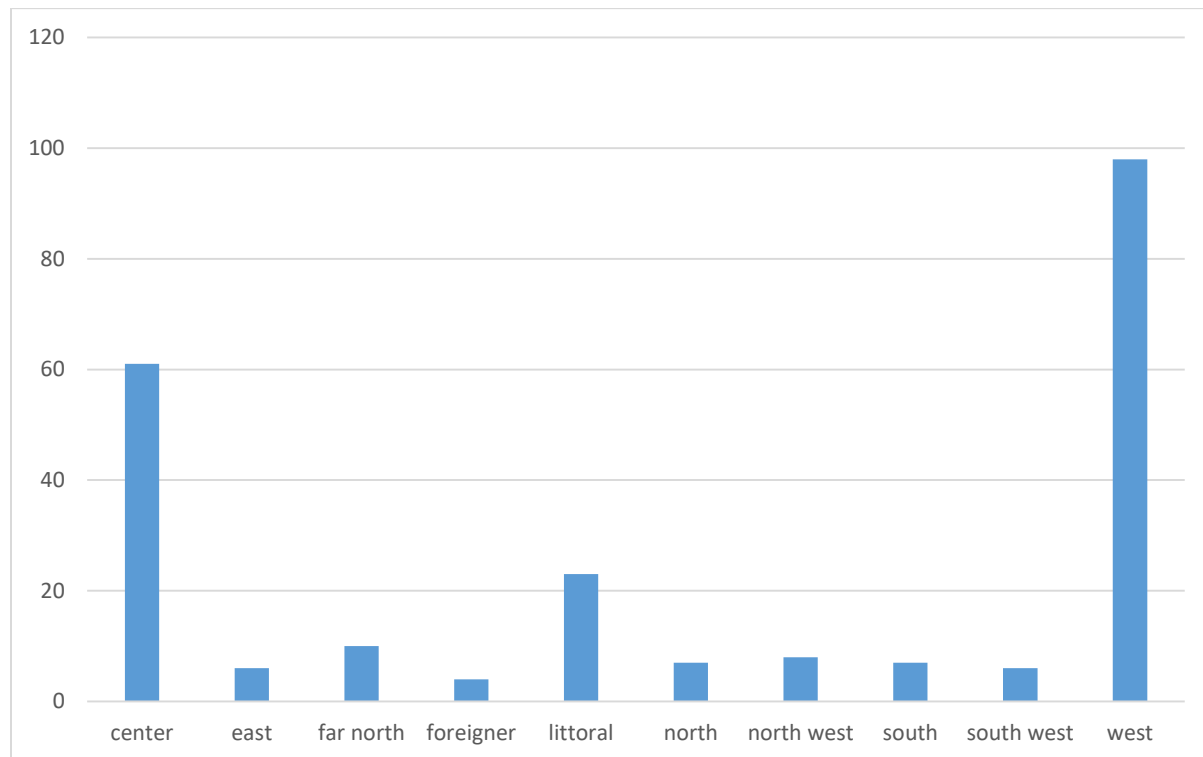


Figure 9: region of origin

It was observed that participants from the West and Center region were more inclined to *Triumfetta species* consumption than other regions who consumed little or no *Triumfetta sp.* at all.

Table IV: correlation between region of origin and *Triumfetta species* consumption

		<i>Triumfetta sp.</i> Consumption	
		No	Yes
Region of origin	Far North	10	0
	North	7	0
	East	6	0
	West	9	89
	Littoral	20	3
	South West	5	1
	North West	5	3
	Center	42	19
	South	7	0
	Foreigner	4	0

As shown in table V below, the most represented age group was 20-40 years with 93.9% in the exposed and 92.2% in the non-exposed group. Women were predominantly single in both groups, 53% and 54.8% in the exposed and the non-exposed groups respectively. Very few women in the non-exposed group (0.9%) were had no formal education. The most represented educational level among our participants was secondary level at 53% in the exposed and 59.1% non-exposed group. Majority of our participants were housewives, accounting for 37.4% in the exposed and 56.5% non-exposed group. Among these results, the profession of participants was statistically significant, meaning that consumption of *Triumfetta species* depended greatly on the occupation of these women.

Table V: summary of sociodemographic characteristics of participants

Variable	Exposed, N=115 (%)	Non-exposed N=115 (%)	P-value (p<0.05)
Age: Mean (SD)	28.13 (6.047)	30.65 (5.807)	0.319
Below 20 years	3 (2.6%)	7 (6.1%)	
20-40 years	108 (93.9%)	106 (92.2%)	
Above 40 years	4 (3.5%)	2 (1.7%)	
Matrimonial Status:			0.490
Single	61 (53.0%)	63 (54.8%)	
Married	53 (46.1%)	52 (45.2%)	
Divorced	1 (0.9%)	0 (0%)	
Education level:			0.196
None	0 (0%)	1 (0.9%)	
Primary	15 (13.1%)	20 (17.4%)	
Secondary	61 (53.0%)	68 (59.1%)	
University	39 (33.9%)	26 (22.6%)	

Effects of *Triumfetta species* consumption on postpartum evolution in the Yaoundé Gynaeco-Obstetric and Pediatric Hospital

Profession:			0.007*
Student	20 (17.4%)	24 (20.9%)	
Housewife	43 (37.4%)	65 (56.5%)	
Teacher	26 (22.6%)	13 (11.3%)	
Unemployed	1 (0.9%)	0 (0%)	
Others	25 (21.7%)	13 (11.3%)	

IV.3. Obstetric characteristics of participants

Most women had a gravidity of 3-5 in both groups with 53.9% in the exposed group and 51.3% in the non-exposed group. Similarly, women in both groups were predominantly multiparous (76.5% in the exposed and 71.3% in the non-exposed group). Also, 81.7% of women in the exposed group and 70.4% in the non-exposed group attended more than 5 antenatal consultations.

The most represented form of delivery among our participants was vaginal delivery at 62.6% in the exposed group and 51.3% in the non-exposed group.

It was also noted that the blood loss in these deliveries of more than 500cc in the exposed group was 4.3% and in the non-exposed group it was 9.6%. This result is significant, implying that the amount of blood loss during delivery is associated with the consumption of *Triumfetta species*.

Table VI: summary of Obstetric Characteristics of participants

Variable	Exposed N=115	Non-exposed N=115	P-value (p<0.05)	RR	95% CI
Gravida					
1-2	37 (32.2%)	42 (36.5%)	0.213	0.858	0.674 – 1.092
3-5	62 (53.9%)	59 (51.3%)	0.821	1.167	0.657 – 1.870
>6	16 (13.9%)	14 (12.2%)	0.320	0.696	0.862 – 1.089
Parity:					
Primiparous	27 (23.5%)	33 (28.7%)	0.368	1.222	0.789 – 1.894
Multiparous	88 (76.5%)	82 (71.3%)	0.453	0.932	0.799 – 1.087

Antenatal Consultation						
<5	21 (18.3%)	34 (29.6%)	0.094	0.630	0.176 1.157	–
>5	94 (81.7%)	81 (70.4%)	0.128	0.982	0.842 1.025	–
Method of delivery: N (%)						
Vaginal	72 (62.6%)	59 (51.3%)	0.083	0.819	0.653 1.029	–
Caesarean	43 (37.4%)	56 (48.7%)	0.110	1.302	0.963 1.761	–
Blood loss: N (%)						
<500cc	110 (95.7%)	104 (90.4%)	0.365	0.962	0.885 1.047	–
>500cc	5 (4.3%)	11 (9.6%)	0.048*	1.444	0.643 3.246	–

IV.4. Postpartum evolution

It was noted that consumption of *Triumfetta species* reduced the number of days of hospitalization post vaginal delivery. 81.9% of consumers were discharged after two days with respect to 76.3% among non-consumers, and up to 8.5% and 5.0% of non-consumers were only discharged after 5 and 6 days respectively.

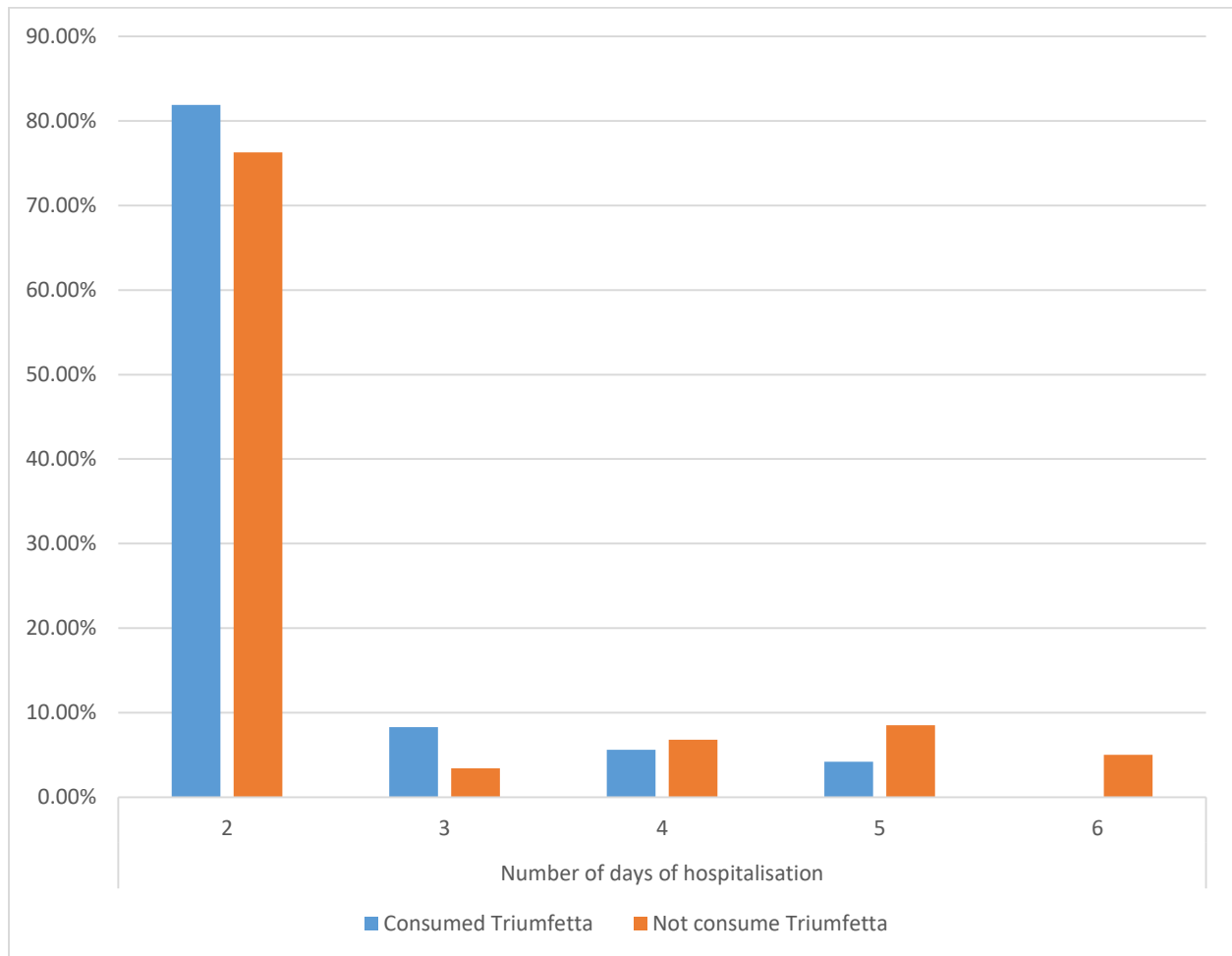


Figure 10: Correlation between hospitalization duration post vaginal delivery and consumption of *Triumfetta species*

The number of women discharged after 5 days post caesarean section was similar among consumers (62.8%) and non-consumers (62.5%) meanwhile majority of women who were hospitalized for more than 7 days were non consumers of *Triumfetta species*.

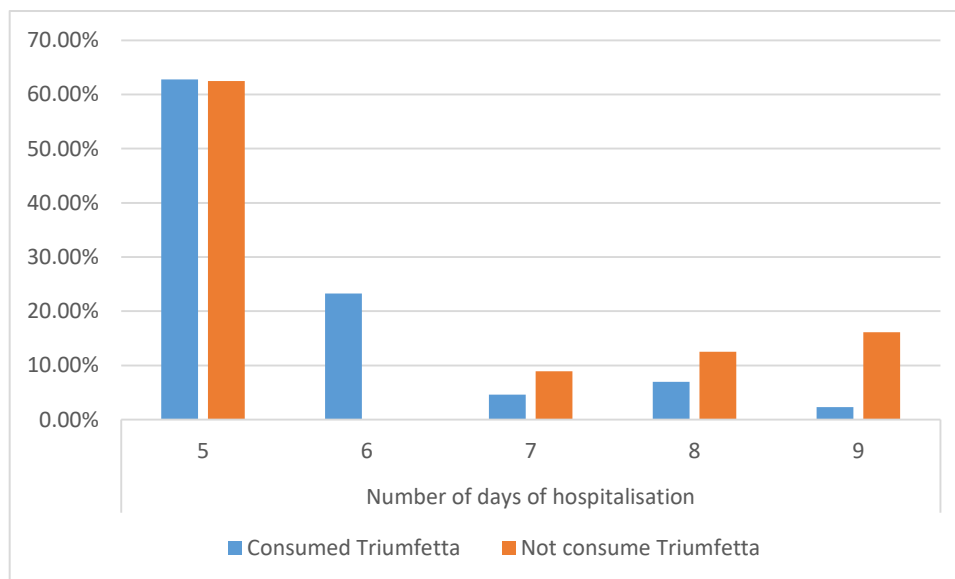


Figure 11: Correlation between hospitalization duration post caesarean section delivery and consumption of *Triumfetta species*

We determined and compared postpartum complications; anaemia, haemorrhage, preeclampsia/eclampsia, endometritis and mastitis between the groups of women who consumed *Triumfetta species* and those who did not consume. In this study, 84 (36.5%) of women developed at least one obstetric adverse outcome.

Table VII: comparison between complications and *Triumfetta species* consumption

Outcome	Exposed N=115 (%)	Non-exposed N=115 (%)	P-value (p<0.05)	RR
Anaemia	14 (12.2%)	19 (16.5%)	<0.001*	0.74
Haemorrhage	5 (4.3%)	11 (9.6%)	0.009*	0.45
Preeclampsia	9 (7.8%)	18 (15.7%)	<0.001*	0.5
Endometritis	5 (4.3%)	5 (4.3%)	0.092	1
Mastitis	7 (6.1%)	9 (7.8%)	<0.001*	0.78

The proportion of women who had complications was lower in women who consumed *Triumfetta species* (39.3%) as compared to those who did not consume *Triumfetta species* (60.7%)

We had a higher proportion of women with postpartum anaemia in women who did not consume *Triumfetta sp.*, 16.5% compared to women with anaemia who consumed *Triumfetta sp.* at 12.2%.

A significant difference is also noted in the case of postpartum haemorrhage with 4.3% in the exposed group and 9.6% in the non-exposed group.

The occurrence of postpartum preeclampsia doubles in women not exposed to *Triumfetta species* compared to consumers (15.7% vs 7.8%).

This was a similar case for postpartum mastitis, were women who consumed *Triumfetta species* made up 6.1% and those who did not consume made up 7.8%.

However, it was found that consumption of *Triumfetta sp.* had no association with the occurrence of postpartum endometritis.

It is observed that the method of delivery had impact on postpartum haemoglobin level. 36.4% of women who had anaemia gave birth vaginally while the other 63.6% gave birth through caesarean section.

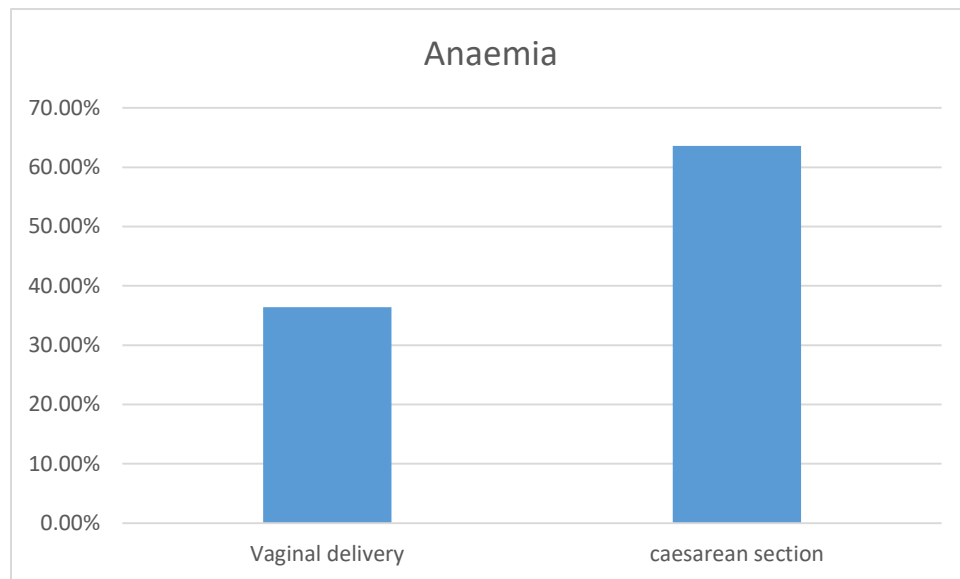


Figure 12: correlation between postpartum anaemia and method of delivery

The occurrence of postpartum endometritis is greatly depended on the method of delivery. 30% of the cases were attributed to vaginal delivery and 70% to caesarean delivery.

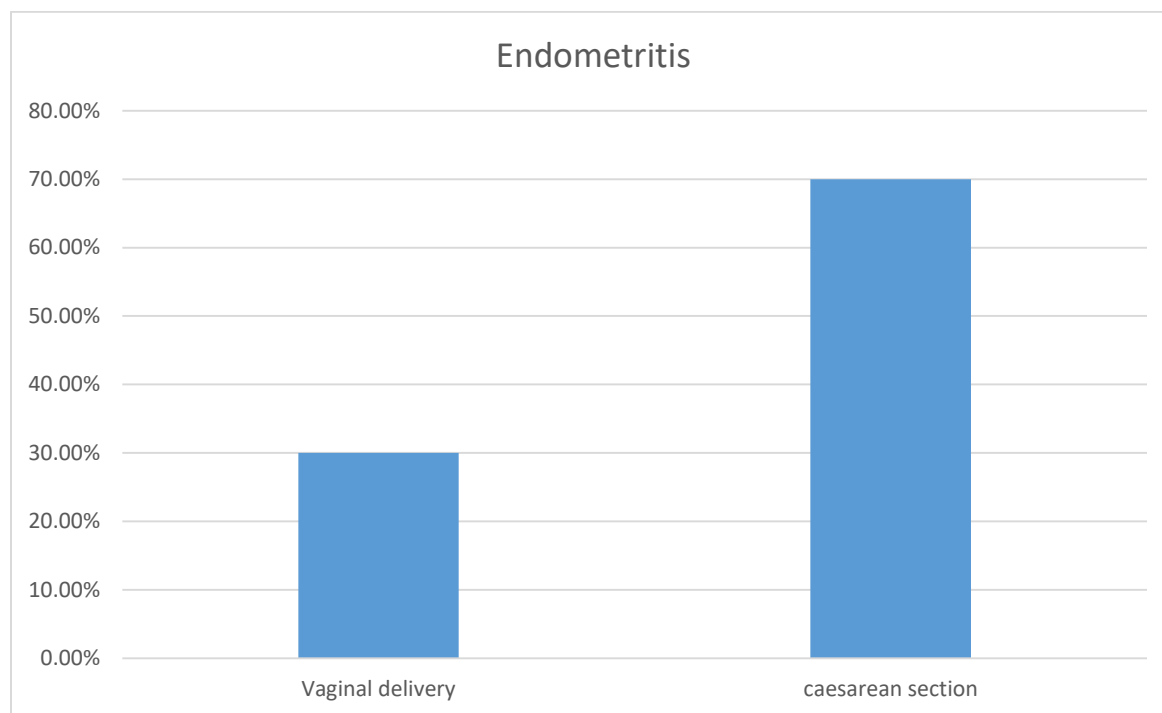


Figure 13: correlation between postpartum endometritis and method of delivery

The incidence of postpartum haemorrhage (blood loss greater than 500cc) is significantly lower in cases of vaginal delivery, 25% with respect to 75% in cases of caesarean delivery.

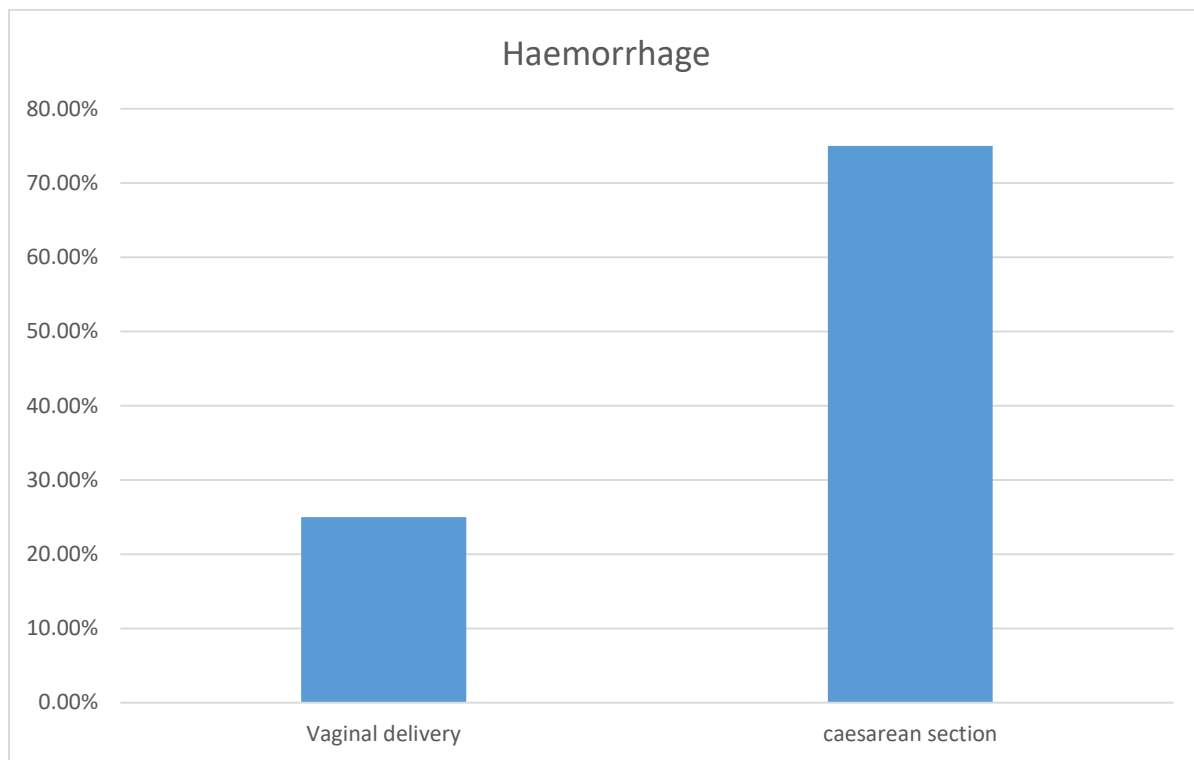


Figure 14: correlation between method of delivery and blood loss

It was noted that the occurrence of the postpartum preeclampsia depends on the number of antenatal consultations attended. 59.3% of cases were in women who attended less than five ANC while 40.7% had attended more than 5 ANC.

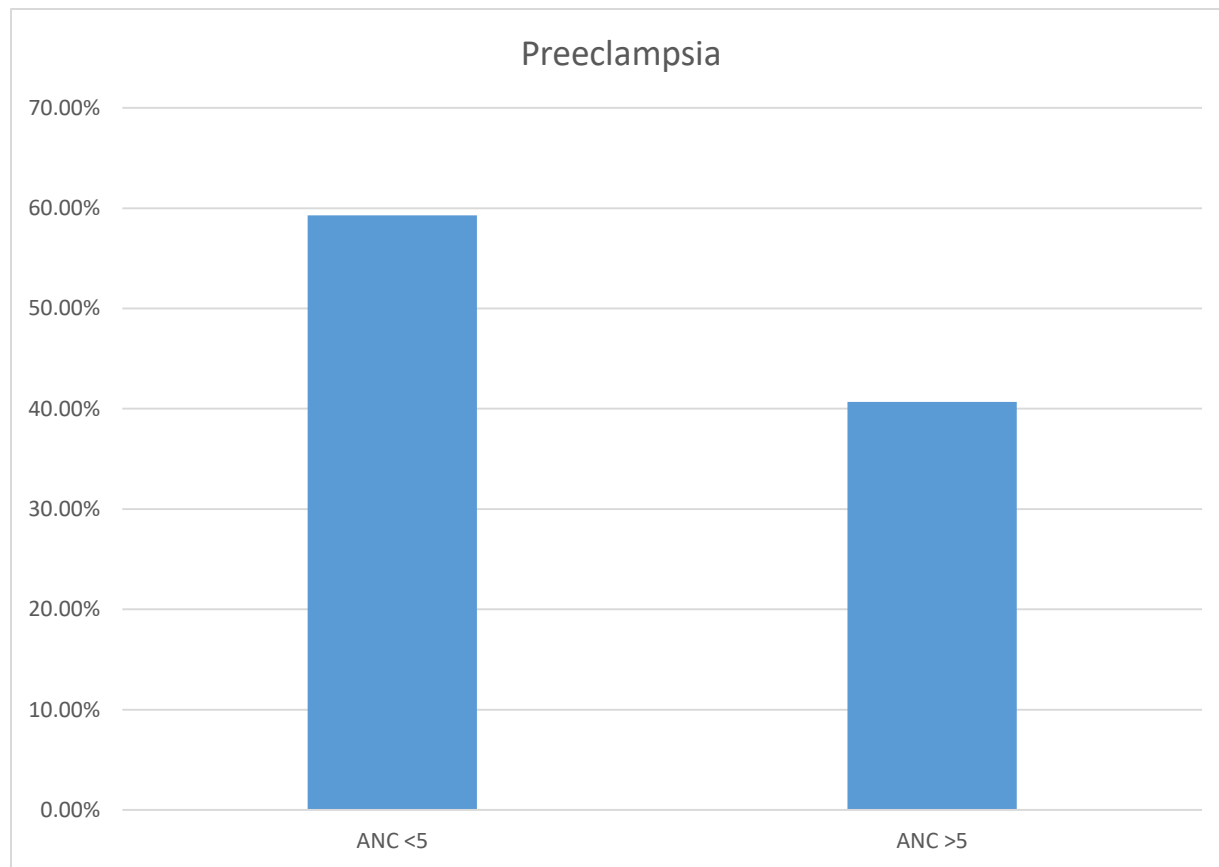


Figure 15: correlation between preeclampsia and number of ANC attended

LOGISTIC REGRESSION

Multiple logistic regression analysis showed that the consumption of *Triumfetta species* was inversely associated with the occurrence of postpartum haemorrhage ($p=0.086$, $OR=0.81$, 95% $CI=0.29-2.29$), preeclampsia ($p=0.286$, $OR=0.62$, 95% $CI=0.22-1.49$), endometritis ($p=0.486$, $OR=0.89$, 95% $CI=0.39-1.20$), and mastitis ($p=0.774$, $OR=0.55$, 95% $CI=0.23-1.89$) implying that the more *Triumfetta species* was consumed, the lower the odds of occurrence of these complications. Meanwhile the consumption of *Triumfetta species* is seen to increase the odds of postpartum anaemia ($p=0.849$, $OR=1.06$, 95% $CI=0.58-1.94$). However, none of these associations was statistically significant.

Table VIII: multiple logistic regression model for postpartum complications in women who consumed *Triumfetta species*

Model Covariates	p-value	aOR	95% CI
Anaemia	0.849	1.06	0.58 – 1.94
Haemorrhage	0.086	0.81	0.29 – 2.29
Preeclampsia	0.286	0.62	0.22 – 1.49
Endometritis	0.486	0.89	0.39 – 1.20
Mastitis	0.774	0.55	0.23 – 1.89

CHAPTER V : DISCUSSION

Studies show that 31.02% of the Cameroonian population use traditional medicine during pregnancy to improve its health state. We therefore sought to study the effects of *Triumfetta species* consumption on postpartum evolution, to determine the sociodemographic and obstetric profile of our participants, and to specify the postpartum outcomes in the exposed and non-exposed group. To achieve this, we carried out a prospective cohort study at the Yaoundé Gynaeco-Obstetric and Pediatric Hospital.

V.1. Limitations of the study

- This study was carried out only in one hospital in Yaoundé, so there is a need to carry out similar research in other hospitals and other regions.
- The inability to adequately quantify the exposure of participants to *Triumfetta species* could also create a bias in the results.
- Although inquired, we cannot be sure if study participants did not consume other forms of traditional medicine not mentioned, thereby creating bias.

Among the consumers, 53.9% women consumed *Triumfetta species* during pregnancy, 13% during labour and 33.1% in the postpartum. A study done by Kamel et al in 2022 in Morocco showed that 67.45% of their participants used medicinal plants during pregnancy, 26.82% during childbirth and 5.73% in the postpartum period. [60]

V.2. Sociodemographic profile of the study population

In this study, the mean age of the participants was 29.39 ± 6.05 years, with 28.13 ± 6.05 in the exposed and 30.65 ± 5.81 years in the non-exposed group. In a study done by Foumane et al in 2021 on plants used for delivery, they had a mean age of 29 ± 6.42 years. [56] This similarity could be explained by the fact that this is the age when most women reproduce.

Women were predominantly single with 53% and 54.8% in the exposed and the non-exposed groups respectively, with the proportion of singles being slightly higher in the non-

exposed group. This is different from studies done in Nigeria by Duru et al, in 2016 and another done in Zimbabwe by Mudonhi and Nunu in 2021, which showed that a majority of their participants were married. [61,62] This difference can be explained by the fact that Cameroon has different cultural views regarding matrimony.

Very few women in the non-exposed group (0.9%) had no formal education. The most represented educational level among our participants was secondary level at 53% and 59.1% in the exposed and non-exposed groups respectively. Studies done by Ameade et al, in 2018 show similar results with the most represented educational level being secondary education. [63]

Majority of our participants were housewives, accounting for 37.4% and 56.5% in the exposed and non-exposed groups respectively. This is lower than the results seen in a study by Ridzuan et al in west Malaysia, 2021. [64] This difference can be explained by the fact that Ridzuan's study was carried out in a rural area while ours is done in an urban area. Studies by James et al in 2018, show a higher percentage (79.9%) of unemployed done women. [65]

V.3. Obstetric characteristic of participants

Most women had a gravidity of 3-5 in both groups with 53.9% in the exposed group and 51.3% in the non-exposed group. Similarly, women in both groups were predominantly multiparous, 76.5% in the exposed and 71.3% in the non-exposed group. Studies done by Bekele and Negesse, in 2020 in Ethiopia and by Makombe et al in 2023 in Malawi, showed a similarity with a higher prevalence of multigravida and multiparous women. [66,67]

Our study revealed that 76.1% (81.7% of women in the exposed group and 70.4% in the non-exposed group) attended more than 5 antenatal consultations. This is different from studies done in northern Ghana by Ameade et al in 2018 which shows that majority of their participants, 51.4% had attended only 3-5 antenatal consultations. [63]

The most represented form of delivery among our participants was vaginal delivery at 62.6% in the exposed group and 51.3% in the non-exposed group. This is lower than results gotten

by Belinga et al in Bertoua in 2020 which showed that 89.8% of their study participants delivered through spontaneous vaginal delivery. [68]

It was also noted that the blood loss in these deliveries of more than 500cc in the exposed group at 4.3% and in the non-exposed group it was 9.6%. This is similar to a study done by Dohbit et al in 2019, where they had 4.8% in the exposed group with blood loss greater than 500cc. [5] This similarity can be explained by the fact that *Triumfetta species* (in both studies) is known to have uterotonic properties, thereby reducing the risk of great blood loss.

v.4. Postpartum evolution

In this study, 84 (36.5%) of women developed at least one obstetric adverse outcome. This was comparable to findings by Yimer et al in Southern Ethiopia, who found 39% of their study population also had at least one adverse obstetric outcome. [69] This similarity can be explained by the fact that both studies have similar study design and sample size.

The proportion of women who had complications was lower in women who consumed *Triumfetta species* (39.3%) as compared to those who did not consume *Triumfetta species* (60.7%). A study done by Mudonhi and Nunu in 2021 on Traditional medicine utilisation and maternal complications showed similar results. [62] Their results showed that 25.5% of their complications were in women who used traditional medicine during their pregnancy, while 74.5% of the complications were in women who did not use traditional medicine.

We had a higher proportion of women with postpartum anaemia in women who did not consume *Triumfetta sp.*, 16.5% compared to women with anaemia who consumed *Triumfetta sp.* at 12.2%.

A significant difference is noted in the case of postpartum haemorrhage with 4.3% in the exposed group and 9.6% in the non-exposed group. This is similar to results gotten by Kekana and Sebitloane in a study done in Durban, South Africa in 2020. [70] This can be explained by the fact that *Triumfetta species* is said to have uterotonic properties. Our results differ from those obtained

by Belinga et al in 2020, which showed that only 2.7% of participants had postpartum haemorrhage. [68]

We equally found 7.8% of the exposed group had postpartum preeclampsia/eclampsia and 15.7% in the non-exposed group. This is different from studies done by Tadase et al in 2022 in Northeast Ethiopia, with 24.1% occurrence of postpartum preeclampsia/eclampsia. [71] The higher percentage in their study can be explained by their larger sample size.

This was a similar case for postpartum mastitis, these values all being statistically significant with p values < 0.05. However, it was found that consumption of *Triumfetta species* had no noticeable impact of the occurrence of postpartum endometritis. This is different from studies done by Balkus et al in 2021, which registered a less than 1% occurrence of postpartum infections (endometritis, mastitis). [72]

It is observed that the method of delivery had impact on postpartum haemoglobin level. 36.4% of women who had anaemia gave birth vaginally while the other 63.6% gave birth through caesarean section. These results are similar to those gotten by Mremi et al, in a study in Tanzania in 2022. [73] Which showed that the risk of postpartum anaemia decreased in women who delivered vaginally as compared to those who delivered by caesarean section. This can be attributed to high risk of postpartum haemorrhage associated with caesarean section deliveries resulting in higher prevalence of postpartum anaemia compared to spontaneous vaginal delivery.

The occurrence of postpartum endometritis is greatly depended on the method of delivery. 30% of the cases were attributed to vaginal delivery and 70% to caesarean delivery. This results are similar to those in a study done by Taylor et al in 2023 which showed an increase risk of endometritis in cases of caesarean delivery compared to vaginal delivery. [74]

The incidence of blood loss greater than 500cc is significantly lower in cases of vaginal delivery, 25% with respect to 75% in cases of caesarean delivery. A study done by Amanuel et al in 2021 shows that women who gave birth through caesarean section were 5.8times more at risk of having postpartum haemorrhage than women who had spontaneous vaginal delivery. [75] This can be explained by the fact that caesarean section deliveries cause more damage to the vascular system.

Multiple logistic regression analysis showed that the consumption of *Triumfetta species* was inversely associated with the occurrence of postpartum haemorrhage ($p=0.086$, $OR=0.81$, 95% $CI=0.29-2.29$), preeclampsia ($p=0.286$, $OR=0.62$, 95% $CI=0.22-1.49$), endometritis ($p=0.486$, $OR=0.89$, 95% $CI=0.39-1.20$), and mastitis ($p=0.774$, $OR=0.55$, 95% $CI=0.23-1.89$) implying that the more *Triumfetta species* was consumed, the lower the odds of occurrence of these complications.

The effect of *Triumfetta species* consumption on preeclampsia can be explained by the fact that, this plant contains phenolic compounds (especially flavonoids), with antioxidant properties, are responsible for protecting the body from the damage caused by oxidative stress. [76]

Meanwhile the consumption of *Triumfetta species* is seen to increase the odds of postpartum anaemia ($p=0.849$, $OR=1.06$, 95% $CI=0.58-1.94$). *Triumfetta species* is known to contain many compounds including saponins. [58] The introduction of saponin in the body at certain concentrations causes haemolysis either by lipid solubilisation or by formation of pores and membrane defect. [77] According to a study by Jonge et al in 2018, it was seen that there is a decrease in red blood cell, haemoglobin and haematocrit count in samples with a high degree of haemolysis compared to those with no haemolysis. [78]

Though none of these associations was statistically significant in our study.

CONCLUSION

Our study had as objectives to determine the effects of *Triumfetta species* consumption on postpartum evolution of our study population. At the end of the study, we arrived at the following conclusions;

- The mean age of our study participants was 29 years, most of them were single housewives and educated. Majority of these women were multigravida and multiparous, had a good antenatal surveillance and gave birth vaginally.
- The occurrence of anaemia, haemorrhage, preeclampsia and eclampsia, mastitis in the postpartum in women who consumed *Triumfetta species* was lower than that of women who did not consume.
- The consumption of *Triumfetta species* therefore reduces the risk of occurrence of postpartum complications.

RECOMMENDATIONS

➤ **To the Scientific community**

To carry out further studies with a larger sample size and extensive follow-up in different parts of the country.

To study extensively on *Triumfetta species* and also identify its peak period of action during pregnancy.

To identify and extract the active principles of *Triumfetta species*, and make available galenic forms for clinical purposes.

➤ **To clinicians**

To consider the uptake of traditional medicine during antenatal surveillance and labour, to improve postpartum outcome.

➤ **To women of reproductive age**

To consider the consumption of *Triumfetta species* regularly in view of maternity.

➤ **To pregnant women**

To avoid consumption of *Triumfetta species* during the first trimester and instead consume during the last month of pregnancy and the postpartum period.

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APPENDIX

APPENDIX 1: ETHICAL CLEARANCE

UNIVERSITÉ DE YAOUNDÉ I
FACULTÉ DE MÉDECINE ET DES
SCIENCES BIOMÉDICALES
COMITÉ INSTITUTIONNEL D'ÉTHIQUE DE LA RECHERCHE
Tel/ fax : 22 31-05-86 22 311224
Email: decanatfmsb@hotmail.com

THE UNIVERSITY OF YAOUNDE I
FACULTY OF MEDICINE AND BIOMEDICAL
SCIENCES
INSTITUTIONAL ETHICAL REVIEW BOARD

Ref. : N° 1102 /UY1/FMSB/VDRC/DASR/CSU

CLAIRANCE ÉTHIQUE 19 JUL 2024

Le COMITÉ INSTITUTIONNEL D'ÉTHIQUE DE LA RECHERCHE (CIER) de la FMSB a examiné
La demande de la clairance éthique soumise par :
M.Mme : FORLEMU VERRA TSOPNTSOH Matricule: 17M081

Travaillant sous la direction de :
♦ Pr DOHBIT Julius SAMA
♦ Dr NDOUMBA NKENGUE Annick Mintya
♦ Dr MANIEPI NGOUOPIHO Jacqueline Saurelle Epse FOUMANE

Concernant le projet de recherche intitulé : **Effects of *Triumfetta species* consumption on postpartum evolution in the Yaoundé Gynaeco-Obstetric and Pediatric Hospital**

Les principales observations sont les suivantes

Evaluation scientifique	
Evaluation de la convenance institutionnelle/valeur sociale	
Equilibre des risques et des bénéfices	
Respect du consentement libre et éclairé	
Respect de la vie privée et des renseignements personnels (confidentialité) :	
Respect de la justice dans le choix des sujets	
Respect des personnes vulnérables :	
Réduction des inconvénients/optimalisation des avantages	
Gestion des compensations financières des sujets	
Gestion des conflits d'intérêt impliquant le chercheur	

Pour toutes ces raisons, le CIER émet un avis **favorable** sous réserve des modifications recommandées dans la grille d'évaluation scientifique.

L'équipe de recherche est responsable du respect du protocole approuvé et ne devra pas y apporter d'amendement sans avis favorable du CIER. Elle devra collaborer avec le CIER lorsque nécessaire, pour le suivi de la mise en œuvre dudit protocole. La clairance éthique peut être retirée en cas de non - respect de la réglementation ou des recommandations sus évoquées.

En foi de quoi la présente clairance éthique est délivrée pour servir et valoir ce que de droit

LE PRESIDENT DU COMITE ETHIQUE


Mme *Alena Endoa*
née *Phama Marie Thérèse*

APPENDIX 2: ADMINISTRATIVE AUTHORIZATION FROM THE YGOPH

REPUBLIC DU CAMEROUN
Paix-Travail-Patrie
MINISTÈRE DE LA SANTÉ PUBLIQUE
HOPITAL GYNECO-OBSTÉTRIQUE
ET PÉDIATRIQUE DE YAOUNDE
HUMILITÉ – INTEGRITÉ – VÉRITÉ – SERVICE



REPUBLIC OF CAMEROON
Peace-Work-Fatherland
MINISTRY OF PUBLIC HEALTH
YAOUNDE GYNAECO-OBSTETRIC
AND PEDIATRIC HOSPITAL
HUMILITY – INTEGRITY – TRUTH – SERVICE

COMITE INSTITUTIONNEL D'ETHIQUE DE LA RECHERCHE
POUR LA SANTE HUMAINE (CIERSH)

Arrêté n° 0977 du MINSANTE du 18 avril 2012 portant création et organisation des
Comités d'Ethiques de la Recherche pour la santé Humaines. (CERSH).

AUTORISATION N° 654/CIERSH/DM/2024

CLAIRANCE ETHIQUE

Le Comité Institutionnel d'Ethique de la Recherche pour la Santé Humaine (CIERSH) a examiné le 21 février 2024, la demande d'autorisation et le Protocole de recherche intitulé « effects of triumfetta species consumption on post partum evolution in three hospitals in Yaoundé » soumis par FORLEMU VERRA TSOPNTSOH.

Le sujet est digne d'intérêt. Les objectifs sont bien définis. La procédure de recherche proposée ne comporte aucune méthode invasive préjudiciable aux participants. Le formulaire de consentement éclairé est présent et la confidentialité des données est préservée. Pour les raisons qui précèdent, le CIERSH de HGOPY donne son accord pour la mise en œuvre de la présente recherche.

FORLEMU VERRA TSOPNTSOH devra se conformer au règlement en vigueur à HGOPY et déposer obligatoirement une copie de ses travaux à la Direction Médicale de ladite formation sanitaire.

Yaoundé, le **28 FEB 2024**

LE PRESIDENT

 **Prof MBU Robinson**
Directeur Général
HGOPY

N°1827 ; Rue 1564 ; Ngoussou ; Yaoundé 5^{ème}
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APPENDIX 3: INFORMED CONSENT FORM

I, Mrs./Ms.....the undersigned, hereby freely and voluntarily agree to participate in the medical study entitled: **Effects of *Triumfetta species* (Nkui) consumption on postpartum evolution in the Yaoundé Gynaeco-Obstetric and Pediatric Hospital**, carried out by FORLEMU Verra, a final year medical student.

On the understanding that:

- The investigator informed me and answered all my questions
- The investigator has made it clear to me that my participation is free, unpaid and that I may withdraw from this research at any time without prejudice to my relationship with the doctor and my care.
- I acknowledge having read and understood this form
- I accept that the data recorded during this study may be subject of a publicly defended thesis

Yaoundé, on the

Signature of participant.....

APPENDIX 4: DATA COLLECTION FORM

Effects of *Triumfetta species* (Nkui) consumption on postpartum evolution

Form number:

Group: ____ Consumers=1 non-consumers=2

Date:/...../2024

1. IDENTIFICATION

Age:
Matrimonial Status: <input type="checkbox"/> Single=1 Married=2 Divorced=3 Widow=4
Level of Education: <input type="checkbox"/> None=1 Primary=2 Secondary=3 University=4
Region: <input type="checkbox"/> Far North=1 North=2 Adamawa=3 East=4 South=5 Littoral=6 Centre=7 West=8 North West=9 South West=10 Foreigner=11
Occupation: <input type="checkbox"/> Student=1 Housewife=2 Teacher=3 Employed=4 Unemployed=5

2. PAST HISTORY

Gravida: Parity:
Number of ANC:
Pathologies during pregnancy: <input type="checkbox"/> None=1 Malaria=2 Preeclampsia=3 Gestational diabetes=4 Others=5
Delivery method: <input type="checkbox"/> Vaginal=1 Induced=2 Cesarienne=3
Blood loss: <input type="checkbox"/> <500cc =1 >500cc =2
Medical history: <input type="checkbox"/> None=1 Hypertension=2 Diabetes=3

Nkui Consumption: <input type="checkbox"/> Yes=1 No=2
Period: <input type="checkbox"/> During pregnancy=1 During labour=2 Postpartum=3
Route: <input type="checkbox"/> Oral = 1 Rectal =2

3. PHYSICAL EXAMINATION

Blood pressure/.....mmHg
Pulsebpm
Temperature°C
Conjunctiva	<input type="checkbox"/> Colored=1 Pale=2
Breast	<input type="checkbox"/> Milk letdown=1 swelling=2
Abdomen	Fundal height :.....cm
External genitalia: <input type="checkbox"/>	Clean=1 Non purulent lochia=2 malodorous purulent lochia=3

4. LABORATORY WORKUPS

Before delivery	In postpartum
Hb:	Hb: Urinary dipstick: Proteins: <input type="checkbox"/> None=0 +=1 ++=2 +++ =3

5. TREATMENT

Iron supplements	<input type="checkbox"/>	Yes=1	No=2
Analgesics	<input type="checkbox"/>	Yes=1	No=2
Antibiotics	<input type="checkbox"/>	Yes=1	No=2
Antithrombotic	<input type="checkbox"/>	Yes=1	No=2
Blood transfusion	<input type="checkbox"/>	Yes=1	No=2
Others	<input type="checkbox"/>	Yes=1	No=2

6. HOSPITAL STAY

Vaginal delivery:
Caesarean:
Evolution : <input type="checkbox"/> Discharged=1 Death=2