"A STUDY TO EVALUATE THE EFFECTIVENESS OF PERINEAL CARE BUNDLE INTERVENTION AND DETERMINANTS OF IMMEDIATE ADVERSE PREGNANCY OUTCOMES IN MOTHERS ADMITTED AT SELECTED TERTIARY CARE HOSPITAL AT BELAGAVI, KARNATAKA"

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For the award of the degree of
Doctor of Philosophy
In the Faculty of Nursing

By

Mrs. Jaya Koirala
Registration No: KLEU/Ph.D.-20-21/DO1220028

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2023

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Even the most analytical thinkers are predictably irrational; the really smart ones acknowledge and address their irrationalities.

- Dan Ariely

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Date:

Place: Belagavi **Mrs. Jaya Koirala**

ABBREVATIONS

AD	:	Anno Domini
AMANAT	:	Asset Management and Accounting Network for Administrators and Treasurers
ANC	:	Antenatal Care
APGAR	:	Appearance, Pulse, Grimace, Activity, and Respiration
BA	:	Birth Asphyxia
BMMS	:	Bangladesh Maternal Mortality Surveys
CI	:	Confidence Interval
DLHS	:	District Level Household and Facility Surveys
ESBL	:	Extended-Spectrum Beta-Lactamase
Hb	:	Hemoglobin
HDSS	:	Health and Demographic Surveillance System
HSS	:	Health Systems Strengthening
IV	:	Intravenous
LBW	:	Low Birth Weight
MA	:	Medical Aid
MGIMS	:	Mahatma Gandhi Institute of Medical Sciences
MOH	:	Major Obstetric Hemorrhage
MRSA	:	Methicillin-Resistant Staphylococcus Aureus
NASG	:	Non-pneumatic Anti-Shock Garment
NBW	:	New Born Weight
NFHS	:	National Family Health Survey
NHI	:	National Health Insurance
NICU	:	Neonatal Intensive Care Unit

NPS	:	Numerical Pain Scale
NRHM	:	National Rural Health Mission
OASI	:	Obstetric Anal Sphincter Injuries
P	:	Proportion
PNC	:	Postnatal Care
PPH	:	Post-Partum Haemorrhage
PROM	:	Premature Rupture of Membrane
RCT	:	Randomized Controlled Trial
REEDA	:	Redness, Ecchymosis, Edema, Discharge, Appropriation
SDG	:	Strategic Development Goal
SPC	:	Self-Perineal Care
SPSS	:	Statistical Package for Social Sciences
TT	:	Tetanus Toxoid
TXA	:	Tranexamic Acid
UNICEF	:	United Nations Children's Fund
UPUMS	:	Uttar Pradesh University of Medical Sciences
USA	:	United States of America
US	:	United State
VAS	:	Visual Analogue Scale
WHO	:	World Health Organization

ABSTRACT

Background: Vaginal childbirth is undergone by more than 85% of mothers, frequently leading to perineal trauma and notable episiotomy rates of 93.3% among primiparous mothers and 30.2% among multiparous mothers. Central to perineal care is vigilant infection monitoring due to common postpartum discomfort, often exacerbated by episiotomies, resulting in swelling, lesions, rashes, sores, and boils. Post-birth, meticulous perineal care is crucial for preventing infections and promoting swift healing of rectal and pelvic muscles. This study objectives to evaluate the efficacy of perineal care interventions as its primary objective, while also seeking to identify determinants of immediate adverse pregnancy outcomes among mothers as a secondary objective.

Methodology: This study adopts an evaluative approach through a randomized controlled trial, involving 167 participants distributed across intervention and non-intervention groups. The research was conducted within the labour and postnatal wards of a tertiary care hospital based in Karnataka. Research tools utilized included a structured interview schedule, checklist, Redness, Edema, Ecchymosis, Discharge and Approximation (REEDA) Scale, and Visual Analogue (VAS) Scale to evaluate the impact of perineal care interventions on postpartum outcomes.

Results: Among 167 participants in the intervention group, both pre- and post-culture reports showed no organism growth. Conversely, within the non-intervention group of the same size, 16 (9.6%) subjects displayed organism growth in post-test reports. Notably, all 167 participants in both groups exhibited normal findings in their initial pre-test reports, indicating an absence of issues before the study's interventions. Significant associations emerged in adverse pregnancy outcomes: Birth asphyxia was notably higher among pure vegetarians and older women (36≥) with a 15-fold increase and an 18.62 times association with mild anemia. Additionally, it is related to illiteracy, primary education, and a monthly income of 5000-9999. Similarly, low birth weight was prevalent among older mothers (36≥), those with PUC education, incomes below 5000, and consanguineous marriages. Preterm birth significantly increased (12.36 times) in the 26-30 age group, associated with rural residence, private service jobs, 5000-9999 incomes, and moderate anemia. Postpartum hemorrhage was more frequent in mothers above 30, engaged in agriculture, with lower education and incomes of 10000-19999. Blood transfusion rates were notably higher in PUC-educated mothers with incomes below 10000 per-month.

Conclusion: In light of the superior effectiveness demonstrated by the perineal care bundle intervention employing an antiseptic solution compared to self-perineal care instruction, this study sheds light on critical determinants influencing immediate adverse pregnancy outcomes. Spanning across maternal age, residence, occupation, education levels, monthly family income, frequency of antenatal care visits, hemoglobin levels, and dietary patterns, these findings emphasize the need for targeted interventions and comprehensive maternal care strategies. Acknowledging these determinants enables the development of tailored approaches aimed at mitigating adverse pregnancy outcomes, emphasizing the significance of proactive and holistic maternal healthcare.

Keywords: Adverse; Antiseptic; Bundle; Care; Determinants; Immediate; Intervention; Outcomes; Perineal; Pregnancy.

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INTRODUCTION

1.1. Background of the Study

Pregnancy and labor are crucial public health concerns affecting both developed and developing nations. Labor comprises a series of events occurring within the genital organs, culminating in the delivery of the fetus, placenta, and membranes from the womb to the outside world through the genital canal.[1] However, vaginal birth often leads to perineal trauma, causing damage to the skin of the rectum and anal sphincter. This trauma is associated with various major complications.[2] The gravity of these issues are emphasized by reports from the United Nations International Children's Emergency Fund (UNICEF), which reveal that preventable complications during pregnancy, childbirth, or the postpartum period claim the lives of approximately 810 women daily on a global scale.[3] Postpartum infection can occur after delivery and has been identified as the leading cause of maternal morbidity and mortality in developing countries.[4]

Over 140 million women deliver worldwide, with 16.3% of maternal deaths occurring pregnancy-related infections reported annually.[5,6] The prevalence of these infections is particularly pronounced in low-resource settings, where many maternal deaths associated with infections could be prevented.[7] Puerperal infection is characterized by poor intrapartum cleanliness, a low socioeconomic status, primiparity in the mother, anemia, premature rupture of the membranes, prolonged labor, and repeated vaginal exams during delivery.[8] Similarly, mothers with only elementary or informal education, older age, residence in lower-income households, poor perinatal hygiene, repeated prevaginal examination, and anemia are at a significant risk.[9-12]

Approximately 12% of maternal deaths in India result from puerperal infections. Several factors influence the occurrence of hemorrhage, pregnancy-related infection, and pregnancy-related hypertensive disorder depending on the location and type of postpartum care received.[13] Puerperal infections can, in nature, be prevented, yet they still significantly contribute to maternal morbidity and mortality.[10] Puerperal infection can result from perineal wounds, which create favorable conditions for bacterial growth. The perineum, being a moist area, provides an ideal environment for bacteria, making it susceptible to infections. Infections originating from perineal wounds have the potential to spread to the urinary system or birth canal. Additionally, infectious illnesses can exacerbate damage to the skin's supporting tissues, thereby impeding the healing process of perineal wounds.[14] The skin forms a crucial mechanical barrier that largely prevents infection, but this barrier can be compromised by skin injuries.[15] It is imperative that this barrier is repaired promptly for this reason. Certain procedures used to alleviate pain and discomfort during puerperal may affect wound healing. The lack of research on the effectiveness of different therapies and regulations related to perineal wound care is a cause for concern.[16] It is essential for all nurses to address this issue, especially since 18.5 % of new mothers experience severe perineal difficulties.[17-18]

The three primary objectives of perineal wound care are to reduce pain and suffering, prevent infections, and expedite the healing process. Prioritizing pain and discomfort reduction does not negatively impact wound healing.[19] The healing process involves four stages: hemostasis, inflammation, proliferation, and maturation.

When epithelialization has occurred and collagen remodeling has restored most of the skin's tensile strength, the healing process is considered complete.[20] A study's findings on utilizing an Ayurvedic regimen for episiotomy wound management support the notion that the reconstruction of perineal wounds achieves the fundamental objective of aligning opposing wound edges. This approach minimizes tissue loss, promotes rapid healing, and subsequently contributes to enhancing the quality of life for the patient. The healing process takes around 10 days from the time of birth to complete.[21]

Sufficient intake of proteins, calories, and vitamins (especially vitamin C), along with efficient waste product elimination, is essential for optimal recovery.[22] The environment surrounding the wound should be warm, moist, and free from impurities and infections. Patients are routinely advised to clean their wounds with betadine to prevent infection.[23] Inadequate diet, improper wound care, smoking, and other factors can also hinder the wound-healing process. It has been demonstrated that smoking reduces the oxygen concentration and saturation in blood and subcutaneous tissue around wounds, leading to delayed healing.[24-25]

After a perineal episiotomy, mothers may experience various consequences, including bleeding, infection, damage to the mucosa and anal sphincter, wound opening, dyspareunia, decreased libido, perineal pain, and anal and urinary incontinence.[26] Reports indicate that episiotomy-related perineal pain and discomfort can disrupt women's daily activities, such as sitting, walking, and lifting their newborns, and may hinder proper nursing, rooming-in, and the development of mother-infant bond.[27-28]

Recent research conducted across 18 tertiary care facilities in India has reported episiotomy rates of approximately 85% for nulliparous women and 39% for multiparous women.[29] Episiotomy wound care, including local wound care and pain management techniques, should commence as soon as possible after birth. Given the distress episiotomies can cause, it's crucial to closely monitor for any signs of infection in the first few days following delivery.[30]

Betadine (povidone-iodine) is an affordable antiseptic solution comprising polyvinyl pyrrolidone, normal saline, iodine, and 1% available iodine. It demonstrates bactericidal properties against a broad spectrum of infections, affecting various microorganisms, including gram-positive and gram-negative bacteria, spores, cysts, mycobacteria, fungi, viruses, and protozoa. Studies have shown that Staphylococcus aureus and Mycobacterium chelonae are eliminated more rapidly when a 10% povidone-iodine solution is diluted up to a 1:100 ratio compared to the undiluted solution. This heightened antibacterial activity at lower concentrations is believed to stem from increased levels of free iodine and the weakening of bonds between iodine and povidone molecules.[31-34]

The preferred wound cleansing solution is normal saline (0.9%) because it is an isotonic solution that does not harm tissue, disrupt the natural healing process, trigger sensitization or allergies, or alter the skin's normal bacterial flora, which could potentially promote the growth of more pathogenic organisms. Since healing occurs without the need for local antibiotics or disinfectants, using plain saline is the least harmful option and is also more cost-effective, easy to produce, and widely available.[35]

The primary objectives of episiotomy wound care are to ensure optimal blood flow, oxygenation, delivery of nutrients, and prevention of infection.[16] Indicators such as redness, edema, ecchymosis, discharge, and the alignment of skin borders are used to assess the healing process. These factors contribute to the assessment of tissue trauma by adding to the overall Redness, Edema, Ecchymosis, Discharge, and Approximation (REEDA) score.[36, 28,37,38]

A recent study identified several immediate poor pregnancy outcomes, including low birth weight, premature delivery, hypoxia at birth, anemia, post-delivery hemorrhaging, and blood transfusions. Pregnancy outcomes are influenced by various factors, including the mother's age, socioeconomic status, education level, occupation, monthly family income, prenatal care visits, iron and folic acid supplementation, calcium and vitamin tablet intake, Tetanus Toxoid (TT) vaccination, dietary habits, Antenatal Care (ANC) follow up visit, rural residence, obstetric history, gravidity, and utilization of healthcare services, smoking, tobacco consumption. [39-41]

Unfavorable neonatal outcomes significantly impact perinatal and neonatal survival, as well as the likelihood of developmental impairments in later life.[42] The primary public health concern in underdeveloped nations is adverse newborn outcomes.[43] Low Birth Weight (LBW), premature delivery, low Appearance, Pulse, Grimace, Activity, and Respiration (APGAR) scores at one and five minutes after birth, and birth asphyxia are all considered unfavorable neonatal outcomes.[44,41] A live baby delivered with a birth weight of less than 2,500 grams is referred to as LBW.[45] Over 20 million births occur each year worldwide, with 15% to 20% of all newborns having low birth weight. There is a higher chance of immediate and long-term consequences for low birth weight babies.[46] Preterm delivery, denoting the birth of an infant before completing 37 weeks of gestation, stands as a critical concern. Each year, the global count exceeds 15 million premature births, contributing tragically to around one million preterm fatalities predominantly in low- and middle-income nations. Preterm birth is the greatest cause of death in children, accounting for 1 million deaths before the age of five and 18% of all deaths in children under the age of five. Preterm birth rates and mortality rates both vary significantly between and within nations. Preterm birth rates, however, are notably higher in low- and middle-income nations, particularly those in Southeast Asia.[47-48] A total APGAR score of less than 7, on a scale that ranges from 0 to 10, indicates a low APGAR score. The APGAR score assesses a newborn's general physical health and well-being immediately after birth by evaluating five main factors: appearance, respiration (breathing effort), activity (muscle tone), grimace response (reflexes or irritability), and pulse (heart rate).[49-50] The condition known as birth asphyxia is characterized by inadequate oxygenation of the fetus within the uterus or of the newborn during or immediately after labor and delivery.[51]

Approximately 25%-43% of all maternal deaths are attributed to postpartum hemorrhage (PPH), making it one of the leading causes of morbidity and mortality among mothers in developing countries.[52] Several studies suggest that early diagnosis and more timely and effective treatment have the potential to prevent a significant number of PPH-related deaths.[53] In developing nations, postpartum hemorrhage (PPH) poses a substantial threat to maternal lives, emphasizing a critical public health concern. This condition alone accounts for 30% to 50% of maternal deaths in these regions, highlighting its profound impact on the health and well-being of mothers. Blood loss more than 500 mL after vaginal delivery and 1000 mL after a caesarean section is generally referred to as PPH.[54-56] Serious consequences from PPH can result in severe morbidity, including organ failure, shock, edema, compartment syndrome, thrombosis, anemia, acute respiratory distress syndrome, sepsis, and lengthy hospital stays.[57-58]

Uterine atony, or impaired uterine contraction following delivery, is the most prevalent cause of PPH, accounting for roughly 69% of cases.[59] Atony may be caused by an infection, anomalies in the placenta, over-distention of the uterus, or distention of the bladder.[60] Clinical characteristics linked to uterine atony, such as multiple gestations, polyhydramnios, high parity, and prolonged labor, may raise suspicions even though the majority of mothers who develop PPH have no known risk factors. PPH can also result from uterine rupture or inversion, lacerations, retained placenta, or clots, and hereditary or acquired coagulation disorders.[57,61] A study previously reported that PPH occurs in 18% of deliveries, which may even lead to loss of life in developed countries.[61]

Mothers who have hypovolemia due to obstetric bleeding are in a serious condition and blood transfusion is one of the most important managerial tasks for preventing them from this serious condition. Particularly for patients in severe conditions, transfusion blood oxygenates organ tissues, maintains blood volume in circulation, and prevents disseminated intravascular coagulopathy.[62,57] Worldwide, the use of transfusions during childbirth has increased by 33%.[63] Nowadays, postpartum blood transfusions are given to up to 3% of all women. Although the majority of blood transfusions are safe and frequently save lives, there are serious worries about unfavorable reactions. Pregnancy modulates the immune system and transfusion is linked with increased levels of leukocyte antibodies. This rise is also linked to a lower transfusion threshold.[64]

One of the most common pregnancy problems is iron deficiency anemia, which adversely affects more than 56% of individuals in developing countries, compared to 17.4% in developed countries.[65] Approximately 36.8% of pregnant women globally suffer from anemia.[66]Anemia caused by dietary deficiency is one of the most prevalent disorders affecting expectant mothers; prevalence rate from 62.4% in Karnataka, India, 40 to 60% in underdeveloped nations, and 23 to 16.4% in wealthy nations.[67-69] Untreated antenatal iron shortage or anemia, as well as significant blood loss during or after childbirth, are the main causes of postpartum anemia. Anemia resulting from iron deficiency in a large number of mothers is a cause of postpartum anemia.[70-71] It is critical to take into account other aspects such as nutritional inadequacies and social, demographic, and economic factors that may contribute to the condition.[72]

Iron deficiency anemia, either before or during pregnancy, and excessive blood loss are the major causes of postpartum anemia in developing countries. Postpartum anemia frequently manifests as fatigue, depression and pale complexion. Postpartum anemia may be managed primarily with iron supplements. However, if not treated in time the health of the mother and the child are impacted by postpartum anemia. Maternal iron shortage or consequences from anemia can limit physical ability and performance and have a detrimental effect on health-related quality of life.[71,65,73,74]

A review of the literature revealed that a number of variables, including maternal age, education level, socioeconomic status, parity, obstetric history, low ANC visit, maternal anemia, counseling, supplementary diet, short pregnancy outcomes, infection, tobacco use, maternal occupation, alcohol consumption, smoking, and prenatal care, are independently associated with term live births in the Indian population. Prenatal screening ought to start in order to identify high-risk pregnant women and provide them with a plan for pregnancy along with ongoing guidance. Understanding the broad underlying term LBW and the many components of maternal risk factors throughout pregnancy may be helpful to healthcare providers. [75-77]

Studies suggest that the use of an antiseptic solution for perineal care may decrease the incidence of infection among mothers and newborns. These procedures can be easily administered and are cost-effective which may prevent infection in mothers and newborns in low-resource settings.[78-79] Hence, this study's primary objective was to assess the effectiveness of a perineal care bundle (with antiseptic solution and use of sterile pads intervention) to prevent infection. In India maternal mortality ratio is still very high (113 per 1,00,000 live births). Maternal and neonatal health is still a serious health concern. A recent study conducted in South India in 2022 reported 7.9% PPH, 26.7% LBW, 28.7% preterm delivery, 53.5% anemia, and 9.9% blood transfusions as immediate adverse pregnancy outcomes.[39] Identification of immediate adverse outcomes among mothers may help overcome the research gap which may help improve health care for mothers and newborns from the policy formulation level yet there are only a few research conducted on the topic. So, the researcher is interested in the topic, “A study to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka.”

1.2 NEED FOR THE STUDY

The moment of childbirth stands as an awe-inspiring milestone in a mother's journey. It possesses a profound capacity to sculpt her future, intertwining a tapestry of enduring joys and challenges that intricately shape her life.[80] Perineal tears often occur in vaginal delivery, either spontaneously or through interventions such as an episiotomy.[81,82] In the context of vaginal deliveries, perineal traumas are a prevalent occurrence, affecting approximately 85% of mothers worldwide.[81,83] These traumas can lead to complications like bleeding, infections, and postpartum discomfort. Their potential to give rise to subsequent challenges, including depression, dyspareunia, and a negative impact on both quality of life and sexual well-being, is noteworthy.[26,84] The burden of puerperal infection is particularly pronounced in low and middle-income countries, disproportionately affecting vulnerable populations that necessitate meticulous hygiene and care.[85,86] Literature suggests that residence of mothers was significantly associated with puerperal infection. Women who were living in rural areas were 2.5 times more likely to develop puerperal infection when compared to those mothers living in urban areas. Additionally, age, occupation, lower level of education, low socio-economic status, lower number of ANC visits, and multiple vaginal examinations are associated factors of puerperal infection.[10]

Furthermore, differences in skin elasticity often result in a higher likelihood of Asian women requiring episiotomies compared to non-Asian women, due to the tendency of Asian skin to stretch less efficiently.[87-88] Lacerations in the perineum, cervix, vagina, and vulva can manifest spontaneously or as a result of medical interventions like episiotomies. Serious lacerations are correlated with an elevated prevalence of long-term pelvic floor dysfunction, pain, dyspareunia, and emotional distress. Lacerations lead to enduring issues, with the prevention of perineal trauma being a pivotal aspect of nursing care.[89-90]

Perineal pain and discomfort, episiotomy infections, and puerperal sepsis are all sources of morbidity and mortality in women in the postnatal stage. Perineal pain and discomfort are one of the leading contributors to maternal morbidity.[16] Prevalence of puerperal infection varies in different geographical regions: 33.5% in Nigeria,[91] 68.65% in India,[92] and 72.9% in Sudan. [93]

Studies have demonstrated that women in Asian countries, due to their short perineum and strong tissue, are prone to large ruptures of the perineum during vaginal delivery so episiotomy is still common.[87] Episiotomy, like any other wound, can lead to infection and delayed healing. Infection occurrence can be due to the mother's body microbial flora (the vagina, gastrointestinal tract, and skin) or external microorganisms (infected medical staff conducting the delivery, poor surgical techniques, and infected instruments and delivery environment), especially in low-resource settings. It clinically manifests with fever, local pain, hyperthermia, redness, ecchymosis, and discharge from the incision site, and is sometimes associated with perineal abscesses, delayed wound healing, or wound opening.[94]

A notable study conducted in India aimed to assess the effectiveness of betadine compared to normal saline dressing in promoting the healing of episiotomy wounds. This study involved a random sample of 100 postnatal mothers, with half using normal saline dressing and the other half using betadine. The initial standardized REEDA scores revealed that 20% were categorized as mild, 88% as moderate, and 92% as severe in the pre-test. Subsequently, the post-test results showed improvement, with 76% exhibiting normal healing, 80% showing mild improvement, and 26% showing moderate improvement. The study highlighted the positive impact of betadine on episiotomy wound healing, as evidenced by lower mean scores on the REEDA scale.[95]

According to a recent study in Ethiopia, determinants of adverse birth outcomes are; low antenatal care visits, anemia, premature rupture of membrane, pregnancy-induced hypertension, inadequate dietary supplementation, low socioeconomic status, residence in a remote area, and physical abuse. The health care provider should play a pivotal role in improving regular ANC follow-up visits, counseling about the supplementing recommended proper diets, and awareness about the pregnancy-related consequences that can minimize the adverse birth outcomes.[96]

In a 2016 Maharashtra study, 629 women were involved, and 38.32% faced complicated pregnancy outcomes. Univariate analysis highlighted a strong link between pregnancy outcomes and education, occupation, socio-economic status, age at marriage, and consanguineous marriage. Maternal age and residence showed noteworthy correlations, while no significant ties were found between pregnancy outcomes and family type or access to transport facilities.[97]

The incidence of PPH has been 2 to 4% % in vaginal deliveries and 6% in cesarean deliveries. Maternal mortality due to PPH is 19.9% In India.[98] Prevalence of postpartum anaemia was found at 70% anemic (Hb < 11 g/dL) in north rural India.[99] Postpartum anaemia was a common but often neglected public health issue throughout the world. The prevalence of postpartum anemia was 32.7% in overall.[100] Around 70 thousand maternal deaths occurring each year globally were attributed to peripartum hemorrhage and anemia in low and middle-income countries.[101] The prevalence of postpartum anemia also varies according to the income of different countries. Early postpartum anaemia 50% in high-income and 50 to 80% in low-income countries.[102] Anemia in the postpartum period is, therefore, a significant issue in Bangladesh at 41.8%, Maldives at 58.5%, Nepal at 40.6%, and in Southern India at 47.3%.[72] Postpartum anemia impairs the quality of life, reduces cognitive abilities, emotional stability, and increases the risk of depression, and constitutes a significant health problem in women of reproductive age.[103]

A study conducted in Gujarat, India, encompassing 2,200 patients, identified 440 individuals requiring blood transfusions. Among these cases, 70% were attributed to obstetric hemorrhage, while 30% resulted from severe anemia (less than7 gm/dl).[104]

The facts above have instigated a profound realization within the researcher. This realization underscores the imperative to integrate the utilization of normal saline with 5% betadine and sterile sanitary pads into the realm of nursing practice. Despite its proven efficacy in facilitating the healing process and prevention of episiotomy wound infection, the adoption of normal saline with 5% betadine along with sterile sanitary pads remains surprisingly limited in comparison to alternative treatments.

This observation prompted an assessment of the actual efficacy of self-perineal care guidelines concerning infection prevention and episiotomy wound healing. The literature analysis also revealed that maternal and newborn health remains a pressing concern requiring immediate attention. However, there is limited published research showcasing the immediate adverse effects experienced by mothers across various regions in India. Identifying mothers who face adverse outcomes becomes crucial in enhancing maternal and newborn health at the policy-making level. Consequently, our secondary goal in this study is to determine the immediate adverse outcomes among mothers and newborns.

1.3 Title of the Study

A study to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka.

1.4 Objectives

Primary Objective

To assess the effectiveness of perineal care bundle (with antiseptic solution and use of sterile pads intervention) to prevent infection among mothers admitted in tertiary care hospital, Belagavi, Karnataka, India.

Secondary Objective

To identify the determinants of immediate adverse pregnancy outcomes among the mothers admitted in tertiary care hospital, Belagavi, Karnataka

1.5 Research Hypothesis

The hypotheses were tested at 0.05 levels.

An evaluative research approach was used in this study to evaluate the effectiveness of perineal care bundle intervention and immediate adverse pregnancy outcomes among mothers admitted to labour and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

1.6 Operational Definition of Variables

Effectiveness: It refers to the absence of microorganisms in the perineal area, which are the outcomes of the perineal care bundle intervention for the intervention group, as well as the instructions for self-perineal care practice of the participating mothers and their respective outcomes in both labouring and postnatal mothers.

Self-Perineal Care Bundle Instruction: It refers to mothers who are verbally instructed for self-perineal care before and after delivery on how to maintain proper hand hygiene and perineal hygiene to prevent infection for the non-intervention group.

Perineal Care Bundle: It refers a specific bundle comprising a 5% Betadine solution (5ml) diluted with 20ml of normal saline and sterile gauze pieces. These components are used to clean the perineal region, replacing the use of sterile sanitary pads. In the intervention group, this protocol is implemented every 2 hours during labour and every 4 hours post-delivery. Additionally, sterile pads are frequently changed after delivery and continued until discharge. The primary goal of this perineal care bundle protocol is to enhance perineal hygiene and reduce infections among mothers in labour and postnatal wards.

Standard Care: It refers to the basic nursing care provided to labouring and postnatal mothers throughout their hospitalization until discharge.

Determinants Factors: In this study determinants factors are; age, residence, education, religion, occupation, parity, monthly family income, antenatal care visit, type of marriage, dietary pattern, smoking habit, alcohol consumption, and hemoglobin level.

Immediate Adverse Pregnancy Outcomes: It refers to neonatal outcomes like low birth weight, preterm birth and birth asphyxia; and maternal immediate adverse outcomes like postpartum haemorrhage and blood transfusion**.**

High Vaginal Swab Culture: It refers to a medical procedure used to test vaginal discharge for the presence of bacterial (gram-positive and gram-negative) and fungal (Candida albicans and non-Candida albicans) growth in labouring and postnatal mothers admitted to labour and postnatal wards in selected tertiary care hospitals.

Normal saline: It refers to a sterile isotonic solution which contains 0.9 % sodium chloride in 100 ml (9g per litter) of sterile water.

Betadine Solution: It refers to betadine 5% solution in 100 ml used as an antiseptic and disinfectant used to treat and prevent perineal infection and promote episiotomy wound healing.

Mothers: It refers to mothers who are admitted in labour and postnatal ward in a selected tertiary care hospital.

Intervention Group: It refers to mothers receiving standard perineal care along with perineal care bundle intervention.

Non-intervention Group: It refers to mothers receiving standard perineal care along with instructions of perineal care bundle.

Episiotomy Wound: It refers to an episiotomy wound which is a deliberate surgical incision made in the perineum during childbirth to ease the baby's delivery and lower the risk of extensive tearing in the perineal tissue.

Pain: It refers to 'pain' which is defined as the patient's subjective physical discomfort following an episiotomy caused by tissue trauma. It is quantified using the Numeric Rating Scale (VAS) and is reflected in physiological indicators such as;

VAS scale: It refers to a Standardized wound pain intensity assessment tool used by the principal investigator. Here, 'V' stands for visual, 'A' refers to Analogue and 'S' stands for Scale.

REEDA Scale: It refers to a Standardized wound healing assessment tool used by the principal investigator. Here, 'R' stands for Redness, 'E' stands for Edema, 'E' refers to Ecchymosis, 'D' refers to Discharge, and 'A' refers to Approximation.

Perineal Care Bundle Sheet: It refers to Standardized tool for using the record of perineal care bundle intervention. It includes patient's name, inpatient number, date and time of perineal care bundle intervention, and signature of person's who provided the care bundle.

Socio-Demographic Variables: It includes age, education of the mothers, occupation of the mothers, monthly family income, religion, area of residence and type of marriage.

Pregnancy Related Information Variable: It includes the haemoglobin level during labour and parity of the mothers.

Age: It refers to recorded as the nearest completed whole number, representing the years lived by an individual.

Primary Education: It refers to the person being referred to had completed their education from the first grade to the fourth grade.

Secondary Education: It refers to a person who has completed standards five through ten, which indeed constitute the secondary education level.

Pre-University Education: It refers to the academic level completed up to the twelfth standard, typically serving as the final stage of secondary education before pursuing higher studies or specialized courses.

Bachelor Level: It refers to the academic phase typically achieved after completing 12 years of schooling, followed by three to four years of undergraduate study leading to the attainment of a bachelor's degree.

Post Graduate Level: It refers to advanced academic phase pursued after obtaining a bachelor's degree, involving specialized study in master's or doctoral programs

Residence: It refers to the primary place where a person lives and sleeps regularly. It includes urban, semi-urban, and rural.

Occupation: It refers to a person's primary employment or means of livelihood, categorized into government service, private service, agricultural work, homemaking (housewives), or other identified means of engagement, forming the basis of their economic activity within our study.

Religion: It refers to a system of beliefs, practices, and values that often involves a higher power or divine being, guiding principles, and rituals shaping individuals' understanding of existence and their place in the world

Marriage: It refers to a culturally and socially recognized union based on mutual commitment, often involving legal, emotional, and familial ties between two individuals**.**

Consanguineous Type of Marriage: It refers to a marital union between individuals who share a familial relationship or blood ties, typically involving marriage between close relatives such as cousins or other family members within a certain degree of consanguinity.

Non-consanguineous Type of Marriage: It refers to a marital union between individuals unrelated by direct blood ties or close familial relationships.

Dietary Patterns: refers to Dietary patterns in this study including individuals categorized as pure vegetarians (abstaining from all meat and animal products), vegetarians who consume eggs, and individuals following a mixed diet incorporating both vegetarian and non-vegetarian foods.

Smoking Habit: It refers to the regular use or consumption of tobacco or related products, such as cigarettes, bidi (hand-rolled cigarettes), pipes, or smokeless tobacco, characterized by the inhalation or ingestion of tobacco smoke or its byproducts into the body.

Alcohol Habit: It refers to the consistent or occasional consumption of alcoholic beverages, including beer, wine, or any other alcoholic drinks, forming a recurring or intermittent pattern in an individual's consumption behavior.

Monthly Family Income: It refers to the total earnings or financial resources received within a household in a calendar month, including salaries, wages, business profits, government subsidies, or any other sources of income, quantified in Indian rupees and inclusive of the income attributed to each person within the household.

Parity: It refers to the number of times a mother has given birth to a fetus or fetus reaching the stage of viability, typically past 20 weeks of gestation, regardless of the outcome (live birth or stillbirth).

Primiparous: It refers to a mother who has given birth to a fetus reaching the stage of viability for the first time, typically beyond 20 weeks of gestation, regardless of the outcome (live birth or stillbirth), indicating a first-time childbirth occurrence**.**

Multiparous: It refers to a mother who has given birth to two or more fetus reaching the stage of viability, typically beyond 20 weeks of gestation, irrespective of the outcome (live birth or stillbirth), indicating multiple childbirth occurrences.

Hemoglobin Level: It refers to the concentration of hemoglobin in the blood, typically measured in grams per decilitre (g/dL) through a blood test, serving as an indicator of the blood's oxygen-carrying capacity.

Anemia: It refers to a medical condition characterized by a lower-than-normal level of hemoglobin with minimal normal value (less than 11.0 g/dl) during delivery.

Preterm Birth: It refers to the delivery of an infant before completing 37 weeks of gestation, calculated from the first day of the last menstrual period to the date of delivery.

Low Birth Weight: It refers to an infant born weighing less than 2,500 grams or 5.5 pounds, regardless of the gestational age at birth.

Birth Asphyxia: It refers to a condition that occurs when a newborn experiences inadequate oxygen supply before, during, or just after delivery, leading to difficulty in breathing and potential neurological complications due to oxygen deprivation.

Post Partum Hemorrhage: It refers to excessive bleeding that occurs during childbirth or within the first 24 hours after delivery, often involving blood loss exceeding 500 ml for a vaginal birth or 1000 ml for a caesarean birth, potentially leading to maternal complications and requiring immediate medical intervention.

Blood Transfusion: It refers to the administration of donated blood or blood products to a woman either during childbirth or in the immediate period after delivery, typically to address severe blood loss or complications requiring additional blood to restore adequate levels.

Health Service: It refers to antenatal care visits.

Practice-Related Variables: It refers to a dietary pattern.

Habit Related Variables: It refers to alcohol and smoking.

1.7 Conceptual Model

A conceptual framework is a theoretical approach that scientifically examines problems, emphasizing the selection, arrangement, and classification of its concepts. It refers to interrelated concepts or abstractions organized in a rational scheme due to their relevance to a common theme. These frameworks serve as springboards for generating hypotheses to be tested.[105]

King describes her model as a conceptual system consisting of three interacting systems: the personal, the interpersonal, and the social system. Within this framework, the nurse and the individual engage in interactions aimed at achieving a common goal.[106] Over time, these interactions culminate in a transaction where the individual's goals are fulfilled. King's Goal Attainment theory is founded upon these concepts:

1. Perception
2. Judgement
3. Action
4. Transaction
5. Evaluation

This study aims to evaluate both the effectiveness of the perineal care bundle intervention and the factors contributing to immediate adverse pregnancy outcomes among mothers admitted to the postnatal and labor wards in a specific tertiary care hospital. Imogene King's Goal Attainment theory serves as the bedrock of this research, fostering collaborative objective-setting with participants. Leveraging Imogene King's theory, a refined conceptual framework has been formulated for this study.

Perception

Perception involves the intricate cognitive process where individuals translate sensory inputs into a unified and coherent framework to comprehend their surroundings. In this investigation, the researcher discovered that among participants in the initial labor stage and postpartum mothers, there was a notably higher occurrence of perineal infections due to insufficient perineal care.

Judgement

The ability to assess, decide, and form judgments in a wise, impartial manner, especially regarding matters influencing action, is crucial. In this study, the researcher assesses the need for specific measures to maintain perineal care among mothers admitted to the labor and postnatal departments of a chosen tertiary care hospital**.**

Action

Each group member makes a decision, followed by subsequent action to achieve the objective. This study delineates two approaches to maintain the perineal care bundle intervention. In the intervention group, a solution comprising 5% betadine (5ml) with normal saline (0.9% sodium chloride, 20ml), along with sterile gauze pads and sanitary pads, is applied. Conversely, the non-intervention group receives instructions for self-perineal care, where participant mothers perform their own perineal care.

Transaction

This process involves individuals interacting with their environment to achieve goals crucial for goal-oriented human behavior. Within this investigation, the effectiveness of the perineal care bundle intervention was assessed using the high vaginal swab culture report, the REEDA scale's outcomes, and the VAS score.

Evaluation

Perineal care bundle intervention will prevent growth of microorganisms. Goal will be attained.

Mutual Goal Setting

The result of this process is goal attainment, a dynamic procedure where individuals or groups choose from visible options with a clear purpose, taking action to solve problems and achieve objectives. In this study, both the researcher and the participants are aware of their specific goals and intended actions. The primary focus of this research is to ensure consistent perineal care among all participants.

Reaction

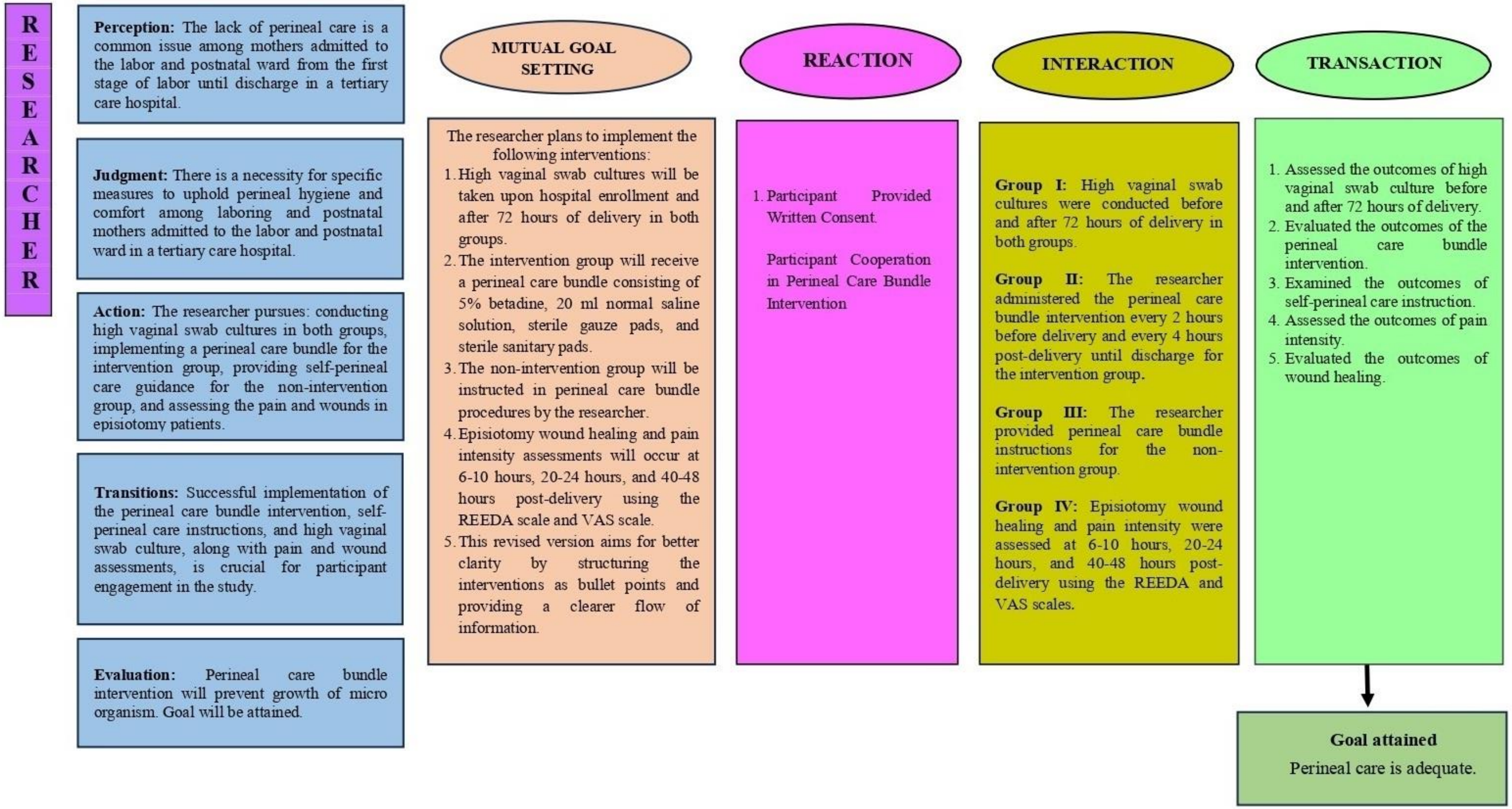
Collaboration represents the core of working toward a common goal. In this study, participants susceptible to perineal discomfort and infections due to inadequate treatment express their concerns to the researcher.

Intervention

Self-perineal care instructions and a perineal care bundle intervention were provided. Pain assessment, using a visual analog scale and the REEDA scale, was conducted at specific time intervals: within the first six to ten hours, twenty to twenty-four hours, and forty to forty-eight hours after delivery.

Goal Attainment

The researcher in this study strives to uphold perineal care. Achieving this objective should lead to improved perineal cleanliness, a high vaginal swab culture report indicating no growth, and lower scores on the VAS and REEDA scales. If the objective isn't achieved, a reassessment occurs, although it's not within the scope of this study.



Perception: The lack of perineal care is a common issue among mothers admitted to the labor and postnatal ward from the first stage of labor until discharge in a tertiary care hospital.

Judgment: There is a necessity for specific measures to uphold perineal hygiene and comfort among laboring and postnatal mothers admitted to the labor and postnatal ward in a tertiary care hospital.

Action: The researcher pursues: conducting high vaginal swab cultures in both groups, implementing a perineal care bundle for the intervention group, providing self-perineal care guidance for the non-intervention group, and assessing the pain and wounds in episiotomy patients.

Transitions: Successful implementation of the perineal care bundle intervention, self-perineal care instructions, and high vaginal swab culture, along with pain and wound assessments, is crucial for participant engagement in the study.

Evaluation: Perineal care bundle intervention will prevent growth of micro organism. Goal will be attained.

MUTUAL GOAL SETTING

The researcher plans to implement the following interventions:

1. High vaginal swab cultures will be taken upon hospital enrollment and after 72 hours of delivery in both groups.
2. The intervention group will receive a perineal care bundle consisting of 5% betadine, 20 ml normal saline solution, sterile gauze pads, and sterile sanitary pads.
3. The non-intervention group will be instructed in perineal care bundle procedures by the researcher.
4. Episiotomy wound healing and pain intensity assessments will occur at 6-10 hours, 20-24 hours, and 40-48 hours post-delivery using the REEDA scale and VAS scale.
5. This revised version aims for better clarity by structuring the interventions as bullet points and providing a clearer flow of information.

REACTION

1. Participant Provided Written Consent.

Participant Cooperation in Perineal Care Bundle Intervention

INTERACTION

Group I: High vaginal swab cultures were conducted before and after 72 hours of delivery in both groups.

Group II: The researcher administered the perineal care bundle intervention every 2 hours before delivery and every 4 hours post-delivery until discharge for the intervention group.

Group III: The researcher provided perineal care bundle instructions for the non-intervention group.

Group IV: Episiotomy wound healing and pain intensity were assessed at 6-10 hours, 20-24 hours, and 40-48 hours post-delivery using the REEDA and VAS scales.

TRANSACTION

1. Assessed the outcomes of high vaginal swab culture before and after 72 hours of delivery.
2. Evaluated the outcomes of the perineal care bundle intervention.
3. Examined the outcomes of self-perineal care instruction.
4. Assessed the outcomes of pain intensity.
5. Evaluated the outcomes of wound healing.

Goal attained

Perineal care is adequate.

Fig-1.8 : The Framework Employed in This Study Draws From Imogene King's Goal Attainment Model (1997) and its Application to Preventing Puerperal Perineal Infection

Feedback (not included in this study)

CHAPTER - 2

REVIEW OF LITERATURE

This section contains a review of literature aligned with the defined objectives of the study. Here, the researcher discusses the literature on perineal care, episiotomy pain, healing, infection, and the determinants of adverse neonatal and maternal outcomes.

2.1. Perineal Care-Related Literature

In the 2022 Malaysian study, 125 primigravida mothers participated, aiming to evaluate the impact of self-perineal care (SPC) education on episiotomy pain scores and wound healing outcomes. The participants were divided into two groups: an SPC education group (n=62) and a control group (n=63). The intervention entailed providing SPC education through a mobile application, alongside routine care, to the education group. Both groups utilized the mobile application to self-report their episiotomy pain scores and wound healing progress for seven days following childbirth. The results consistently demonstrated significantly lower overall pain and REEDA scores in the intervention group compared to the control group throughout the post-delivery week ($P < 0.001$). Consequently, the study concluded that SPC education effectively diminished episiotomy pain and enhanced wound healing outcomes. This underscores the pivotal role of empowering primigravida mothers in their health through comprehensive self-care education.[107]

In South Korea, meticulous perineal hygiene practices during vaginal delivery are crucial. Studies conducted in 2021 aimed to clarify the most effective antiseptic agent for post-episiotomy perineal cleansing. These multicenter randomized controlled trials focused on comparing chlorhexidine-alcohol and povidone-iodine among term pregnant women preparing for vaginal delivery post-episiotomy. The primary objective was to determine the incidence of perineal wound infections within 30 days post-delivery. Additionally, secondary outcomes, including hospital stay duration, post-delivery complications requiring medical attention, and any adverse reactions, were examined. These studies aimed to offer vital insights for selecting the optimal antiseptic agent tailored to South Korean perineal care practices following vaginal delivery.[78]

In 2019, a hospital-based study was conducted at the postpartum unit of Abou Homos General Hospital in the Albehera Governorate, Egypt. The research aimed to evaluate the impact of perineal self-care guidelines on discomfort and recovery following episiotomy among postpartum women. Employing a quasi-experimental research design, 80 postpartum mothers were randomly assigned to either the study or control groups. Data collection utilized three instruments: the standardized REEDA scale, the Pain Intensity Visual Analogue Scale (VAS), and the Sociodemographic and Obstetric Data Sheet. Results indicated a statistically significant difference between the two groups in terms of perineal edema, redness, and episiotomy pain beyond 48 hours postpartum. Notably, postpartum women who received perineal self-care training experienced reduced episiotomy pain and faster healing compared to those without such training. The study suggests that improving women's physical and mental health could be achieved through proper training for healthcare workers.[108]

In 2019, a comprehensive study was conducted at Ain Shams University Maternity Hospital in Egypt to evaluate the comparative efficacy of betadine and normal saline dressings in aiding the healing of episiotomy wounds in postnatal mothers. Using a quasi-experimental design, the study employed simple random sampling to select a sample of 160 postnatal mothers, with 80 receiving normal saline dressings and the remaining 80 treated with a 10% povidone-iodine solution after normal vaginal deliveries with episiotomies. Data collection involved structured interviews, the standardized REEDA scale, and the Visual Analogue Scale (VAS). The findings showcased the positive impact of normal saline in improving the healing of episiotomy wounds, as indicated by lower REEDA scale scores and reduced VAS pain scores. In conclusion, the study emphasized the significant role of normal saline in fostering the healing process of episiotomy wounds among postnatal mothers.[109]

An Iranian study conducted in 2010 aimed to compare the effectiveness of topical phenytoin cream and betadine solution in alleviating discomfort experienced by primiparous mothers after episiotomy incisions. At Al-Zahra Medical Center in Tabriz, 120 primiparous women who underwent episiotomies were randomly assigned, in a double-blind clinical trial design, to either the phenytoin or betadine groups (60 participants in each). Pain intensity was assessed using a visual analogue scale (VAS) within the first twenty-four hours post-delivery and on the tenth day following delivery. The study revealed that within the initial 24 hours postpartum, the mean pain intensity was 4.39 ± 1.11 in the phenytoin group and 7.11 ± 1.48 in the betadine group ($p < 0.001$). On the tenth day postpartum, the mean pain intensity was 0.72 ± 1.04 in the phenytoin group and 3.45 ± 2.00 in the betadine group ($p < 0.001$). The findings suggested that local application of phenytoin effectively reduced episiotomy-related pain, indicating its potential as an alternative to betadine.[110]

A quasi-experimental study, focusing on primiparous women and centered on episiotomy and self-perineal care, was conducted in 2009 at the Ibn AL-Baladi Pediatric and Maternity Hospital in Al-Russafa, Baghdad, Iraq. Sixty primiparous mothers were recruited, with thirty individuals in the intervention group receiving instruction-oriented intervention, while the remaining thirty in the control group did not receive such intervention. The results highlighted a significant improvement in the study group's understanding of episiotomy and self-perineal care after the educational intervention. The majority of mothers successfully met their perineal care needs, employing methods such as using ice packs, baths, dry heat, abstaining from coitus, adhering to proper restroom hygiene, consuming a healthy diet to prevent constipation, exercising pelvic muscles, and receiving follow-up treatment. The study recommends providing educational interventions for all pregnant mothers visiting primary health care centers. Additionally, it suggests that implementing such interventions in hospitals could benefit women who have undergone episiotomies.[111]

A study conducted in Chennai in 2020 aimed to assess the efficacy of betadine wash in treating episiotomy wounds among postnatal mothers. Using a pre-experimental design, the study involved a sample size of 100 participants, with 50 receiving betadine wash and 50 receiving normal saline, selected through simple randomized sampling. The study's findings revealed a statistically significant difference, with a p-value less than 0.001, indicating that betadine wash yielded superior results compared to normal saline. In conclusion, the research demonstrated that betadine wash serves as a more effective intervention in enhancing the healing process of episiotomy wounds in postnatal mothers compared to the application of normal saline.[95]

In 2022, a quasi-experimental study conducted in India aimed to evaluate the effects of medicated and non-medicated sitz baths on the healing of episiotomy wounds in postnatal women. Sixty new mothers were selected using a straightforward random sampling method and divided into two groups: twenty in the first group received a medicated sitz bath (10% Butadiene), and thirty in the second group received a non-medicated sitz bath. Pain was measured using a visual analogue scale, while the healing condition of the episiotomy wound was assessed using the REEDA Scale. The findings indicated that medicated sitz baths were superior to non-medicated ones in providing pain relief and promoting wound healing.[112]

In 2021, a study conducted in Maharashtra, India aimed to assess the effectiveness of a self-instructional module in augmenting knowledge about perineal care among primipara postnatal mothers. Employing a pretest and post-test design, the study evaluated the impact of this module on perineal care knowledge using a combination of inferential and descriptive data analysis techniques. The findings revealed improved perineal hygiene practices among primipara postnatal mothers in the selected Wardha district. These practices were associated with reduced perineal discomfort and lowered infection rates, ultimately contributing to an enhanced quality of life. This improvement complemented other interventions and knowledge provisions, emphasizing the significance of such educational modules in postnatal care.[113]

A study conducted in 2015 within the postnatal wards of St. John's Medical College Hospital and Research Center in Bangalore utilized a quasi-experimental methodology. One hundred postnatal mothers were purposefully selected and divided into two groups: Group 1 received standard care, while Group 2 practiced self-perineal care. Data collection employed the REEDA observation checklist for assessing episiotomy wound healing, along with an additional checklist to evaluate self-perineal care performance. Descriptive and inferential statistics were used for analysis, revealing a significant difference ($p < 0.05$) in episiotomy wound scores between aseptic and self-perineal care on the second and third postnatal days. Additionally, a notable correlation was found between newborn weight and episiotomy wound scores ($p < 0.001$). The self-perineal care group displayed lower wound scores, indicating superior wound healing. This study underscores the efficacy and cost-effectiveness of self-perineal care in enabling postnatal mothers to independently manage perineal care, even at home, thus facilitating improved wound healing.[114]

A study conducted in Angola aimed to address the critical need for improving maternal healthcare and reducing maternal and newborn mortality in alignment with global health priorities. Despite ongoing efforts, Angola continues to grapple with high rates of maternal mortality; in 2015, the country's risk of maternal mortality was 1 in 32. The study's objective was to identify social and demographic factors influencing mothers' receipt of prenatal care, hospital deliveries, and the outcomes of these births. The findings revealed that although 96.8% of mothers received prenatal care and 98.5% gave birth to live children, a staggering 50.7% chose to deliver outside a hospital setting. Analyzing 10,289 pregnancy outcomes involving 8,066 mothers collected by the Dande Health and Demographic Surveillance System between 2009 and 2015, the study highlighted the substantial impact of prenatal care attendance on delivery outcomes. Factors such as age, education, rural residence, and proximity to healthcare facilities significantly influenced healthcare utilization. Consequently, the study concludes that targeted interventions are imperative to enhance maternal healthcare and reduce mother and child mortality rates in Angola. Specifically, addressing disparities in prenatal care and institutional delivery is crucial.[115]

2.2. Episiotomy Wound Healing, Pain, and Infection-Related Literature

A study conducted at Croydon University Hospital in the United Kingdom between August 2020 and August 2021 aimed to investigate the frequency and underlying factors contributing to delayed healing in dehisced perineal wounds. This study involved a secondary analysis of women with perineal wound dehiscence, utilizing advanced diagnostic tools to identify bacterial colonization and measure wound dimensions. The results revealed that, on average, wounds took three weeks to heal, with 69.1% of them healing in less than four weeks. Independent risk factors for delayed healing, such as obstetric anal sphincter injuries (OASI), wound area, and bacterial fluorescence, were identified and integrated into an accurate predictive model. These findings offer valuable insights for healthcare professionals, enabling personalized follow-up therapy based on individual risk factors identified during the initial assessment. Notably, this study is the first to comprehensively describe the healing outcomes of dehisced perineal wounds and the associated factors contributing to delayed healing.[116]

In 2020, a comparative study conducted at Bent Al-Huda Hospital in Bojnourd, Iran, aimed to evaluate the incidence of episiotomy site infection among primiparas, comparing two groups: one receiving prophylactic antibiotics following a typical vaginal delivery and the other without. This double-blind, randomized clinical trial enrolled 140 primiparas, with 70 mothers in each group receiving either cephalexin or placebo capsules. Post-episiotomy, participants took the prescribed medication every six hours for seven days. After seven days post-delivery, a wound healing assessment was conducted using the REEDA scale, measuring redness, edema, ecchymosis, discharge, and wound border approximation. The seventh-day assessment revealed statistically significant differences in healing scores between the antibiotic and placebo groups, with superior wound healing observed in the antibiotic-receiving group. Consequently, the study concluded that prophylactic antibiotics may play a beneficial role in the management of episiotomy wounds. [94]

A 2020 study conducted in Uganda evaluated episiotomy-related morbidities, utilizing parameters such as redness, edema, ecchymosis, discharge, and approximation. Postpartum pain, a common issue, was measured using the Numerical Pain Scale (NPS). The study aimed to compare primiparous mothers who underwent episiotomies at Mulago National Referral Hospital with those who did not, focusing on NPS and REEDA scores during the initial two weeks post-birth. Employing a prospective cohort design, primiparous mothers were systematically recruited on the first postnatal day and categorized based on whether they had undergone an episiotomy. According to the findings, compared to primiparous women without episiotomies, those who underwent the procedure had significantly higher mean total REEDA scores on days 1 and 14, as well as a higher mean NPS on day 14. The study concluded that episiotomy, considered a traumatic obstetric surgery, tends to heal slowly and is associated with prolonged perineal pain compared to spontaneous perineal contusions or tears.[36]

In 2019, a descriptive longitudinal study was conducted at the University of Port Harcourt Teaching Hospital in Nigeria to investigate the prevalence of post-episiotomy complications and their relationship with risk factors. The study included

403 consecutive women who had undergone episiotomies in the labour ward. Assessments were conducted at the postnatal clinic during the 1st and 6th weeks post-delivery, meticulously recording data encompassing various factors such as age, marital status, occupation, educational status, address, parity, booking status, post-episiotomy complications, and associated risk factors. The study revealed an episiotomy rate of 22.1%, with a prevalent occurrence of post-episiotomy complications at 52.1%, accompanied by various associated symptoms. Consequently, the study concluded that addressing these findings is crucial to reduce the incidence of episiotomies and their associated complications, ultimately enhancing the pregnancy experience for women.[117]

A systematic review conducted in 2019 aimed to determine the incidence of wound infection and dehiscence following childbirth-related perineal trauma. The extensive data collection involved searching the Medline, Embase, and Cinahl databases from their inception to September 2018, utilizing MeSH terms, text words, and various word variants. The study's findings revealed a wide range in the incidence of childbirth-related perineal wound infection (ranging from 0.1% to 23.6%) and wound dehiscence (ranging from 0.21% to 24.6%). However, the assessment of the included studies exposed methodological inadequacies. Consequently, the study concluded that despite the variability in reported incidences, there are significant complications related to childbirth-related perineal trauma. It underscores the potential long-term morbidities for affected women and emphasizes the imperative for improved research methodologies and a deeper understanding of the implications of perineal trauma in childbirth.[118]

A triple-blind clinical experiment conducted in 2018 at Tehran University of Medical Sciences examined the impact of hypericum perforatum ointment on perineal pain in primiparous mothers after episiotomy. A total of 42 individuals were randomized to receive either the hypericum perforatum ointment or a placebo, applying it twice a day for ten days. The results indicated that pain scores four hours after applying the ointment and before did not significantly change. However, using hypericum perforatum ointment for eight hours, five days, and ten days resulted in a noticeable reduction in pain. Consequently, the study concluded that hypericum perforatum ointment represents a useful and non-invasive method for treating pain at the episiotomy site.[119]

In 2017, a randomized prospective comparative study was conducted at Kathmandu Teaching Hospital, Nepal, within the Obstetrics and Gynecology Department, to assess the impact of episiotomy on maternal morbidity during first vaginal births. The study randomly assigned participants into two groups: the episiotomy group, where medio-lateral episiotomies were administered, and the no episiotomy group. Maternal morbidity was evaluated immediately after delivery, at six hours, and one week post-delivery. The findings revealed that the no episiotomy group had a higher prevalence of intact perineum. In contrast, the episiotomy group exhibited a higher incidence of third-degree tears, vulval hematoma, wound gaping, and perineal edema. Consequently, the study concluded that routine employment of episiotomy should be discouraged, as it did not reduce morbidities and was associated with increased maternal discomfort, especially in cases of insignificant anterior perineal lacerations and episiotomy site infection.[120]

A study investigating the impact of topical phenytoin cream on wound healing in primiparous mothers was conducted in Iran in 2018. The research recruited a total of 130 primiparous mothers from Qazvin province and employed a clinical trial design, with 65 individuals in both the intervention and control groups at Kowsar Hospital. The intervention group received topical 1% Phenytoin cream alongside 10% povidone-iodine (betadine) solution, while the control group received a placebo and betadine solution. Per hospital protocol, betadine was utilized for wound drainage, with either topical phenytoin or placebo cream applied. Episiotomy repair progress was assessed using the REEDA index on the fifth, tenth, and first days after delivery. Initially, within the first 24 hours, no significant difference was observed between the groups. However, by the fifth day, the intervention group displayed enhanced wound repair, exhibiting a significant difference ($p < 0.001$). This trend persisted on the tenth day, still demonstrating a significant difference ($p < 0.001$) favoring the intervention group. The study's findings suggest that 1% phenytoin cream expedites wound healing, indicating its potential suitability for episiotomy repair.[121]

In 2015, a randomized controlled trial aimed to assess the reliability of the Redness, Edema, Ecchymosis, Discharge, and Approximation (REEDA) scale in evaluating perineal healing subsequent to a right medio-lateral episiotomy during normal delivery. This study involved 54 randomly selected women and was conducted in Brazil. Trained nurses evaluated perineal healing using the REEDA scale at four time points, ranging from 6 hours to 10 days post-delivery. The reliability analysis utilized the kappa coefficient. The findings indicated good agreement in evaluating the discharge item ($0.75 < \text{Kappa} \geq 0.88$) and marginal to good agreement in assessing edema during the first three evaluations ($0.16 < \text{Kappa} \geq 0.46$). Marginal agreement was observed in assessing ecchymosis ($0.25 < \text{Kappa} \geq$

0.42), while redness assessment displayed good agreement ($0.46 < \text{Kappa} \geq 0.66$). Coaptation assessment initially exhibited excellent agreement but decreased to good agreement in the final evaluation. In the fourth assessment, all items demonstrated either excellent or good agreement among evaluators. Consequently, the study's findings underscore variations in scores among evaluators using the scale, highlighting the necessity for improvements to ensure accurate assessment of episiotomy healing.[37]

A 2012 study conducted in Egypt utilized the REEDA scale to evaluate the effects of self-perineal care instructions on wound healing and postpartum discomfort among women. Using a quasi-experimental design, the study divided 80 postpartum women from El-Minia General Hospital into experimental and control groups. Those who received and followed the self-perineal care instructions reported reduced post-childbirth discomfort. The findings revealed a noteworthy decrease in REEDA scores for wound healing in the experimental group, indicating improved recovery. This study underscores the importance of providing perineal care education and training for nursing students, as it contributes to alleviating episiotomy pain and promoting healing in postpartum mothers. Additionally, it emphasizes the necessity for further research in this area.[27]

In 2011, a case-control study was carried out at Sir Salimullah Medical College Hospital and Dhaka Medical College Hospital in Bangladesh to investigate the link between socioeconomic and demographic factors and puerperal infection among postpartum mothers. The study included 105 control participants aged 15 to 40 years, alongside 35 cases meeting WHO criteria for puerperal infection. Analysis of the data revealed a significant correlation between postnatal infection and maternal age below 25 years (OR: 5.22; CI 2.25-12.08) and an education level lower than a secondary school certificate (OR: 3.53; CI 1.59-7.85). Ultimately, the study highlighted the substantial influence of sociodemographic characteristics, including age, education, place of residence, and monthly income, on perinatal infection. To achieve SDG target 3 by 2030, these findings underscore the urgent need for comprehensive government strategies addressing this often overlooked health burden. The proposed strategy should prioritize integrating reproductive health into national programs and strategies.[122]

Episiotomy, a common surgical intervention in the second stage of labour, aims to widen the vaginal opening to facilitate childbirth. While offering maternal advantages such as reduced perineal trauma and pelvic floor issues, it also carries risks, including extended tears and dysfunctions. Postpartum care methods aim to mitigate these risks through practices like cleanliness, Kegel exercises, and perineal care. A recent 2022 study conducted in India has provided new insights into episiotomy care. Among various approaches, infrared lamp therapy and sitz baths have emerged as effective methods for relieving episiotomy pain and aiding wound healing. Infrared lamp therapy applies radiant heat to the wound, promoting pain relief and healing, while sitz baths, involving moist heat application, also offer significant benefits. This review offers comprehensive insights into episiotomy, emphasizing postpartum care and highlighting the efficacy of infrared lamp therapy and sitz baths in alleviating episiotomy-related discomfort and aiding wound recovery.[16]

A study conducted at the Prasuti and Striroga, National Institute of Ayurveda in Jaipur aimed to address complications associated with episiotomy wounds. This single-patient study focused on a 20-year-old postnatal female who presented with episiotomy stitch opening, experiencing pain and discomfort while sitting. The treatment approach involved Panch valkalk watha Prakshalan, Yoni Dhoopan with Haridra and Guggulu, along with the local application of Jatyadi Taila. Additionally, the patient orally consumed Triphala Guggulu tablets twice daily for ten days. Notably, a reduction in pus discharge was observed starting from the second day of treatment. By the seventh day, granulation tissue formation was evident, and complete wound closure was achieved by the tenth day. This case study suggests that the Ayurvedic regimen employed in this instance may offer an effective management approach for episiotomy wounds, promoting healing and alleviating associated symptoms without reported adverse effects.[21]

A study was conducted to assess the prevalence of episiotomies and their immediate complications among mothers delivering at tertiary-level public hospitals in India. Using a prospective approach, data were collected from labour room registers of 18 tertiary care hospitals, encompassing vaginal deliveries, including instrumental deliveries, via a structured proforma. The compiled weekly data from all sites underwent centralized analysis. The odds ratio was employed to compare genital trauma occurrence between mothers who had episiotomies and those who didn't, including both nulliparous and multiparous women. Among 120,243 vaginal deliveries, 63.4% (n=76,305) involved episiotomies. Interestingly, nulliparous women were 8.8 times more likely to undergo episiotomies than multiparous mothers. Reported genital tract injuries included varying degrees of perineal tears, anterior vaginal trauma, vulval/vaginal hematoma, and cervical tears. Notably, the combined rate of third and fourth-degree perineal tears was notably lower among nulliparous mothers who received episiotomies, suggesting potential benefits. However, this study emphasizes the necessity for further assessment of the risks and benefits of episiotomies and their complications within the Indian context, calling for randomized clinical trials for a comprehensive evaluation.[29]

2.3. Determinants of Immediate Adverse Neonatal Outcomes

The 2022 review study, conducted in France, meticulously explores the repercussions of societal disparities on pregnancy outcomes, examining maternal, paternal, and contextual influences on fetal and infant health. Delving into associations between adverse birth outcomes and social determinants such as maternal age, education, marital status, and socioeconomic status, the research underscores the pivotal role of neighborhoods and living environments for pregnant women. Drawing from the frameworks established by the World Health Organization and the Commission of Social Determinants of Health, the study presents a comprehensive conceptual framework outlining the impact of social factors on fetal health and pregnancy outcomes. Its conclusions advocate for health policies that facilitate accessible midwifery services and interdisciplinary support for pregnant women, particularly those from low-income backgrounds.[123]

Between June 20 and August 20, 2021, a cross-sectional study investigated birth asphyxia at the NICU of Ethiopia Community Hospital, involving 409 randomly sampled participants from Harari and Dire Dawa. Data collection comprised card reviews and interviewer-administered questionnaires, revealing that approximately 20.8% of newborns were affected by birth asphyxia (95% CI: 16.4%, 24.6%). The study highlighted increased risks of birth asphyxia among neonates delivered through instrumental means and those born to mothers with conditions such as pregnancy-induced hypertension, Premature Rupture of Membrane, and chorioamnionitis.

Management strategies included endotracheal intubation (15 cases, 17.6%), free oxygen administration (19 cases, 22.4%), and bag-and-mask ventilation (50 cases, 58.8%). This study underscores that birth asphyxia impacted one in every five newborns, emphasizing the critical need for healthcare professionals to strictly adhere to national guidelines for neonatal and obstetric care. Additionally, minimizing instrumental deliveries and ensuring optimal management of conditions like PIH, PROM, and chorioamnionitis are crucial strategies.[124]

A systematic review and meta-analysis of twenty-five studies conducted in Bangladesh in 2020 revealed a significant association between maternal anemia and adverse perinatal outcomes in Asian countries. The study noted increased odds of low birth weight (OR, 1.90; 95% CI, 1.06-2.60, $p < 0.05$), preterm delivery (OR, 1.96; 95% CI, 1.20-2.41, $p < 0.05$), and perinatal mortality (OR, 2.90; 95% CI, 1.97-3.78, $p < 0.05$) among anemic mothers. These findings underscore the heightened risk of adverse birth outcomes in women with anemia, emphasizing the crucial need to improve maternal nutritional status and advocate for iron supplementation.[125]

A systematic review and meta-analysis were conducted in 2018 by the Department of Health at Feira de Santana State University in Bahia, Brazil. This study aimed to explore the link between maternal anemia and low birth weight. The research, without language or publication date restrictions, involved an exhaustive search across major databases, gray literature sources, and reference lists from specific papers. Cohort and case-control studies meeting the inclusion criteria were meticulously chosen, and data extraction was independently performed by two reviewers. Incorporating data from 68 papers, the meta-analysis unveiled a significant association between maternal anemia and low birth weight, demonstrating an adjusted odds ratio (OR) of 1.23 (95% CI: 1.06–1.43), with an observed I2 of 58%. Meta-regression analyses hinted at potential partial explanations for the statistical heterogeneity based on sample size and methodological quality. The study conclusively identified maternal anemia as a risk factor for low birth weight, highlighting the imperative nature of treating anemia during pregnancy to improve infant health.[126]

In 2019, a study was conducted among postnatal mothers in Dar es Salaam, Tanzania, to assess the determinants of adverse neonatal outcomes. Employing a case-control study design, the research involved the selection of three medical facilities to form a sample consisting of 165 women who had received prenatal care (ANC), undergone labor and delivery, and received postpartum care. The chi-square test results revealed significant associations between certain factors and poor newborn outcomes, notably malaria (P-value, 0.001 < 0.05), HIV status (P-value, 0.000), and gestational age (P-value, 0.01). The study concluded by emphasizing the imperative need for community-based intervention studies to enhance newborn survival.[127]

A case-control study was conducted at Jimma University Teaching Hospital in Ethiopia to investigate the determinants of adverse pregnancy outcomes among mothers who gave birth in the hospital. The study aimed to assess these determinants among postnatal mothers. The sample consisted of 344 participants randomly selected, with 86 mothers in the case group and 258 in the control group. The study's findings revealed that 80.2% of mothers in the case group fell within the 20-34 age bracket. Unfavorable pregnancy outcomes were found to be over five times more prevalent among mothers referred for safe delivery services from another source. Additionally, the case group exhibited a sevenfold higher incidence of illness among pregnant mothers compared to the control group. Moreover, mothers attending regular ANC visits were 83% less likely to experience adverse pregnancy outcomes compared to those who did not receive prenatal care.[128]

In Ethiopia, a prospective case-control study was conducted between February 15 and April 15, 2020, to examine variables affecting delivery outcomes among mothers in public hospitals. The study involved 495 participants, comprising 165 cases (mothers with negative delivery outcomes) and 330 controls (mothers with normal outcomes). Data were collected through standardized interviews and extraction from medical records. The collected data were analyzed using multivariable logistic regression, with a significance level of p-value < 0.05. The results revealed significant associations between various factors and adverse delivery outcomes. These factors included inadequate dietary supplements, early rupture of membranes, anemia, pregnancy-induced hypertension, low prenatal care visits, and experiencing physical abuse during pregnancy. The study highlighted the crucial role of healthcare professionals in enhancing prenatal care, providing counseling, ensuring appropriate dietary supplementation, and addressing violence during pregnancy to mitigate adverse birth outcomes in Ethiopian public hospitals.[74]

In Qatar, a community-based cohort study was conducted to explore the socioeconomic and demographic factors influencing preterm births (PTB) in comparison to full-term births. The study analyzed data from 59,308 births registered in the mother newborn registry during 2011, 2012, 2017, and 2018. Various socioeconomic factors, such as maternal nationality, religion, education, occupation, family income, housing, consanguinity, early childbearing, high-risk pregnancies, smoking habits, assisted conception, prenatal care, and delivery location, were assessed concerning preterm births. The study reported a 9% prevalence of preterm births. Notably, preterm births were more prevalent among working mothers (40% vs. 35%), those with high-risk pregnancies (24% vs. 18%), users of assisted conception (18% vs. 3%), individuals lacking proper prenatal care (11% vs. 5.6%), and deliveries at tertiary hospitals (88.5% vs. 84.5%) – all with p-values < 0.001. Furthermore, compared to the term birth group, the preterm birth group had a higher percentage of mothers who smoked during pregnancy (0.8% vs. 0.5%, p = 0.030) and more mothers from rural areas (41% vs. 38%, p = 0.01). However, no significant differences were found between the two groups concerning adolescent pregnancy, monthly family income, education level, or religion. This comprehensive study highlights the influence of diverse socioeconomic and healthcare-related factors on the prevalence of preterm births in Qatar.[129]

Between 2010 and 2017, a comprehensive case series was undertaken at a European maternity hospital to explore the connection between maternal employment and pregnancy outcomes, particularly focusing on socioeconomic variables linked to adverse feto-maternal consequences. The study employed structured interview questionnaires, self-reported sociodemographic data, and meticulous examination of medical records to collect data. In total, 62,395 participants were involved, comprising 39.3% nulliparous and 70.7% multiparous women. Notably, 72.2% of participants were employed, while 8.0% were unemployed. Noteworthy findings emerged, revealing that unemployed women demonstrated higher rates of stillbirth, whereas homemakers experienced an increased incidence of neonatal mortality. Significantly, the study's conclusion highlighted that mothers with lower to middle socioeconomic status encountered amplified risks concerning adverse perinatal outcomes. Lifestyle choices, health-seeking behaviors, individual habits, and employment status all emerged as crucial factors influencing the outcomes of pregnancy.[130]

A cross-sectional study conducted in Geneva sought to assess the prevalence and factors contributing to alcohol and tobacco use among pregnant women. The investigation involved data collection through semi-structured interviews with 207 women post-delivery at Geneva University Hospital in 2013. The study revealed a notable decline in smoking prevalence among pregnant women, dropping from 31.2% before pregnancy to 21.7% during pregnancy, with 9.2% continuing post-pregnancy. The presence of a partner who smoked significantly correlated with maternal smoking habits. Additionally, 36.3% of pregnant participants reported alcohol consumption during pregnancy, whereas 62.7% had consumed alcohol occasionally before pregnancy. Intriguingly, the study highlighted that 10% of women who delivered at the hospital had a history of alcohol and tobacco use. Notably, the research emphasized the substantial impact of tobacco and alcohol use during pregnancy on its outcomes, particularly underscoring the influential role of the attitudes and behaviors of close acquaintances on birth outcomes. The study's insights signify the importance of addressing social influences in preventing substance use during pregnancy.[131]

In 2007, a comprehensive study conducted in South and North Dakota, USA, focused on identifying predictive markers for alcohol consumption during pregnancy, employing a drug use screening tool. The research encompassed 4,828 expectant mothers recruited from prenatal clinics in North Dakota, South Dakota, and Montana. The selection of clinic locations aimed to represent varied population distributions and geographic factors. Through univariate and multivariate statistical analyses, the study identified several significant predictive factors associated with alcohol consumption during pregnancy. Notably, unmarried status, age between 21 and 25 years, having fewer children, a history of past abortions, and unemployment were linked to higher rates of alcohol intake during pregnancy. Conversely, being married and engaged in full-time homemaking appeared as protective factors against alcohol consumption during pregnancy. Furthermore, the study highlighted several other risk factors associated with maternal alcohol consumption, including experiences of physical or sexual abuse, tobacco and other drug use, cohabitation with substance-abusing family members, and having partners with substance abuse issues. The study concluded by emphasizing the critical importance of alcohol screening among this demographic to mitigate potential adverse birth outcomes.[132]

Distinct groups based on specific sociodemographic criteria. Those in Class 1, characterized by factors like low socioeconomic status, early marriage, multigravida status, and one or more children, exhibited increased odds of experiencing PTB (adjusted Odds Ratio (OR): 1.77, 95% Confidence Intervals (CI): 1.05-2.97) compared to Class 4 individuals—marked by higher socioeconomic status, later marriage, primigravida, and no children. Similarly, mothers in Class 2, denoting low socioeconomic status, later marriage, primigravida, and no children, displayed higher odds of delivering LBW infants (OR: 2.52, 95% CI: 1.51-4.22) in contrast to Class 4 mothers. Additionally, significant factors contributing to these outcomes included maternal age, hypertension, and a history of previous LBW infants. The study emphasized the urgent need for targeted government interventions addressing disparities in PTB and LBW infants within rural Mysore, India. The research's focus on sociodemographic elements illuminates crucial avenues for intervention strategies aimed at improving birth outcomes.[133]

In Mumbai, India, a comprehensive study in 2023 examined the correlation between low birth weight (LBW) and preterm birth (PTB), drawing from data provided by the National Family Health Survey (NFHS-5) and encompassing 170,253 recent births across India. The findings revealed substantial geographical disparities: 12% of infants experienced LBW, and 18% were affected by PTB between 2019 and 2021. Several critical determinants were identified for adverse delivery outcomes, including maternal stature, prior caesarean deliveries, and inadequate prenatal care. A notable discovery emerged: mothers in higher wealth quintiles displayed a heightened susceptibility to LBW, while those in lower quintiles faced an increased likelihood of PTB. This study highlights the urgent need to bolster prenatal care services to mitigate PTB and LBW rates in India. By shedding light on regional disparities and socioeconomic factors, this research underscores pivotal pathways for improving prenatal care and reducing adverse birth outcomes.[134]

In 2021, a study conducted at UPUMS, Saifai, Etawah, a rural tertiary care hospital in Uttar Pradesh, India, aimed to investigate the prevalence and factors contributing to low birth weight (LBW) among newborns delivered in the year 2018. The research focused on pregnant women who delivered between January 1 and December 31, 2018, totaling 7,615 births, with 53.2% being males and 46.8% females. The mean birth weight was 2.65 ± 0.52 kg, with 32% of babies born preterm and 68% born at term. Notably, 23% of newborns were classified as having low birth weight. The study found significant correlations between birth weight and maternal age, parity, and gestational length. Conclusively, the study emphasized the importance of early identification of high-risk factors, preventing premature deliveries, enhancing antenatal care utilization, and managing associated risk factors to potentially reduce the incidence of low birth weight.[135]

In 2021, a population-based cross-sectional analytical study was conducted in Nashik District, India, aiming to assess pregnancy outcomes and associated risk factors in both tribal and non-tribal populations. The study included 9,307 mothers, comparing two tribal and two non-tribal blocks to estimate the prevalence of pregnancy outcomes and analyze the relationship between specific risk factors and adverse outcomes. The findings indicated varying rates of unfavorable pregnancy outcomes, with 1.7% for stillbirth, 4.1% for preterm delivery, 13.2% for low birth weight, and 2.8% for congenital physical defects. Factors such as residing in a tribal region, pre-existing maternal illnesses, and extensive work during the final six months of pregnancy were significantly linked to low birth weight. The study emphasized the importance of maternal behaviors like smoking and strenuous work during pregnancy, parental consanguinity, and existing maternal illnesses in determining optimal pregnancy outcomes.[40]

In rural West Bengal, India, population-based data from the health and demographic surveillance system (HDSS) were employed to explore risk factors associated with preterm birth and small for gestational age infants. This study utilized the HDSS pregnancy cohort data, involving 2,430 pregnant women. Among these pregnancies, 38.2% resulted in infants classified as small for gestational age, while 16% were preterm births. The findings revealed a noteworthy association between higher maternal education levels (11 years) and a decreased incidence of preterm births. Additionally, there was a correlation indicating a reduced risk of preterm births and a higher occurrence of small for gestational age infants among wealthier individuals (p-value for trend < 0.05). The study highlighted the significance of improving the educational and economic status of low-income mothers to alleviate the substantial burden of preterm births and small for gestational age infants.[136]

In rural Maharashtra, India, a prospective observational study in 2018 aimed to track the prevalence trends of anemia and low body mass index (BMI) among pregnant women in Eastern Maharashtra. Spanning from 2009 to 2016, the study enrolled 72,750 women across catchment regions of 20 rural primary health facilities in four districts in Eastern Maharashtra State. The investigation unveiled a substantial prevalence of underweight and anemia among pregnant women. Mild anemia during childbirth escalated the chances of delivering low birth weight babies, stillbirths, and neonatal mortality, while moderate/severe anemia further increased these risks. Pregnancy-related underweight also elevated the risk of low birth weight and neonatal mortality. The coexistence of anemia and underweight amplified the likelihood of stillbirths, neonatal deaths, and low birth weight newborns. Conversely, being obese or overweight during pregnancy reduced the probability of delivering low birth weight babies but raised the risks of delivery complications for the mother, necessitating a caesarean section. The study's findings underscored the connection between maternal anemia and the increased risk of low birth weight, stillbirths, and neonatal mortality, especially when these conditions co-occurred.[137]

In Guwahati, India, a case series study was undertaken in 2017, focusing on the risk factors associated with low birth weight in mothers. The study aimed to evaluate the correlation between maternal risk factors and the occurrence of low birth weight babies. Employing a random sampling method, the study involved 400 full-term newborns as the sample size. Among them, 165 babies were born with low birth weights, while 235 had normal birth weights. Significant associations were observed between maternal risk factors and full-term low-birth-weight babies. Maternal age, weight, and existing medical conditions emerged as primary contributors to low birth weight. Furthermore, social, economic, and educational factors demonstrated an impact on the incidence of low birth weight newborns. The study concluded that most of these factors are modifiable and preventable, emphasizing the potential for intervention to reduce the prevalence of low birth weight among newborns.[138]

In Assam, India, a longitudinal study was conducted to compare the morbidity pattern between low birth weight (LBW) and normal birth weight (NBW) newborns and assess LBW newborns' health status over their initial six months. The study findings revealed that 77% of LBW newborns suffered from moderate to severe undernutrition. Among LBW infants, acute respiratory tract infection (ARI) emerged as the most prevalent morbidity. Over the follow-up period, LBW newborns also experienced episodes of fever, skin problems, ear disorders, and diarrhoea. Remarkably, LBW infants were hospitalized more frequently (65%) compared to NBW newborns (35%). The study concluded that LBW babies exhibited a higher incidence of morbidities throughout the initial six months of life compared to their NBW counterparts, with ARI being the predominant health issue among LBW infants.[139]

The study harnessed the dataset from India's National Family Health Survey-5 (NFHS-5) conducted between 2019 and 2021, delving into 209,223 births to pinpoint instances of low birth weight (LBW) newborns, defined as infants weighing under 2,500 grams. Its focus lay in uncovering LBW prevalence and influential factors across various residential (rural–urban) and regional landscapes in India. National findings disclosed an 18.24% LBW rate, noticeably higher in rural settings (18.58%) versus urban locales (17.36%). Moreover, specific rural regions in the west (20.63%) and central areas (20.16%) reported elevated occurrences. Noteworthy trends emerged among maternal age groups, revealing reduced live birth rates in mothers aged 25–34, especially in eastern and southern India versus those aged 35–49. The correlation between unwanted pregnancies and higher LBW risks was evident, barring the eastern region. Home births in select rural zones (central, northern, and southern) amplified the likelihood of LBW compared to hospital births (AOR = 1.19, CI: 1.12–1.28, $p < 0.001$). Throughout all regions, lower household income and maternal education levels were associated with LBW. The study advocated for tailored interventions, addressing LBW considering regional disparities and specific contributing factors.[140]

The study conducted at the Medical Institute of Medical Sciences in Telangana, India, aimed to assess preterm deliveries, identify associated risk factors, and evaluate their impact on perinatal outcomes. This retrospective case-control study, spanning January to December 2019, included 383 neonates, comprising 248 full-term and 135 preterm births (occurring before 37 weeks). Various risk factors were linked to the study's 10.86% prevalence rate of preterm birth, including a history of previous preterm birth, prior caesarean section, short interpregnancy intervals, hypertension, premature rupture of membranes, oligohydramnios, and multiple pregnancies. The study's findings suggest that interventions addressing conditions like oligohydramnios and hypertension, coupled with improved healthcare for expectant mothers, could potentially reduce preterm birth rates and improve perinatal outcomes.[141]

The retrospective study, conducted at Kasturba Maternity Hospital in Jagatai, Gujarat, spanning January 2012 to June 2019 and examining 32,557 deliveries, aimed to assess factors influencing preterm deliveries in rural India. Findings over the seven-year period indicated non-tribal preterm deliveries at a rate of 13.9%, while tribal preterm deliveries were higher at 19.7%. Correlations, presented without specific odds ratios, revealed associations: tribal status (with an increased risk), maternal and paternal illiteracy, hemoglobin levels below 10 g/dL, and lack of prenatal care were significantly correlated with preterm births. Notably, low hemoglobin levels and inadequate prenatal care emerged as critical clinical factors posing risks for premature deliveries in rural India. The study underscores the necessity for targeted interventions addressing these factors to effectively reduce the incidence of preterm births in such settings.[142]

In Manipur, a community-based cross-sectional study was conducted among postpartum Meitei mothers. The study, involving 126 postpartum mothers, categorized them based on gestational age: preterm (before 37 weeks) and term (at least 37 weeks) deliveries of singleton live-born infants. Univariate analysis compared the data, and multivariate logistic regression explored the relationship between socioeconomic characteristics and preterm birth, identifying a 23.01% prevalence of preterm births, with 13.79% classified as extremely preterm. Significant correlations emerged between preterm delivery and early menarche age, smoking during pregnancy, family history of preterm birth, and the mother's occupation. The study underscores the necessity for community-specific research to comprehend the diverse risk factors linked to preterm delivery, reduce early childhood deaths, and support women's reproductive health.[143]

In Karnataka, India, an observational, population-based study aimed to evaluate factors contributing to newborn mortality in low-resource settings. The study revealed that between 2014 and 2018, the neonatal mortality rate was 24.5 per 1,000 live births. Primary causes of neonatal deaths within 28 days included prematurity (27.9%), birth asphyxia (25.1%), infections (23.7%), and congenital anomalies

(18.4%). The research highlighted that having four or more antenatal care (ANC) visits correlated with a reduced risk of neonatal death compared to having fewer than four ANC visits.[144]

A longitudinal study conducted in Bihar, India, between 2015 and 2017 aimed to address high maternal and neonatal mortality rates through the AMANAT program implemented in 22 District Hospitals. This program focused on improving the diagnosis and management of postpartum hemorrhage (PPH), hypertensive disorders of pregnancy, birth asphyxia (BA), and low birth weight (LBW). Medical professionals underwent training, participated in simulations and teamwork activities, and received infrastructure and management support. The analysis covered 11,259 non-referred cases and 11,800 total admissions, revealing stable PPH diagnoses at 3.7%, while hypertensive disorders increased from 1.0% to 1.7%. LBW diagnoses rose significantly from 11% to 16%, indicating an increasing trend. Treatment patterns showed improvement, including increased Tranexamic Acid (TXA) administration for PPH and enhanced initial care for BA neonates. However, challenges persist in accurately diagnosing PPH and hypertensive disorders, highlighting ongoing barriers to reducing maternal morbidity and mortality in the region.[145]

The study, based on data from the 2015–2016 Indian Demographic and Health Survey, aimed to evaluate the impact of institutional deliveries on neonatal and maternal health outcomes in rural India. Utilizing an instrumental variable approach to mitigate selection bias, the research focused on a road upgrade program as a quasi-random factor influencing access to healthcare facilities. The analysis revealed a substantial 13 percentage point increase in institutional deliveries in connected villages compared to unconnected ones, especially in public hospitals, notably among women with lower education levels and from poorer households. However, despite the rise in institutional deliveries, there was no observable improvement in neonatal mortality rates or postpartum complications. The study suggests that while promoting institutional deliveries is essential, solely increasing deliveries in healthcare facilities may not directly translate into improved health outcomes. Therefore, efforts to enhance healthcare quality alongside encouraging institutional births are vital for enhancing neonatal and maternal health in low and middle-income countries.[146]

The study conducted in a tertiary care referral hospital in northern India meticulously analyzed newborn health indicators, mortality, and morbidity patterns to shape future interventions. Over the 2018–2020 period, 1749 live-born babies were scrutinized, revealing a neonatal mortality rate of 6.29%. Preterm births constituted 5.83% of cases, with a mortality rate of 7.84%, signifying prematurity as the primary cause of death. Birth asphyxia impacted 5.26% of newborns, resulting in a mortality ratio of 4.35%. Additionally, 13.32% experienced low birth weight, largely within the 2000–2499 g range. Preventive measures achieved a 100% success rate in averting hypothermia. However, a concerning surge in hyperbilirubinemia was observed during severe winter months from December 2018 to February 2019. This study underscores the critical need for targeted interventions, especially in addressing prematurity and birth asphyxia, to substantially enhance neonatal health outcomes.[147]

The study utilized India's Fifth National Family Health Survey (NFHS-5) conducted between 2019 and 2021 to assess the efficacy of risk-based stratification in directing women to suitable birthing facilities. In this analysis of nearly 176,699 recent pregnancies, it was observed that 46.6% of newborn deaths and 56.3% of stillbirths occurred among women categorized as 'low risk.' Surprisingly, despite being classified as 'low risk,' these women underwent Caesarean sections at a rate of 8.4%, merely slightly lower than the national average of 10.0%. Alarmingly, approximately 32.0% of deliveries across India took place in facilities lacking advanced services, displaying significant variations among states. The study highlighted the inadequacy of individual risk stratification in accurately predicting delivery complications and adverse outcomes. Therefore, assigning women as 'low risk' should not guide them to facilities lacking essential life-saving services. The findings underscore the critical need to ensure universal access to vital services like Caesarean sections, blood transfusions, and advanced newborn care, regardless of risk classification.[148]

A community-based study was carried out in Haryana province, India, with the aim of assessing the prevalence of low birth weight (LBW) and identifying associated factors. This study, conducted between June 2015 and May 2016, enrolled 800 mothers from ten randomly selected sub-centers using simple random sampling. The findings revealed a 17% prevalence of LBW cases. Several factors strongly correlated with low birth weight in India, including the baby's gender, household type, maternal occupation and education, intake of iron and folic acid, and instances of anemia. The study emphasized the potential impact of adequate supplementation of iron and folic acid, coupled with proper management and health education, in potentially reducing the incidence of LBW.[149]

2.4. Determinants of Immediate Adverse Maternal Outcomes

The 2023 study conducted in Ethiopia focused on evaluating severe postpartum hemorrhage (PPH) among 728 caesarean deliveries, a critical obstetric concern contributing significantly to maternal mortality. Its objective was to assess the incidence rates and predictive factors associated with severe PPH. Analysis of medical records uncovered a 3.6% incidence of severe PPH. Several factors were independently linked to this complication, including multiple previous caesarean scars, antepartum hemorrhage, severe preeclampsia, maternal age ≥ 35 years, general anesthesia, and classic incision. The study emphasized the elevated risk of severe PPH in caesarean deliveries, underlining the urgent need for tailored interventions, like appropriate uterotonic agents and less invasive hemostatic measures, to effectively manage severe PPH and reduce associated morbidity among caesarean delivery cases in Ethiopia.[150]

In 2022, an Egyptian study investigated the effects of moderate maternal iron deficiency anemia on maternal and fetal health outcomes. Conducted at Masryeen General Hospital, the prospective cohort study involved 100 expectant women. Participants were categorized into two groups based on their hemoglobin levels: Group 1 comprised non-anemic pregnant women with hemoglobin levels of 11 g/dl or higher, while Group 2 consisted of pregnant women with moderate iron deficiency anemia, presenting hemoglobin levels ranging from 7 to <10 g/dl. The study aimed to assess various outcomes including newborn weight, APGAR scores, atonic postpartum hemorrhage, and infections. Demographic differences were noted between the groups, with a higher proportion of individuals with moderate anemia residing in rural areas. Results revealed higher rates of atonic postpartum hemorrhage, postpartum endometritis, post-surgery wound infection, and episiotomy wound infection in the anemic group compared to the non-anemic group. Positive associations were found between maternal characteristics and fetal outcomes, while negative correlations were observed between maternal total iron binding capacity and fetal outcomes. The study's findings underscored the significant impact of maternal iron deficiency anemia on both maternal and fetal health, emphasizing the importance of managing anemia during pregnancy for improved outcomes.[151]

A facility-based cross-sectional study was conducted in two health facilities in Northwest Ethiopia from March to May 2021 to evaluate postpartum anemia and its related factors among postnatal women. A total of 282 postnatal women were included, and data on sociodemographic, obstetric, and clinical factors were gathered using a semi-structured questionnaire. Venous blood samples were collected for the examination of red blood cell parameters. The study revealed that 47.16% of postpartum women experienced anemia, with 45.11% having moderate anemia, 42.86% mild, and 12.03% severe anemia, primarily of the normocytic normochromic type. Factors such as postpartum hemorrhage, caesarean sections, inadequate dietary diversity, and insufficient iron and folate supplements during pregnancy were associated with postpartum anemia. These findings highlight the public health significance of postpartum anemia and emphasize the need for strategies including improved management of postpartum hemorrhage, appropriate caesarean section practices, and enhanced iron and folate supplementation throughout pregnancy to address this concern.[152]

In Dhaka, a review focused on comparing the efficacy of intravenous (IV) iron sucrose and blood transfusion in improving hematological parameters among postpartum women with moderate anemia (Hb 7–8 g/dl). This non-randomized, quasi-experimental study, conducted from January to June 2021, involved forty-four hemodynamically stable postpartum women at Dhaka Medical College Hospital, divided into two groups. One group received two units of blood transfusion over two days, while the other received 600 mg of IV iron sucrose over three days, both administered 48 hours after delivery. After six weeks, both groups showed significant increases in Hb levels, with the blood transfusion group experiencing a 4.5 g/dl increase and the IV iron sucrose group showing a 4.2 g/dl increase. Serum ferritin levels and various hematological indicators also notably improved, with no discernible differences between the two groups. The study concluded that IV iron sucrose effectively replenished hemoglobin and iron reserves in hemodynamically stable women with moderate postpartum anemia, presenting a viable alternative to blood transfusions, especially in resource-limited settings.[153]

In a retrospective comparative study spanning two years (2021) at a tertiary center in Nepal, researchers compared 82 elderly primigravidae with 164 younger primigravidae, focusing on obstetric, postpartum, and perinatal outcomes in these groups. The elderly primigravidae, with an average age of 36.8±2.16 years, exhibited higher incidence rates of preterm labour, gestational diabetes, hypertensive disorders, multiple pregnancies, and polyhydramnios ($p < 0.05$). Additionally, elective caesarean sections were more frequent in the elder group. While perinatal mortality rates remained relatively stable, postpartum hemorrhage was more prevalent among elderly primigravidae. The study highlights the significant impact of maternal age on pregnancy outcomes, stressing the importance of close monitoring and recognizing elderly primigravidae as a high-risk group.[154]

In a 2019 Swedish study titled 'Incidence and risk factors of transfusion reactions in postpartum blood transfusions,' researchers investigated transfusion reactions following pregnancy, comparing their prevalence in postpartum and non-pregnant women. The cohort study involved 517,854 women who gave birth in

Stockholm County between 1990 and 2011, of which 2.4% received blood transfusions. Among them, 96 postpartum transfusion reaction occurrences were recorded, resulting in a prevalence of 79 per 10,000, whereas non-pregnant women had a prevalence of 40 per 10,000 (odds ratio: 2.0; 95% confidence interval: 1.6-2.5). The study identified preeclampsia as the most significant risk factor for transfusion reactions (odds ratio: 2.1; 95% confidence interval: 1.7-2.6). Highlighting the increased risk of transfusion ractions during pregnancy, the study concludes that cautious consideration should be given to blood transfusions for postpartum women with preeclampsia.[63]

This retrospective study, utilizing data from the United States Vital Statistics Records covering deliveries between January 2015 and December 2019, aimed to examine the relationship between Gestational Diabetes Mellitus (GDM) and maternal as well as neonatal health outcomes. Analyzing 1,212,589 GDM-related deliveries out of a total of 19,249,237 deliveries during the study period, it was found that GDM accounted for 6.3% of all deliveries. The cohort of women with GDM comprised 46.4% Non-Hispanic Whites, 11.4% Non-Hispanic Blacks, 25.7% Hispanics, and 16.5% from other racial/ethnic groups, with a median age of 31 years. The cesarean section rate among these women stood at 46.5%. Notably, GDM independently predicted various adverse outcomes including caesarean section, maternal blood transfusion, intensive care unit admissions for both mothers and neonates, assisted ventilation, and low 5-minute Apgar scores (OR range: 1.01-1.53). This underscores GDM's significant role as a standalone risk factor for adverse maternal and neonatal outcomes, underscoring the critical need for early identification and effective management during pregnancy.[155]

In South Korea, a study investigated the influence of socioeconomic status on pregnancy outcomes following the implementation of a prenatal care support system accessible to all expectant mothers, regardless of their socioeconomic background. The research utilized the National Health Insurance (NHI) database, focusing on births occurring from January 1, 2010, to December 31, 2010. The study classified participants into two groups: NHI beneficiaries, representing the "middle/high" socioeconomic bracket, and Medical Aid (MA) recipients, symbolizing the "low" socioeconomic level. Findings from the database analysis unveiled that the MA group had notably higher rates of inadequate prenatal care (29.4% vs. 11.4% in the NHI group). Moreover, the MA group exhibited elevated occurrences of adverse pregnancy outcomes including abortions (30.1% vs. 20.7% in the NHI group), preterm deliveries (2.1% vs. 1.4% in the NHI group), obstetric hemorrhage (4.7% vs. 3.9% in the NHI group), preeclampsia (1.5% vs. 0.6% in the NHI group), and Caesarean deliveries (45.8% vs. 39.6% in the NHI group). These findings indicated significantly poorer pregnancy outcomes in the MA group across multiple measures, emphasizing the need for health officials to investigate and address barriers contributing to these disparities in order to improve overall maternal and fetal health.[156]

In Bangladesh, an investigation analyzed data obtained from the Bangladesh Maternal Mortality Surveys (BMMS) conducted in 2001, 2010, and 2016, focusing on maternal deaths attributed to hemorrhage. The study revealed a consistent proportion of maternal deaths associated with hemorrhage over these years, comprising 31% (95% CI= 24-38) in the 2016 survey, mirroring percentages observed in 2010 (31%) and 2001 (29%). Despite this, the mortality rate from hemorrhage remained relatively stable, with 60 per 100,000 live births in 2010 and 53 per 100,000 live births in 2016.

Concerningly, nearly 70% of these fatalities occurred within 24 hours post-delivery, with 24% of affected individuals not seeking any external healthcare and 15% seeking care from multiple sources. Moreover, a significant majority, approximately two-thirds, of the women who succumbed to hemorrhage had delivered at home. These findings emphasize the critical necessity of raising community awareness and improving childbirth care-seeking practices to prevent avoidable maternal deaths resulting from postpartum hemorrhage in Bangladesh.[157]

In Canada, more than 100,000 babies are born into poverty annually. Pregnant women navigating situations like single parenthood, teenage pregnancy, unemployment, and inadequate living conditions face significant challenges. The intersection of pregnancy and poverty results in adverse health effects impacting newborns throughout their lives. These include heightened risks of preterm birth, intrauterine growth restriction, and increased newborn or infant mortality. Extensive research consistently links poverty to delayed cognitive development and lower academic achievements in children. Maternal poverty also correlates closely with behavioral issues in young children and adolescents. Despite the evident correlation, conclusive evidence supporting laws and initiatives targeting poverty-related inequalities, particularly in healthcare, remains elusive. This challenge partly arises due to inadequate assessment or scrutiny of various initiatives aimed at aiding the impoverished.[158]

Between July 2018 and June 2019, a study in India focused on expectant mothers and those who had given birth within a week, aiming to evaluate blood transfusion requirements, prevalence, associated risk factors, and the role of prenatal checkups. Among 5,486 patients, 543 (9.89%) required blood transfusions, primarily due to anemia during pregnancy (39.96%) and postpartum hemorrhage (21.54%). Transfusion reactions were observed in 5.34% of cases. These findings stress the need to improve access to and awareness of blood transfusions. They highlight the importance of routine prenatal assessments for monitoring hemoglobin levels and identifying high-risk individuals. Additionally, active management during the third stage of labor is critical to minimize blood loss. Despite efforts, frequent demand for blood transfusions persists due to anemia and postpartum bleeding, emphasizing the necessity for prompt management strategies.[159]

In a comprehensive 2020 systematic review encompassing 41 articles from India, the primary aim was to discern the multifaceted societal variables influencing maternal health within the country. This extensive study brought to light a spectrum of factors intricately intertwined with pregnancy outcomes. These included variables ranging from women's exposure to mass media and awareness of maternal health to socio-economic status, encompassing societal, cultural, and demographic aspects such as caste/ethnicity, gender, religion, age at childbirth, occupation, place of residence, and parity. The review emphatically advocates for the equitable and efficient dispersion of healthcare services, emphasizing the imperative need for enhanced governmental planning and policy-level interventions to effectively diminish maternal mortality rates.[160]

A 2022 study in Gujarat, India, aimed to assess anemia prevalence, access to antenatal and postnatal care (ANC and PNC) services, and determinants influencing anemia among pregnant and breastfeeding women. This descriptive cross-sectional study interviewed 1,185 pregnant and breastfeeding mothers, evaluating anemia based on their most recent hemoglobin levels. The study uncovered a high prevalence of anemia among pregnant women (72.92%), with 33.91% experiencing moderate anemia and 0.83% severe anemia. Among breastfeeding mothers, 26% were affected by anemia, with 63.93% exhibiting moderate anemia and 1.29% severe anemia. Access to nutrition and health services was limited, and various sociodemographic factors were associated with anemia in these populations. The findings underscored the heightened prevalence of anemia in expectant and nursing mothers, coupled with inadequate utilization of healthcare and nutrition services. To combat these challenges, the study advocates for comprehensive nutrition education and counseling interventions aimed at improving maternal and child health.[161]

A retrospective study conducted in a tertiary care hospital in Delhi, India, in 2016 delved into blood transfusion practices during deliveries. The study aimed to assess blood demand, utilization patterns among delivery cases, and propose potential enhancements to existing procedures. Spanning two years and following standard hospital protocols, the study monitored emergencies such as placental abruption or postpartum hemorrhage, which required urgent blood transfusions. Findings revealed that 121 cases (2.67% of all delivery cases) required blood transfusions. Among elective caesarean sections, the transfusion rate was 1.58%, whereas emergency caesarean sections showed a higher rate at 2.82%. For vaginal deliveries, 2.82% required transfusions due to unforeseen reasons. Despite all precautions, occasional bleeding incidents persist, necessitating prompt and aggressive treatment. The mode of delivery appeared to influence the necessity for blood transfusions.[162]

A study conducted in Tamil Nadu, India, from 36 weeks of gestation to 6 weeks postpartum aimed to explore factors contributing to postpartum anemia within a rural community. The study's objective was to identify the causes of postpartum anemia and assess the mean change in maternal hemoglobin levels during this period. Blood samples were collected at intervals aligned with interviews involving 93 pregnant women. Results revealed a significant increase in the prevalence of postpartum anemia, with 47.3% of women reporting anemia six weeks after childbirth. Factors such as anemia during the third trimester of pregnancy, perception of substantial blood loss during delivery, younger maternal age, and inadequate iron supplementation during the postpartum phase were significantly associated with postpartum anemia. This study underscores the critical importance of addressing anemia during both pregnancy and the postpartum period, especially in rural areas, due to its substantial impact on overall health outcomes for mothers and their children.[163]

A review focused on blood transfusion utilization during obstetric emergencies was conducted in Ahmedabad, Gujarat, India, in 2014. The study aimed to identify high-risk pregnancy cases, evaluate patients' clinical status upon admission, assess the impact of prenatal visits on the necessity for blood transfusions, analyze the effects of blood components on patient health, and investigate causes of maternal mortality. Employing a retrospective methodology, the study analyzed the incidence of blood transfusions required for prenatal and postnatal patients over a three-month period at a tertiary care facility among 2,200 patients. Among them, 440 necessitated blood transfusions, with 30% due to severe anemia (Hb < 7 gm/dl) and 70% due to obstetric hemorrhage. Primary complications among transfused patients included postpartum hemorrhage (PPH, 36%) and anemia (34%). Regrettably, four patients succumbed to complications: one due to severe anemia, another to severe PPH, and two to DIC and septicemia. The study emphasized the importance of ensuring an adequate and safe blood supply and advocating for judicious therapeutic blood use to improve maternal outcomes during obstetric emergencies.[104]

In 2018, a retrospective study was conducted in Belagavi, Karnataka, with the aim of identifying indications for blood transfusion (blood and blood products) in obstetrics and assessing potential transfusion reactions. The Department of Obstetrics and Gynecology at the KLE Dr. Prabhakar Kore Charitable Hospital and Medical Research Centre in Belagavi was the research site. The analysis involved all women who received blood or blood product transfusions related to pregnancy, evaluating the appropriateness of usage and any adverse reactions. The study included 204 women who underwent transfusions of blood and blood products. Indications for transfusions encompassed various conditions, including anemia related to pregnancy, obstetric hemorrhage, hemolysis, elevated liver enzymes and low platelets, thrombocytopenia, disseminated intravascular coagulopathy, ruptured ectopic and uterus, as well as other situations like complete abortion, incomplete abortion, hydatidiform mole, and persistent trophoblastic disease. Pregnancy-related anemia accounted for the most frequent cause, reported in 121 cases (58.45%), followed by obstetric hemorrhage in 40 cases (19.32%). The study observed a transfusion reaction incidence of 4.41%.[164]

A 2019 cross-sectional study in India focused on 102 pregnant women admitted to the labor room for vaginal or caesarean deliveries, specifically examining those experiencing postpartum hemorrhage (PPH) categorized into primary atonic PPH and traumatic PPH groups. The mean ages were 33.6 and 32.9 years, with '0' parity observed in 59.3% and 51.2% of cases, and mean BMIs of 22.8 and 23.9 kg/m², respectively. Among these groups, 34.6% and 17.1% of babies were delivered by LSCS, and 11.7% and 12.2% had a prior history of PPH. Treatment strategies varied:

atonic PPH cases were primarily managed using 'Uterotonics + <2 blood transfusions' (77.2%), 'Uterotonics + >2 blood transfusions' (15.4%), 'Perineal Tear Repair' (4.3%), and 'Surgical Intervention' (3.1%). In contrast, all traumatic PPH cases required 'surgical intervention' (100.0%). The study underscored the necessity of a multidisciplinary approach encompassing medical, mechanical, surgical, and radiological interventions for severe hemorrhage, emphasizing the critical role of blood availability. Timely identification of uterine atony and accurate assessment of blood loss were highlighted as pivotal elements for effective PPH management.[98]

A retrospective study conducted in Maharashtra, India, from 2015 to 2017, at the Obstetrics & Gynaecology department of Swami Ramananda Tirth Rural Medical College in Ambajogai, focused on postpartum hemorrhage (PPH) and involved 168 patients. The study aimed to assess maternal morbidity and mortality associated with PPH. Findings revealed a 29% incidence of PPH, with uterine atony identified as the primary cause (69%), followed by traumatic causes (20%). Peripartum hysterectomy rates were 12.06% for atonic cases and 5.88% for rupture uterus cases, while 82.14% of patients received blood transfusions. Maternal deaths due to hemorrhage stood at 5.3%. The study emphasizes the importance of skilled management, timely referrals, and anticipatory measures to reduce maternal morbidity and mortality associated with PPH. It highlights a decline in such deaths attributed to improved socioeconomic status, advanced medical and surgical interventions, utilization of the Non-pneumatic Anti-Shock Garment (NASG), and expert care provided at the institute.[165]

A retrospective study conducted in Tamil Nadu, India, in 2021 at a tertiary care hospital examined 225 mothers diagnosed with postpartum hemorrhage (PPH). The study aimed to estimate the prevalence and outcomes of PPH, with obstetric score, delivery mode, and etiology considered secondary outcomes. The recorded prevalence of PPH stood at 0.73%, primarily attributed to an atonic uterus (79.11%), traumatic causes (19.56%), and tissue retention (1.33%). Notable risk factors included induced labour (16%) and prolonged labour (11.1%). Treatment predominantly favored medical management (91.11%), with 8.88% opting for surgical intervention. Among multigravida patients, 65% underwent surgery. The survival rate was notably high at 98.22%, with shock (75%) and cardiac arrest (25%) identified as causes of the four recorded deaths. This study underscores uterine atony as the primary cause of PPH, highlights induced labour as a significant risk factor, emphasizes the prevalence of conservative management, and notes shock as the primary cause of death in PPH cases.[166]

A study conducted in the Himalayan region of India addressed the challenge of postpartum hemorrhage (PPH), a major cause of maternal mortality. The study aimed to implement a 'community-based advance distribution of Misoprostol program,' focusing on home deliveries in areas where oxytocin use was challenging.The initiative, conducted in the Janjheli block of Mandi district, Himachal Pradesh, targeted geographical barriers and high rates of home births from 2014 to 2015. Guided by WHO Health Systems Strengthening (HSS) principles, the program emphasized local ownership, tablet procurement, training, communication, community engagement, and monitoring mechanisms. Over a year, 89% of 512 home deliveries received the tablets, with 84% of them consuming the tablets within one minute after delivery, and reported no incidents of PPH. The program notably increased institutional delivery rates from 45% to 93% and improved pregnancy tracking. This successful model, utilizing 600 mcg misoprostol tablets and an HSS-driven framework, is being expanded to more blocks in Himachal Pradesh and other

Indian states, demonstrating its potential scalability and effectiveness in preventing PPH and improving maternal health outcomes.[167]

This study aimed to investigate postpartum hemorrhage (PPH) among low-risk women in rural India, a crucial concern in maternal health within resource-limited settings. The research drew upon data from a trial involving 1620 women primarily assessing the efficacy of oral misoprostol in preventing PPH. Findings revealed a 9.2% incidence of PPH. Interestingly, few differences emerged in maternal or sociodemographic aspects between those affected by PPH and unaffected individuals, except for the use of misoprostol. Identified risk factors contributing to PPH included inadequate prenatal visits (less than four) and the absence of iron supplementation, significantly heightening vulnerability ($P<0.001$ and $P=0.037$, respectively). Additionally, factors such as perineal tears and birth weight, identified during the second stage of labour, displayed associations with PPH ($P=0.003$). In summary, this study highlighted a limited set of factors associated with increased PPH risk among low-risk women in rural India, underscoring the need for enhanced primary prevention strategies like iron supplementation and active management of the third stage of labour, alongside improved access to obstetric care and emergency services.[168]

Addressing Postpartum Hemorrhage (PPH), a leading cause of global maternal mortality (75-90% attributed to uterine atony), this review emphasizes the critical need for immediate and effective management to prevent Major Obstetric Hemorrhage (MOH). Drawing insights from a study conducted in India and other sources, the comprehensive review highlights evidence-based PPH management strategies, debates on blood transfusion, and recent advancements. Despite meticulous prenatal care, PPH occurrences can manifest unexpectedly. The review urges timely identification of high-risk women during prenatal care and emphasizes the importance of swift assessment of blood loss and multidisciplinary intervention. Management strategies aim at hemodynamic stabilization and hemorrhage control, with refractory cases often necessitating postpartum hysterectomy. Emphasizing pragmatic strategies, especially in developing nations, the review underscores the urgency for superior practices in combating PPH and improving maternal outcomes.[169]

In a cross-sectional observational study conducted at Kasturba Hospital of MGIMS, Sewagram, a rural tertiary care institute in central India, researchers aimed to investigate the prevalence and determinants of maternal anemia among pregnant women receiving antenatal care. The study involved 500 pregnant women in their first trimester, among whom 49.8% were found to have anemia 30.8% with mild anemia, 17.2% with moderate anemia, and 1.8% with severe anemia. Factors such as younger age, rural residency, lower socioeconomic status, living in joint families, and limited education were identified as correlating with higher anemia prevalence. The research underscores the significance of addressing anemia in pregnancy. It emphasizes the necessity for interventions promoting appropriate marriage age, smaller family norms, educating girls, implementing preventive strategies targeting adolescent mothers for anemia, and enhancing women's financial empowerment to improve maternal and fetal health outcomes.[170]

The National Rural Health Mission (NRHM), launched in 2005, aimed to bolster maternal healthcare, postnatal services, and the well-being of newborns and children under five, particularly in marginalized communities. An assessment of its impact in high-priority Indian states, utilizing data from the District Level Household and Facility Surveys (DLHS), revealed a significant reduction in socioeconomic disparities regarding institutional deliveries post-NRHM implementation. There was a notable increase in institutional delivery rates across all socioeconomic strata, particularly benefiting lower and middle wealth and education tertiles. While early stages of NRHM displayed limited improvements in antenatal care (ANC), subsequent phases showed substantial enhancements and equitable progress. This study underscores NRHM's pivotal role in ameliorating maternal, postnatal, and child health among marginalized populations, highlighting the necessity for targeted interventions and integrated healthcare strategies to ensure equitable access to vital healthcare services.[171]

2.5. Justification

The continuum of pregnancy and childbirth represents a profound chapter in maternal health, characterized by the Center for Disease Control's recognition of a staggering 2.5 million vaginal deliveries globally, with 68% occurring in the U.S. and accounting for 80% of total births worldwide.[172] However, this pivotal phase isn't devoid of challenges; perineal infections post-vaginal delivery, while largely preventable, persist as significant concerns, urging meticulous adherence to clean delivery practices and attentive episiotomy wound care, primarily under the vigilant supervision of skilled nursing.[173]

Intriguingly, among women subjected to episiotomy during vaginal delivery, a notable 35.6% encountered subsequent infections, unveiling a spectrum of pathogens, including Escherichia coli, Enterobacter spp., Streptococcus spp., among others, with varying degrees of resistance to antibiotics.[174] Nurses stand as the linchpin in this landscape, their pivotal role spanning the phases of pregnancy, labor, and postpartum care, where they uphold the critical facets of perineal hygiene and effective pain management, emblematic of their reliance on evidence-backed practices within their profession.[175]

Delving deeper, our study probes into multifaceted determinants encompassing maternal health conditions, socio-economic factors, residential attributes, occupational dynamics, education, ethnicity, religion, antenatal care visits, and the prevailing disparities in healthcare delivery systems. This exploration aims to unearth the intricate correlations between these determinants and the immediate adverse outcomes often encountered during pregnancy and childbirth, shedding light on pivotal factors that might significantly influence the complications arising during this delicate phase.[176,177]

Amidst this context, arises the 'perineal care bundle intervention.' Designed as a specialized approach, this intervention doesn't aim solely to maintain but to elevate the current standards of care. It envisions a proactive stance against perineal infections, offering a promising prospect in preventing these distressing complications.[173,174]

Our research endeavors to fill the voids in contemporary understanding. By evaluating the effectiveness of the perineal care bundle intervention and meticulously examining the determinants of immediate adverse pregnancy outcomes, we aspire to contribute pivotal insights that could herald transformative practices, fortify the quality of patient care, and ultimately, optimize the well-being of both mothers and newborns.

CHAPTER – 3

MATERIALS AND METHODS

Research materials and methods are the techniques used to structure a study and to gather and analyse information relevant to the research question.[178]

The present chapter unfolds the methodology applied to acquire the desired and required information pertaining to the research problems, to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes. Reducing episiotomy wound pain, inflammation, and infection among mothers admitted in labour and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

The study contains following headings:

1. Research approach
2. Research design
3. Research setting
4. Study population
5. Sample size
6. Sampling technique
7. Description of tool
8. Principle of perineal care
9. Perineal care bundle Protocol
10. Data Collection Instruments and Techniques
11. Pilot study
12. Procedure for data collection
13. Data analysis data

The present chapter unfolds the methodology applied to acquire accurate, desired and required information pertaining to:

3.1. Research Approach

A quantitative, analytical, evaluative research approach was used in this study to evaluate the effectiveness of perineal care bundle intervention and immediate adverse pregnancy outcomes among mothers admitted to labour and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

3.2. Research Design

Randomized control trial was chosen.[179]

GROUP	RANDOMIZATION	PRE TREATMENT ASSESSMENT	INTERVENTION	POST TREATMENT
C_1	R	Q1	X_1	Q2
C_2	R	Q1	X_2	Q2

Keys:

C_1 is the intervention group

C_2 is the non-intervention group

R is the randomization of the sample

Q_1 is the pre-intervention assessment

Q_2 is the post-intervention assessment

X_1 is the perineal care bundle intervention.

X_2 is the instruction for self-perineal care

3.3. Variables Under Study

In experimental studies, concepts are usually referred to as variables which are the central building blocks of the study.[178]

The present study aimed to evaluate the effectiveness of the perineal care bundle intervention and immediate adverse pregnancy outcomes.

3.4. Independent variables

The independent variable is the variable that is believed to influence or cause the dependent variable. In an experimental study, the independent variable is the treatment or intervention the researcher manipulates.[180] In this study independent variable was perineal care bundle intervention. Other independent variables were age, occupation, residence, monthly family income, anemia, dietary pattern, type of marriage, ANC visit, Hb level during pregnancy, and parity.

3.5. Dependent Variable

It is the outcome of a criterion variable that is hypothesized to be caused by another variable.[180]

In the present study the dependent variables were pain, inflammation of episiotomy wound, outcome of high vaginal swab culture (organism growth and non growth), low birth weight, preterm birth, birth asphyxia, post partum haemorrhage and blood transfusion of mothers admitted to labour and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

3.6. Extraneous Variable

In the present study the extraneous variables are nutritional status and Body Mass Index (BMI) of mothers admitted to labour and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

3.7. Research Setting

Settings are most specific places where data collection based on nature of research questions and type of information needed to address it.[180]

The settings selected for the present study was KLES Dr. Prabhakar Kore Charitable Hospital and Research Centre, Belagavi, Karnataka. The criterion for selecting was the feasibility for conducting the study.

3.8. Study Population

The population is defined as the entire set of individuals (or objects) having some common characteristics, sometime referred to universe.[181,182] In the present study, the study population comprises of mothers' normal vaginal delivery with episiotomy and non-episiotomy at postnatal ward in selected tertiary care hospital Belagavi, Karnataka India.

3.9. Sample

A sample is a portion of the population that has been selected to represent the population of interest.[179] Thus, it is a subset of the population element.[78] The sample for the present study was laboring and postnatal mothers with normal vaginal delivery admitted to the labor and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

3.10. Sample Size

Sample size formula for testing the difference between two population proportions for a quantitative, randomized controlled trial was used.

$$n = \frac{\left(z_{1-\frac{\propto}{2}} + z_{1-\beta}\right)^2 (p_1 q_1 + p_2 q_2)}{(p_1 - p_2)^2}$$

Where,

95% confidence level, $z_{1-\frac{\propto}{2}} = 1.96$

80% power, $z_{1-\beta} = 0.84$

$p_1 = 1.2$ and $p_2 = 7.2$ were taken from a study conducted by Gwelo et al. in Tanzania in 2019.[127]
n =167 mothers (each group)

A total required sample size = 334 mothers, 167 in the intervention group, and 167 in the non-intervention group were enrolled in this study.

3.10.1. Sampling Technique

The sampling technique used for the study was inverse sampling technique.

3.10.2. Sampling Criteria

Inclusion Criteria:

- Mothers admitted to the labour and postnatal ward of KLES Dr. Prabhakar Kore Hospital and Medical Research Centre.
- Spontaneous vaginal delivery.
- Mothers age 20 and above.
- Mothers with episiotomy and non-episiotomy

Exclusion Criteria:

- Premature Rupture of Membrane (PROM)
- Mothers who suffered from infection
- Mothers who has history of chronic diseases (Heart problem, renal problem, diabetes mellitus, thyroid).
- Pregnancy-induced complications; pregnancy-induced hypertension, gestational diabetes mellitus,
- Mothers with caesarean section delivery.

3.10.3. Approval from the Institutional Ethical Committee

Ethical clearance was obtained from KLE Academy of Higher Education and Research (KAHER), Belagavi.

3.10.4. Administrative and Ethical Considerations:

Hospital Authority: Formal permission was obtained from the Director of Dr.Prabhakar Kore Hospital, Medical Superintendent, KLE’s Dr. Prabhakar Kore Charitable Hospital, Belagavi and Head of Department of Obstetrics and Gynecology, KLE’s Dr. Prabhakar Kore Hospital, Belagavi.

Patient’s Consent

Written informed consent was obtained from the mothers admitted in Dr.Prabhakar Kore Hospital and Medical Research Centre Hospital, Belagavi, after explaining the procedure and their role in the study.

3.10.5. Data Collection Instruments

3.10.6. Description of the Tool

The following tools were used

Tool 1: Demographic, Pregnancy Related Information, and Maternal and Neonatal Immediate Adverse Pregnancy Outcomes.

Socio-demographic conditions, personal information, and pregnancy-related data were collected using structured interview schedules. Additionally, immediate adverse pregnancy-related data were extracted from patients' case sheets.

The demographic profile in the current study encompassed ten variables, including age, religion, type of marriage, educational status, occupation, family monthly income, residence, dietary pattern, smoking, and alcohol habits. Pregnancy-related information was composed of four variables: parity, antenatal care (ANC) visits, hemoglobin (Hb) levels, and episiotomy.

Immediate adverse neonatal outcomes were assessed based on three variables: low birth weight, preterm birth, and birth asphyxia. Maternal immediate adverse pregnancy outcomes were characterized by two variables: blood transfusion and postpartum hemorrhage.

Tool 2: Perineal care bundle sheet

Perineal care bundle sheet is a standard tool used for recording the perineal care bundle intervention.

Perineal care bundle intervention obtained before delivery 2 hourly and after delivery to till discharge 4 hourly.

Perineal care bundle sheet includes name and IP number of patient, date and time of every perineal care bundle intervention and signature of the care provider.

Tool 3: Episiotomy Wound Healing Assessment

For episiotomy wound healing assessment, standardized tool REEDA scale was used.

Total score: 0-15

Mild: 0-5

Moderate: 6-10

Severe: 11-15

REEDA scale score calculated by independent ‘t’ test

Tool 4: Episiotomy Pain Intensity Assessment

Total score: 10

No pain: 0

Mild pain: 1-3

Moderate pain: 4- 7

Worst pain: 8- 10

Tool 5. Perineal Care Checklist: It was used to record the information regarding outcomes of perineal care bundle interventions (fungal, gram-negative and gram-positive bacterial infection) was obtained from high vaginal swab culture reports from the laboratory. The high vaginal swab culture included Gram-positive, Gram-negative, and fungal infections, encompassing nine variables: common vaginal cells, Enterococci, Pyognes, S. aureus, Klebsiella, E. coli, Proteus, Candida albicans, and non-Candida albicans.

3.10.7. Principle of perineal care

- To clean the perineum from the cleanest to the less clean
- Follow standard precautions
- Maintain patient's privacy
- Labor/postpartum patients

3.10.8. Perineal care bundle Protocol

The protocol was crafted based on an extensive review of the literature.

Pre Test

- Collect the articles
- Explain the procedure and obtain written informed consent.
- Maintain the patient's proper (lithotomy) position and privacy.
- Collect high vaginal culture swab sample for the pre-test (during 1st stage of labour) when the patient was admitted to the labour room.
- Standard of perineal care along with perineal care bundle intervention provide every 2nd hourly in an intact membrane before delivery for intervention group.
- Standard of perineal care along with perineal care instructions given to the mothers before delivery for non-intervention group.
- Record the procedure in perineal care bundle sheet after procedure.

Post Test

- Collect the articles
- Standard of perineal care along with perineal care bundle intervention provide every 4th hourly after delivery to until discharge for intervention group.
- Standard of perineal care along with perineal care bundle instructions given to the mothers for non-intervention group.
- Collect the high vaginal swab culture after 72 hours of delivery.
- Record the procedure in perineal care bundle sheet after procedure.

3.10.9. Data Collection Instruments and Techniques

Description of the tool: Proforma for data collection contained the following sections.

Section A: Socio-demographic Information

The variables included in the sociodemographic information were age, religion, monthly family income, and educational status of the mothers, occupation of the mothers and residence, type of marriage, dietary pattern, smoking status and consumption of alcohol.

Section B: Pregnancy Related Information

This section included parity, antenatal visits during the pregnancy according to Antenatal Care record, haemoglobin during labour.

Section C: High Vaginal Swab Culture Before Delivery (During admission)

This section included vaginal swab culture information data collected by using the check list.

Section D : Pain and wound healing assessment (6 to 10, 20 to 24 and 40 to 48 hours of delivery)

This section included the pain assessment by using the VAS scale and assessment of wound healing by using REEDA scale.

Section E: Neonatal Immediate Adverse Outcomes (According to patient's case sheet).

This section included the information about the neonatal immediate adverse birth outcomes like low birth weight, preterm birth, and birth asphyxia. This section was collected in accordance to patient's case sheet before discharge.

Section H: Maternal Immediate Adverse Pregnancy Outcomes Information

This section included the information on post-partum haemorrhage and blood transfusion, according to patient's case sheet.

Section I: Perineal Care Outcomes (high vaginal swab culture) after 72 hours of delivery (Before Discharge).

This section was taken according to the patient's case sheet and perineal care bundle sheet. This section included the information on perineal care and high vaginal culture swab outcomes before patient discharge by using the check list.

3.10.10. Content validity and reliability of the tool

The content validity was obtained by face validity where eight professional experts were asked for their opinion. Data validation tool in excel was used for proper entry of data.

3.10.11. Pilot Study

To ensure internal validity, we conducted a pilot study in the labor and postnatal ward. Formal permission was obtained from the ethical committee and the Obstetrics and Gynecology Department of Dr. Prabhakar Kore Hospital and Medical Research. The study involved 16 participants in the intervention group and 16 participants in the non-intervention group, all within the labor and postnatal ward. In the non-intervention group, a total of three fungal infections were observed, with two being Candida albicans infections and one being a non-Candida albicans infection. After 6 to 10 hours, 20 to 24 hours, and 40 to 48 hours post-episiotomy, the non-intervention group exhibited higher mean REEDA scores and VAS scores compared to the intervention group. The reliability of both REEDA scores and VAS scores were assessed as good, with a Cronbach's alpha value of 0.873. Some modifications were made in the tools based on the observations.

3.10.12. Data Management and analysis

Data was analysed using excel and SPSS 20.0 version for the following:

- Frequency distribution and variation in the data were observed by calculating percentage, mean, median, standard deviation and percentiles.
- Sociodemographic, features, maternal immediate adverse pregnancy outcomes, high vaginal swab culture outcomes, and neonatal immediate outcomes was used chi-square.
- Independent ‘t’ test was used to detect the mean REEDA score and mean VAS in different time duration of post episiotomy.

- Regression was used to detect the determinants of immediate adverse pregnancy outcomes.
- Test values, degree of freedom, regression, chi-square and the corresponding p values were specified for each of the variable.
- The reliability of both REEDA scores and VAS scores were assessed as good, with a Cronbach's alpha value of 0.873.
- P value <0.05 was considered significant.

3.10.13. Data Collection Procedure

Phase 1

Permission was obtained from the following authorities:

- Medical Superintendent, KLE’s Dr.Prabhakar Kore Hospital, MRC, Belagavi.
- Head of Department of Obstetrics and Gynecology, JNMC, Belagavi.
- The participants were recruited after the inclusion and exclusion criteria were met.
- The participants were selected by inverse sampling technique and for group division we used randomization (envelope) method.
- The study was explained to the participants before obtaining written informed consent.
- Demographic and pregnancy related information obtained in both groups.

- Maintained the standard protocol during intervention.
- Collected the articles (Tray with perineal care bundle set, gloves, soap, clean water, kidney tray, forceps, high vaginal swab kits)
- Pretest Q_1 was collected (high vaginal swab culture) on both the intervention and non-intervention groups during the admission in labour room and the culture reports were obtained.

Phase 2: Perineal care bundle intervention X_1 was performed by using the perineal care bundle set (normal saline 20 ml with 5% betadine, gauze pieces and sterile sanitary pads) every 2nd hourly during labour in intervention group and recorded in perineal care sheet to the mothers admitted to labour room in selected tertiary care hospital.

- Perineal care bundle verbal instructions X_2 was obtained for non-intervention group every 2 hourly during labour in non-intervention group and recorded in perineal care bundle sheet to the mothers, who admitted in the labour room and postnatal.

Phase 3: Perineal care bundle intervention X_1 was performed every 4th hourly after delivery to until discharge.

- Perineal care bundle intervention along with wound healing assessment by using the REEDA scale and pain intensity assessment by using VAS scale during 6 to 10 hours of episiotomy in both groups and recorded.

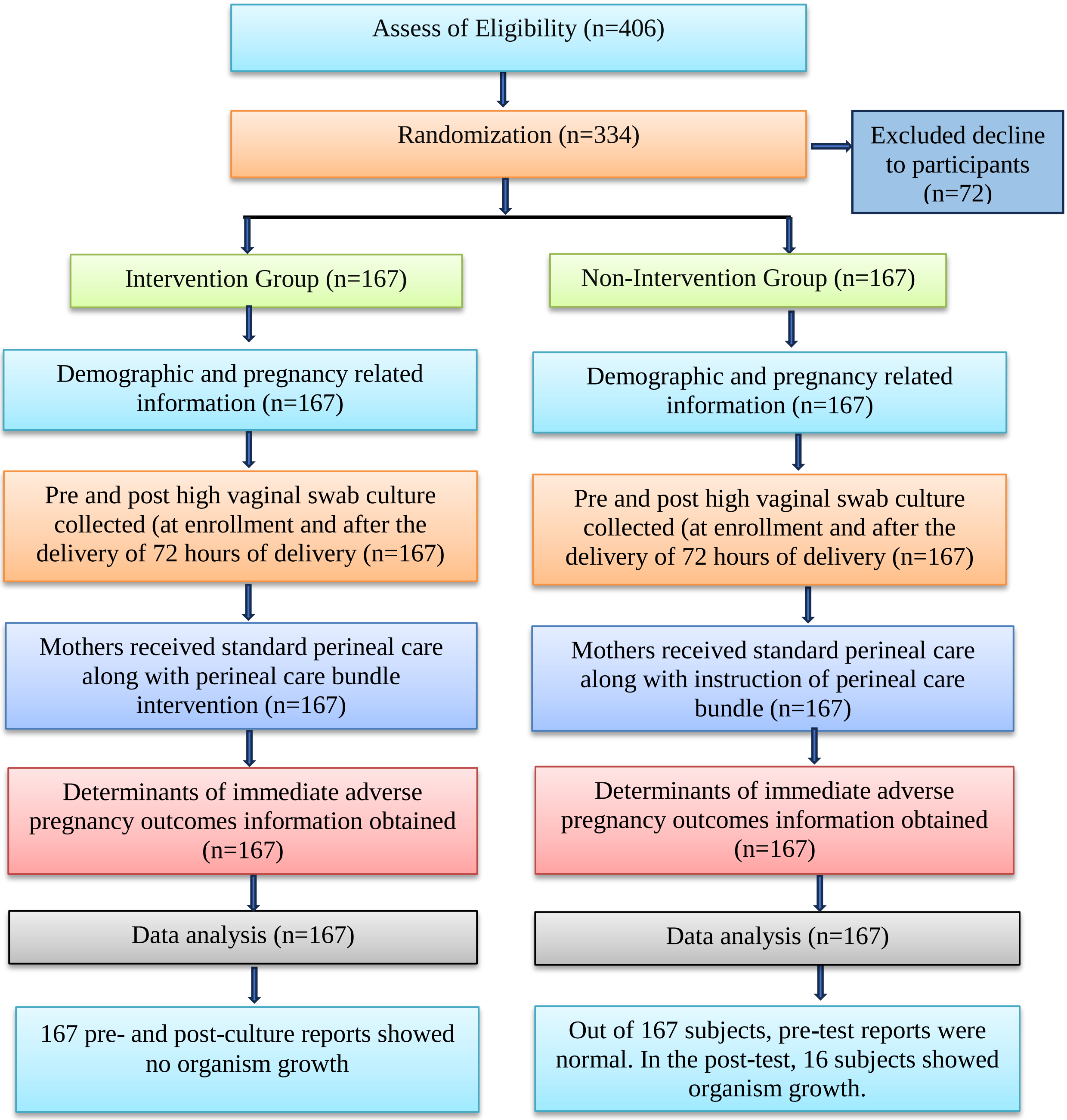
Phase 4: Perineal care bundle intervention along with wound healing assessment by using the REEDA scale and pain intensity assessment by using VAS scale during 20 to 24 hours of episiotomy in both groups and recorded.

- **Phase 5:** Perineal care bundle intervention along with wound healing assessment by using the REEDA scale and pain intensity assessment by using VAS scale during 40 to 48 hours of episiotomy in both groups and recorded.

Post- test

- Maintained the standard protocol during intervention.
- Collected the articles (Tray with perineal care bundle set, gloves, soap, clean water, kidney tray, forceps, high vaginal swab kits)
- Q2 was collected (High vaginal swab culture) after 72 hours of delivery and the culture reports were obtained in both groups and recorded.
- The outcomes of perineal care bundle interventions were recorded.
- Immediate adverse pregnancy outcomes information was obtained through patient's case sheet

Figure 3.10.14.Flow diagram data collection procedure



Conclusion

This chapter describes the research approach and design. It elaborates the study variables, study setting and population, sample size and sampling technique. It explains how the data was managed.

CHAPTER - 4

ANALYSIS AND INTERPRETATION

In this chapter, data were collected from 334 mothers admitted to the labour and postnatal ward of KLES Dr. Prabhakar Kore Hospital and Medical Research Centre. A total of 167 were categorized into the intervention group, and 167 were categorized into the non-intervention group. The data were entered into an Excel sheet, and analysis was conducted using Statistical Package for Social Science (SPSS 20.0).

Objectives

Primary Objective

To assess the effectiveness of the perineal care bundle (with antiseptic solution and use of sterile pads intervention) to prevent infection among mothers admitted to a tertiary care hospital in Belgaum, Karnataka, India.

Secondary Objective

To identify the determinants of immediate adverse pregnancy outcomes among the mothers admitted to the same hospital.

Organization of the study findings

The data were grouped into the intervention and non-intervention groups and analyzed and presented under the following headings:

Section I: General Characteristics of the Participants

Socio-demographic information among the mothers admitted to the labour and postnatal ward in the selected tertiary care hospital in Belgaum, Karnataka, India.

Section II: This section presents pregnancy-related information among mothers admitted to the labour and postnatal ward in the tertiary care hospital.

Section III: This section presents results aligning with the primary objective of the study, which focused on evaluating the effectiveness of the perineal care bundle (involving antiseptic solution and the use of sterile pads) intervention. This assessment was conducted through pre-delivery and post-delivery (within 72 hours) high vaginal swab culture analysis, along with the utilization of REEDA and VAS scores among mothers admitted to the labour and postnatal ward in a tertiary care hospital in Belgaum, Karnataka, India.

Section IV: Results in accordance with the first objective, focusing on the association between demographic characteristics and outcomes of perineal care intervention (infection) among the mothers admitted to the labour and postnatal ward in the selected tertiary care hospital.

Section V: Results related to the secondary objective, immediate adverse pregnancy outcomes among the mothers admitted to the labour room and postnatal ward in the tertiary care hospital.

4.1: Section I: General Characteristics of the Participants

This section presents the distribution of sociodemographic information among mothers admitted to the labour and postnatal ward in selected hospitals. This information is presented in Tables 4.1.1, 4.1.2, and 4.1.3, highlighting the differences between the intervention and non-intervention groups

This section presents the distribution of sociodemographic information among mothers admitted to the labour and postnatal ward in selected hospitals. This information is presented in Tables 4.1.1, 4.1.2, and 4.1.3, highlighting the differences between the intervention and non-intervention groups

Table 4.1.1: Subject Distribution by Demographic Characteristics n=334

Sociodemographic Information		**Intervention Group**		**Non-intervention Group**		**Total**		**Chi Square (df)**	**p-Value**
		n1	**%**	**n2**	**%**	**N**	**%**		
Age of Mothers	20 – 25	123	73.7	102	61.1	225	67.4	7.14 (3)	0.67
	26 – 30	16	9.6	30	18	46	13.8		
	31 – 35	23	13.8	30	18	53	15.9		
	36 ≥	5	3	5	3	10	3		
Religion	Hindu	136	81.4	125	74.9	261	78.1	2.37 (2)	0.306
	Muslim	22	13.2	32	19.2	54	16.2		
	Others	9	5.4	10	6	19	5.7		
Education	Illiterate and primary	5	3	6	3.6	11	3.3	5.94 (4)	0.204
	Secondary	21	12.6	18	10.8	39	11.7		
	PUC	67	40.1	51	30.5	118	35.3		
	Bachelor	48	28.7	51	30.5	99	29.6		
	Postgraduate	26	15.6	41	24.6	67	20.1		

Table 4.1.1 presents an overview of the socio-demographic information concerning the mothers involved in the study. The majority of participant mothers, totaling 67.4%, fell within the 20 to 25 years age group, with 73.7% in the intervention group and 61.1% in the non-intervention group. Additionally, 78.1% identified as Hindus. Moreover, a significant number of participant mothers had completed education up to the Pre-University Course level, accounting for 35.3% in both the intervention (40.1%) and non-intervention groups (30.5%). Table 4.1.1.

Table 4.1.2 : Subject Distribution by Demographic Characteristics n=334

Sociodemographic Information		Intervention Group		Non-intervention Group		Total		Chi Square (df)	p-Value
		n1	%	n2	%	N	%		
Occupation	Housewives	38	22.8	41	24.6	79	23.7	3.5 (4)	0.478
	Agriculture	44	26.3	32	19.2	76	22.8		
	Private Service	33	19.8	39	23.4	72	21.6		
	Government Services	9	5.4	6	3.6	15	4.5		
	Others	43	25.7	49	29.3	92	27.5		
Type of Marriage	Consanguineous	22	13.2	29	17.4	51	15.3	1.13 (1)	0.287
	Non consanguineous	145	86.8	138	82.6	283	84.7		
Residence	Urban	43	25.7	49	29.3	92	27.5	1.05 (2)	0.592
	Semi Urban	48	28.7	51	30.5	99	29.6		
	Rural	76	45.5	67	40.1	143	42.8		
Dietary pattern	Pure Vegetarian	38	22.8	37	22.2	75	22.5	0.90 (2)	0.638
	Mixes Diet	73	43.7	66	39.5	139	41.6		
	Vegetarian Consume Egg	56	33.5	64	38.3	120	35.9		

In the intervention group, the majority of mothers were involved in agricultural occupations (26.3%), whereas in the non-intervention group, this percentage was 19.2%. Non-consanguineous marriages were common among the participant mothers, and a notable portion lived in rural areas within the study's scope. Additionally, the prevalent dietary pattern among these mothers primarily consisted of mixed diets, as indicated in Table 4.1.2.

Table 4.1.3: Subject distribution by demographic characteristics n=334

Sociodemographic information		**Intervention Group**		**Non-intervention Group**		**Total**		**Chi Square (df)**	**p-Value**
		n1	**%**	**n2**	**%**	**N**	**%**		
Smoking Habit	Yes	21	12.6	11	6.6	32	9.6	3.46 (1)	0.063
	No	146	87.4	156	93.4	302	90.4		
Alcoholic Habit	Yes	11	6.6	6	3.6	17	5.1	1.55 (1)	0.213
	No	156	93.4	161	96.4	317	94.9		
Monthly family Income in Rupees	< 5000	20	12	21	12.6	41	12.3	3.04 (3)	0.385
	5000 – 9999	11	6.6	10	6	21	6.3		
	10000 – 19999	47	28.1	34	20.4	81	24.3		
	20000+	89	53.3	102	61.1	191	57.2		

A minority of participant mothers exhibited a smoking habit, with an incidence of 12.6% in the intervention group and 6.6% in the non-intervention group. Similarly, among the participant mothers, 6.6% in the intervention group had a habit of alcohol consumption, whereas this figure was 3.6% within the non-intervention group. Concerning maternal monthly family income exceeding 20,000 rupees, it constituted 53.3% in the intervention and 61.1% in the non-intervention group. However, the association between income levels and the distribution of intervention and non-intervention did not exhibit statistical significance, as illustrated in Table 4.1.3.

4.2. Section II: Table 4.2.1 and Figure 4.2.1 present pregnancy-related information concerning mothers admitted to the labour and postnatal ward within a tertiary care hospital.

Table 4.2.1: Distribution of Pregnancy Related Information Among Mothers Admitted to Labor and Postnatal Ward in Intervention and Non-Intervention Groups n=334

<table>
<tr><th colspan="9">Pregnancy Related Information of Mothers</th></tr>
<tr><th colspan="2" rowspan="2">Pregnancy Related Information</th><th colspan="2">Intervention Group</th><th colspan="2">Non-Intervention Group</th><th rowspan="2">N</th><th rowspan="2">Chi-Square (df)</th><th rowspan="2">p-Value</th></tr>
<tr><th>n1</th><th>%</th><th>n2</th><th>%</th></tr>
<tr><td rowspan="2">Parity</td><td>Primi</td><td>83</td><td>49.7</td><td>87</td><td>52.1</td><td>170</td><td rowspan="2">0.19 (1)</td><td rowspan="2">0.0662</td></tr>
<tr><td>Multi</td><td>84</td><td>50.3</td><td>80</td><td>47.9</td><td>164</td></tr>
<tr><td rowspan="2">ANC Visits</td><td>4 ≥ANC visits</td><td>151</td><td>90.4</td><td>157</td><td>94</td><td>308</td><td rowspan="2">1.50 (1)</td><td rowspan="2">0.22</td></tr>
<tr><td>< 4 ANC Visits</td><td>16</td><td>9.6</td><td>10</td><td>6</td><td>26</td></tr>
<tr><td rowspan="4">Hb Level of Mothers</td><td>Normal Hb level</td><td>125</td><td>74.9</td><td>117</td><td>70.1</td><td>242</td><td rowspan="4">1.89 (3)</td><td rowspan="4">0.54</td></tr>
<tr><td>Moderate Anemic</td><td>9</td><td>5.4</td><td>11</td><td>6.6</td><td>20</td></tr>
<tr><td>Mild Anemic</td><td>27</td><td>16.2</td><td>35</td><td>21</td><td>62</td></tr>
<tr><td>Severe Anemic</td><td>6</td><td>3.6</td><td>4</td><td>2.4</td><td>10</td></tr>
</table>

Foot note: Significant: p >0.05, ANC: Antenatal Care Visit, Hb: Haemoglobin

The majority of participant mothers were observed to have primiparous status (n=170). In contrast, within the non-intervention group, the majority were primiparous (52.1%), while most cases exhibited multiparous status (47.9%). Most participant mothers had recorded counts of fewer than 4 antenatal care visits, with n=26 mothers falling into this category. Notably, among the cases, participant mothers with fewer than 4 antenatal visits accounted for 9.6% of the total, compared to 6% in the non-intervention group. Table 4.2.1

Most participants displayed normal hemoglobin levels (n=242). However, a higher percentage of mildly anemic mothers was observed in the non-intervention group (21%) compared to the intervention group's figure of 16.2%, as demonstrated in Table 4.2.1.

Figure. 4.2.1 Distribution of Mothers With Episiotomy Percentage in Groups

n=334

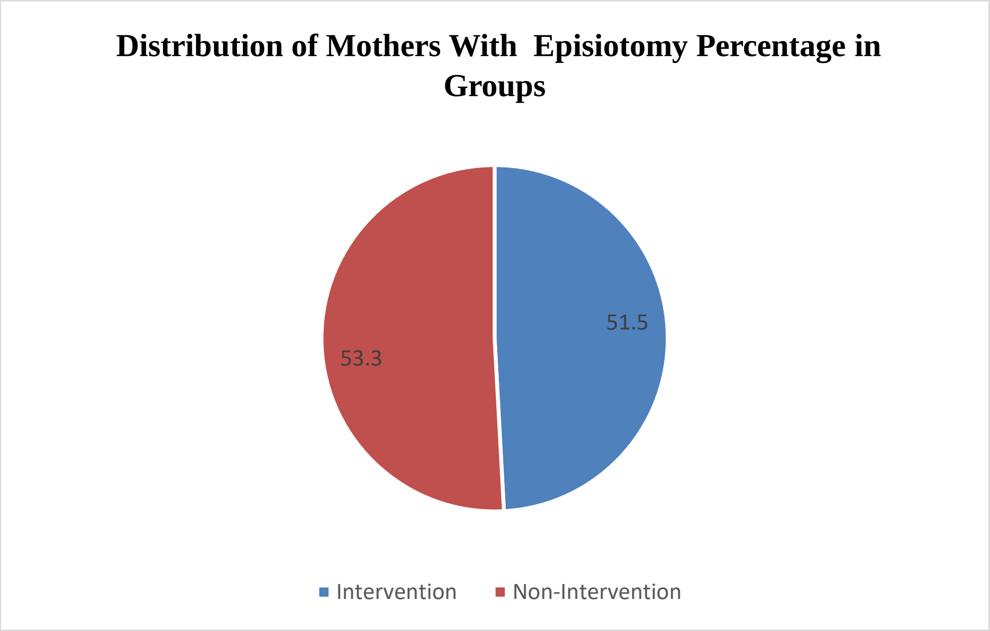


Figure 4.2.1. illustrates that in the case group, 51.5% of instances involved episiotomy, while the remaining 48.5% did not require episiotomy. Similarly, within the non-intervention group, 53.3% of cases involved episiotomy, while the remaining 46.7% did not necessitate this procedure.

4.3. Section III: This section presents the results aligned with the primary objective of the study, aimed at evaluating the effectiveness of the perineal care bundle intervention (involving antiseptic solution and the use of sterile pads) among mothers admitted to the labor and postnatal ward in a tertiary care hospital in Belgaum, Karnataka, India.

Table 4.3.1: Outcomes of High Vaginal Swab Culture Among Mothers in Labor and Postnatal Ward (Intervention vs. Non-Intervention) n=334

High Vaginal Swab Culture		**Intervention Group**		**Non-Intervention Group**		**Total**	
		n1	**%**	**n2**	**%**	**N**	**%**
Pre-Delivery (during admission)							
Growth/Non Growth	No	167	100	167	100	334	100
GNB Klebsiella	No	167	100	167	100	334	100
GNB E.coli	No	167	100	167	100	334	100
GNB Proteus	No	167	100	167	100	334	100
GPC Enterococci	No	167	100	167	100	334	100
S.Pyogenes	No	167	100	167	100	334	100
S. Aureum	No	167	100	167	100	334	100
Fungal C. Albicans Candida	No	167	100	167	100	334	100
Fungal Non Albicam Candida	No	167	100	167	100	334	100
Vaginal Common Cell Isolated	No	167	100	167	100	334	100
Post-Delivery (72hrs of delivery)							
Growth $\chi^2_{df=1}$=16.81, p< 0.001	Yes	0	0	16	9.6	16	4.8
	No	167	100	148	88.6	315	94.3
GNB Klebsiella	No	167	100	167	100	334	100
GNB E.coli	No	167	100	167	100	334	100
GNB proteus	No	167	100	167	100	334	100
GPC enterococci	No	167	100	167	100	334	100
S. Pyogenes	No	167	100	167	100	334	100
S. Aureum	No	167	100	167	100	334	100
Fungal Albican Candida $\chi^2_{df=1}$=16.81, p< 0.001	Yes	0	0	16	9.6	16	4.8
	No	167	100	151	90.4	318	95.2
Fungal non-Albican	No	167	100	167	100	334	100
Vaginal Common Cell Isolated	Yes	167	100	167	100	334	100
	No	167	100	167	100	334	100

High vaginal swab cultures were obtained from participant mothers before delivery, indicating no growth of any organisms. However, a subsequent swab culture conducted 72 hours after delivery identified fungal (Candida albicans) growth in 9.6% of participant mothers in the non-intervention group. This discovery established a statistically significant association, with a $\chi 2$ value of (df=1) = 16.81 and a p-value of less than 0.001, as detailed in Table 4.3.1.

Table 4.3.2 : Mean perineal pain measurement Visual Analog Scale (VAS) at 6 to 10, 20 to 24 and 40 to 48 hours postpartum among the intervention and non-intervention group n=174

Pain Intensity							
Pain Intensity	**Intervention Group**		**Non-intervention Group**		**Total**	**t. Value**	**P - Value**
	n1	**Mean ± SD**	**n2**	**Mean ± SD**	**N**		
6 to 10 Hours		7.90 ± 0.72	89	7.101±0.56	174	0.85	0.091
20 to 24 Hours	85	2.80± 1.03	89	3.94± 1.99	174	5.12	<0.001
40 to 48 Hours	85	0.42± 1.01	89	0.95 ± 1.40	174	2.88	<0.001

Note: p-value <0.05 has been estimated independent t- test, VAS : Visual Analogue Scale

The visual analogue scale was used to measure the episiotomy wound pain intensity. The peak mean pain intensity was observed during the 6 to 10-hour time frame (7.90 ± 0.72) in intervention group while mean pain intensity (7.101±0.56) in the non-intervention group with t value of 0.85. Nevertheless, the distinction between the intervention and non-intervention groups did not display statistical significance. It is noteworthy that the mean pain intensity was significantly higher within the non-intervention group compared to the intervention group in the 20 to 24-hour duration category p value <0.001 and the 40 to 48-hour duration category p value <0.001, as illustrated in Table 4.3.2.

Table 4.3.3. Mean wound healing in different time duration n=174

Wound Healing in Different Time Duration							
Wound Healing Process	**Intervention Group**		**Non-intervention Group**		**Total**		**P -Value**
	n1	Mean ± SD	n2	Mean ± SD	N	t value	
6 to 10 Hours	85	22.93 ± 2.11	89	25.26 ± 2.34	174	6.88	0.006
20 to 24 Hours	85	11.75 ± 2.91	89	14.06 ± 3.56	174	4.66	0.067
40 to 48 Hours	85	0.08 ± 0.28	89	0.31 ± 0.47	174	3.97	<0.001

Note: p-value <0.05 has been estimated independent t- test

The table 4.3.3: displays a study comparing wound healing in two groups, intervention and Non-intervention, at different time intervals (6-10 hours, 20-24 hours, and 40-48 hours). The Intervention group episiotomy wound healing was better healing than the non-intervention group at 6-10 hours (p=0.006), t value 6.88, 20-24 hours and 40-48 hours, with a p value p=0.067 with t value 4.66 and p<0.001 with t value 3.97 respectively. These results imply that the perineal care bundle intervention (5% betadine with 20 ml normal saline, sterile gauze pieces and changed the sterile sanitary pads frequently) initially benefits wound healing than perineal care done by them selfcare. Table 4.3.3.

Table 4.3.4: The mean REEDA Scales Scores among two study groups 6 to 10 hours n=174

Wound healing process 6 to 10 hours							
Variables	**Intervention Group**		**Non-intervention Group**		**Total**	**t. Value**	**P -Value**
	n_1	**Mean ± SD**	**n_2**	**Mean ± SD**	**N**		
Redness	85	2.94 ± 0.24	89	2.98± 0.15	174	1.21	0.014
Edema	85	2.35± 0.48	89	2.57 ± 0.56	174	2.77	0.079
Ecchymosis	85	0.02± 0.22	89	0.26 ± 0.57	174	1.02	0.04

Note: p-value <0.05 Significant has been estimated independent t- test

Table 4.3.4 illustrates the mean REEDA (Redness, Edema, Ecchymosis, Discharge, and Approximation) scale scores for both study groups over a 6 to 10-hour period. Within this time frame, the "Intervention" group showed significantly lower redness (mean ± SD: 2.94 ± 0.24) compared to the "Non-intervention" group (2.98 ± 0.15), with a t-value of 1.21 and a p-value of 0.014, indicating a modest difference. However, no significant difference was observed in edema (p=0.079), where the Intervention group (2.35 ± 0.48) displayed statistically lower scores compared to the "Non-intervention" group (2.57 ± 0.56). Remarkably, ecchymosis was notably lower in the Intervention group (0.02 ± 0.22) than in the Non-intervention group (0.26 ± 0.57), with a t-value of 1.02 and a p-value of 0.04. These results suggest that within the 6 to 10-hour timeframe, the Intervention group exhibited reduced redness and ecchymosis compared to the Non-intervention group, while no significant difference was noted in edema. Table 4.3.4.

Table 4.3.5: The mean REEDA Scales Scores among two study groups 20 to 24 hours n=174

Wound Healing Process 20 to 24 Hours							
Variables	**Intervention Group**		**Non-intervention Group**		**Total**	**t. Value**	**P - Value**
	n1	Mean ± SD	n2	Mean ± SD	N		
Redness	85	1.01 ± 0.29	89	1.11 ± 0.35	174	2.06	0.011
Edema	85	1.99± 0.24	89	2.54± 0.59	174	8.12	<0.001
Ecchymosis	85	0.11± 0.40	89	0.26 ± 0.56	174	2.01	<0.001

Note: p-value <0.05 has been estimated independent t- test

Table 4.3.5 showcases the mean REEDA (Redness, Edema, Ecchymosis, Discharge, and Approximation) scale scores for both study groups within the 20 to 24-hour time frame. Notably, the Intervention group displayed significantly lower redness (mean ± SD: 1.01 ± 0.29) compared to the Non-intervention group (1.11 ± 0.35), with a t-value of 2.06 and a p-value of 0.011. Additionally, edema was notably lower in the Intervention group (1.99 ± 0.24) than in the "Non-intervention" group (2.54 ± 0.59), with a t-value of 8.12 and a p-value <0.001, indicating reduced swelling in the Intervention group. Moreover, ecchymosis was significantly lower in the Intervention group (0.11 ± 0.40) compared to the "Non-intervention" group (0.26 ± 0.56), with a t-value of 2.01 and a p-value <0.001. These findings suggest that during the 20 to 24-hour wound healing period, the Intervention group demonstrated decreased redness, edema, and ecchymosis compared to the Non-intervention group, indicating enhanced wound healing outcomes. Table 4.3.5.

Table 4.3.6: The mean REEDA Scales Scores among two study groups 40 to 48 hours n=174

Wound Healing Process 40 to 48 Hours							
Variables	**Intervention Group**		**Non-intervention Group**		**Total**	**t. value**	**P -value**
	n_1	**Mean ± SD**	**n_2**	**Mean ± SD**	**N**		
Redness	85	0	89	0	174	3.805	-
Edema	85	0.08± 0.28	89	0.30.± 0.46	174	0	<0.001
Ecchymosis	85	0	89	0	174	0	-

Note: p-value< 0.05 has been estimated independent t- test

In the context of wound healing within the 40 to 48-hour timeframe, the table indicates that both the Intervention and Non-intervention groups displayed no observable redness, edema, or ecchymosis. These findings are reflected in the mean REEDA (Redness, Edema, Ecchymosis, Discharge, and Approximation) scale scores, where values for these variables are nearly zero. Furthermore, statistical analysis revealed a significant difference in edema (p-value <0.001), favoring the "Intervention" group, signifying reduced swelling. However, redness and ecchymosis did not exhibit a significant difference between the two groups. Overall, during the 40 to 48-hour period, both groups demonstrated minimal signs of inflammation, while the "Intervention" group notably showed reduced edema (Table 4.3.6).

Table 4.3.7: Pain Intensity (Visual Analog Scale) at Different Time Durations Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-Intervention), n=174

		Pain Intensity in Different Time Duration							
Pain Intensity After Episiotomy		**Intervention Group**		**Non-intervention**		**Total**		**Chi-Square (df)**	**p-Value**
		n1	**%**	**n2**	**%**	**N**	**%**		
6 to 10 Hours	None	0	0	0	0	0	0	0.573(1)	0.449
	Mild	0	0	0	0	0	0		
	Moderate	5	5.8	3	3.4	8	4.6		
	Worse	81	94.2	85	96.6	166	95.4		
20 to 24 Hours	None	0	0	0	0	0	0	25.875 (2)	<0.001
	Mild	72	83.7	42	47.7	114	65.5		
	Moderate	14	16.3	42	47.7	56	32.2		
	Worse	0	0	4	4.5	4	2.3		
40 to 48 Hours	None	73	84.9	60	68.2	133	76.4	6.736 (1)	0.009*
	Mild	13	15.1	28	31.8	41	23.6		
	Moderate	0	0	0	0	0	0		
	Worse	0	0	0	0	0	0		

Note significant level p value p<0.05

The episiotomy wound pain intensity was measured using the visual analogue scale, and the chi-square test assessed the association between pain intensity and groups. In the 6 to 10-hour period, 95.4% of participant mothers experienced heightened pain intensity. A higher proportion in the non-intervention group reported intensified pain at 96.6% compared to 94.2% in the intervention group; however, this difference lacked statistical significance. Table 4.3.7

During the 20 to 24-hour timeframe, the majority (65.5%) reported mild pain intensity. Within the non-intervention group, participants mainly reported moderate (47.7%) and mild (47.7%) pain, whereas in the intervention group, most experienced mild pain (83.7%), and the rest reported moderate pain (16.3%). The association between pain intensity and study groups was statistically significant (p<0.001).Table 4.3.7.

Approximately 76.4% reported no pain during the 40 to 48-hour period. Interestingly, a higher frequency of interventions reported no pain (84.9%) compared to non-interventions (68.2%), and this difference was statistically significant, as shown in Table 4.3.7.

Table 4.3.8: Episiotomy Wound Healing Process (REEDA Scale) at 6-10 Hours Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-Intervention) n=174

Wound Healing Process 6 to 10 Hours		Intervention Group	Non-intervention Group	Total	Chi-Square (df)	p-Value
		n (%)	n1 (%)	n2 (%)		
Redness	None	0	0	0	1.488 (1)	0.223
	Mild	0	0	0		
	Moderate	5(5.)9	2(2.2)	7(4)		
	Severe	80 (94.1)	87(97.8)	167(96)		
Edema	None	0	1(1.1)	1(0.6)	11.732 (2)	0.003*
	Mild	0	0	0		
	Moderate	55(64.7)	35(39.3)	90(51.7)		
	Severe	30(35.3)	53(59.6)	83(47.7)		
Ecchymosis	None	84(98.8)	89(100)	173(99.4)	1.053 (1)	0.305
	Mild	0	0	0		
	Moderate	1 (1.2)	0	1(0.6)		
	Severe	0	0	0		
Discharge	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		
Approximation	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		

Note: p-value <0.05 Significant

The REEDA scale measured the wound healing process in both groups. Within the 6 to 10-hour timeframe, the majority of participants (96%) displayed severe redness. Interestingly, the non-intervention group had a higher frequency of severe redness (97.8%) compared to the intervention group (94.1%), though this difference did not reach statistical significance. However, the association between wound healing, specifically edema, showed statistical significance (p=0.003). Notably, only one participant from the intervention group reported ecchymosis. None of the participants reported experiencing discharge or approximation issues, as outlined in Table 4.3.8.

Table 4.3.9: Episiotomy Wound Healing Process (REEDA Scale) at 20-24 Hours Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-Intervention), n=174

Wound Healing Process 20 to 24 Hours		**Intervention Group**	**Non-intervention Group**	**Total**	**Chi-Square (df)**	**p Value**
		n (%)	**n1 (%)**	**n (%)**		
Redness	None	3(3.5)	0	3(1.7)	5.269	153
	Mild	78(91.8)	80(89.9)	158(90.8)		
	Moderate	4(4.7)	8(9)	12(6.9)		
	Severe	0	1(1.1)	1(0.6)		
Edema	None	0	1(1.1)	1(0.6)	64.878 (3)	0.000*
	Mild	3(3.5)	1(1.1)	4(2.3)		
	Moderate	80(94.1)	35(39.8)	115(66.5)		
	Severe	2(2.4)	51(58)	53(30.6)		
Ecchymosis	None	79(92.9)	72(80.9)	151(86.8)	5.807 (2)	0.055
	Mild	3 (3.5)	11(12.4)	14(98)		
	Moderate	3(3.5)	6(6.7)	9(5.2)		
	Severe	0	0	0		
Discharge	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		
Approximation	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		

Note: p-value <0.05 Significant

The REEDA scale assessed the wound healing process. Within the 20-24-hour timeframe, the majority of participant mothers (90.8%) exhibited mild redness. Notably, the non-intervention group showed a prevalence of mild redness at 89.9%, while the intervention group had a similar proportion at 91.8%. However, there wasn't a significant association observed between wound healing within the 20-24-hour period among the intervention and non-intervention groups Table 4.3.9.

Regarding edema, a significant majority of the intervention group (94.1%) experienced moderate edema, while in the non-intervention group, 58% faced severe edema. The association between the wound healing process (edema) exhibited statistical significance (p<0.001) among the groups, as outlined in Table 4.3.9.

Table 4.3.10: Episiotomy Wound Healing Process (REEDA Scale) at 40-48 Hours Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-Intervention), n=174

Wound Healing Process 40 to 48 Hours		Intervention Group	Intervention Group	Total	Chi-Square (df)	p Value
		n (%)	n1 (%)	n2 (%)		
Redness	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		
Edema	None	78(91.8)	62(69.7)	140(80.5)	13.508	0.000*
	Mild	7(8.2)	27(30.3)	34(19.5)		
	Moderate	0	0	0		
	Severe	0	0	0		
Ecchymosis	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		
Discharge	None	85 (100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		
Approximation	None	85(100)	89(100)	174(100)	-	-
	Mild	0	0	0		
	Moderate	0	0	0		
	Severe	0	0	0		

Note: p-value <0.05 Significant

No participants showed signs of redness, ecchymosis, discharge, or approximation within the 40 to 48-hour timeframe. However, among the non-intervention group, 30.3% exhibited mild edema, while in the intervention group, 8.2% had mild edema. This difference demonstrated a significant association, with a p-value of <0.001 between the groups, as outlined in Table 4.3.10.

4.4 Section IV: This section presents the results related to the primary objective, focusing on the association between demographic characteristics and outcomes of high vaginal swab culture (infection) among mothers admitted to the labor and postnatal ward at the selected tertiary care hospital.

Table 4.4.1: Demographic Characteristics and High Vaginal Swab Culture Outcomes (Infection) Among Mothers in Labor and Postnatal Wards at Selected Tertiary Care Hospital n=334

Demographic and High Vaginal Swab Culture Outcomes (Infection)							
Background Characteristics		**Intervention Group**		**Non-Intervention Group**		**Chi-Square (df)**	**p – Value**
		Yes	**No**	**Yes**	**No**		
		n1(%)	**n2 (%)**	**n1(%)**	**n2(%)**		
Age of Mother	20 – 25	0	123(100)	11(10.8)	91(89.2)	1.001(3)	0.801
	26 – 30	0	16(100)	3(10)	27(90)		
	31 – 35	0	23(100)	2(6.7)	28(93.3)		
	36 ≥	0	5(100)	0	5(100)		
Religion	Hindu	0	136(100)	10 (8)	115(92)	1.712(2)	0.425
	Muslim	0	22(100)	5(15.6)	27(84.4)		
	Others	0	9(100)	1(10)	9(90)		
Education of Mothers	Post Graduate	0	26(100)	4(9.8)	37(90.2)	0.579 (4)	0.965
	Secondary Level	0	21(100)	2(11.1)	16(88.9)		
	PUC Level	0	67(100)	5(9.8)	46(90.2)		
	Bachelor Level	0	48(100)	4(7.8)	47(92.2)		
	Illiterate and Primary	0	5(100)	1(16.7)	5(83.3)		
Occupation	Government Service	0	38(100)	3(7.3)	38(92.7)	2.292 (4)	0.682
	Agriculture	0	44(100)	3(9.4)	29(90.6)		
	Private Service	0	33(100)	3(7.7)	36(92.3)		
	House Wife	0	9(100)	0	6(100)		
	Others	0	43(100)	7(14.3)	42(85.7)		

Note: p-value <0.05 Significant

The chi-square test was utilized to explore the correlation between high vaginal swab culture outcomes and demographic characteristics among mothers in both the intervention and non-intervention groups. In the non-intervention group, an incidence of 10.8% for Candida albicans infection was observed among mothers aged 20 to 25 years. Similarly, among participant mothers with an educational level of illiteracy and primary education, the infection rate with Candida albicans was noted at 16.7%. Moreover, an incidence of 14.3% for Candida albicans infection was identified among participant mothers categorized under the 'Others' occupational category, as presented in Table 4.4.1.

Table 4.4.2: Demographic Characteristics and High Vaginal Swab Culture Outcomes Related to Perineal Infection Among Mothers in Labor and Postnatal Wards at Selected Tertiary Care Hospital n=334

Demographic and High Vaginal Swab Culture Outcomes							
Demographic Characteristics		**Intervention Group**		**Non-Intervention Group**		**Chi-Square (df)**	**p – value**
		Yes	**No**	**Yes**	**No**		
		n1(%)	**n2 (%)**	**n1(%)**	**n2(%)**		
Dietary Pattern	Mixed Diet	0	73(100)	5(7.6)	61(92.4)	1.028 (2)	0.598
	Pure Vegetarian	0	37(100)	3(8.1)	34(91.9)		
	Vegetarian With Egg	0	56(100)	8(12.5)	56(87.5)		
Hb Level of Mothers	Normal Hb Level	0	125(100)	10(8.5)	107(91.5)	9.231(3)	.026*
	Moderate Anemic	0	9(100)	2(18.2)	9(81.8)		
	Mild Anemic	0	27(100)	2(5.7)	33(94.3)		
	Severe Anemic	0	6(100)	2(50)	2(50)		
ANC Visits	4 ≥ ANC Vistis	0	151(100)	15(9.6)	142(90.4)	0.002(1)	0.963
	< 4 ANC Vistis	0	16(100)	1(10)	9(90)		
Family Monthly Income	20000+	0	89(100)	8(7.8)	94(92.2)	1.389 (1)	0.708
	5000 – 9999	0	11(100)	1(10)	9(90)		
	10000 – 19999	0	47(100)	5(14.7)	29(85.3)		
	Less than 5000	0	20(100)	2(9.5)	19(90.5)		
Type of Marriage	Non-consanguineous	0	145(100)	14(10.1)	124(89.9)	0.292 (1)	0.589
	Consanguineous	0	22(100)	2(6.9)	27(93.1)		

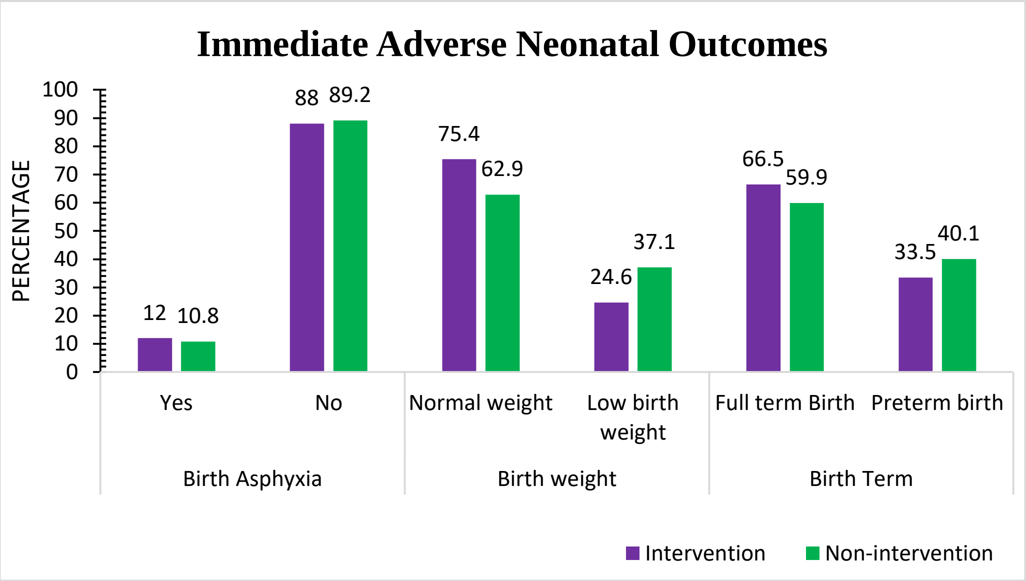
Note: p-value <0.05 Significant

The chi-square test was utilized to investigate the association between high vaginal swab culture outcomes and demographic characteristics among mothers in both the intervention and non-intervention groups. A statistically significant correlation was found between the participants' mothers' hemoglobin (Hb) levels (p=0.026) and high vaginal swab culture outcomes, particularly candida albicans infection. The infection incidence was notably higher in mothers with severe anemia (50%) in the non-intervention group. However, no significant association was observed between demographic factors and high vaginal swab culture outcomes in the intervention group. In terms of the outcomes from the high vaginal swab culture, a

14.7% incidence of candida albicans infection was observed within the Non-intervention group. This rate was particularly notable among participants whose monthly family income fell within the range of 10,000 to 19,999. Similarly, an incidence of 10.1% for candida albicans infection was identified based on the type of marriage within the non-intervention group, as delineated in table 4.4.2.

4.5. Section V: This section presents the results pertaining to the secondary objective, focusing on immediate adverse pregnancy outcomes among mothers admitted to the labour room and postnatal ward in the tertiary care hospital.

Figure 4.5.2 Immediate Adverse Neonatal Outcomes n=334



Among the participant mothers, 12% in the intervention group and 10.8% in the non-intervention group gave birth to newborns with birth asphyxia. Similarly, a higher percentage of participant mothers (37.1%) in the non-intervention group had newborns with low birth weight compared to the intervention group, which accounted for 24.6%. This discrepancy revealed a statistically significant association, with a chi-square value of 0.119 and a p-value below 0.013.Figure 4.5.2.

Moreover, participant mothers who gave birth to newborns with preterm births were more frequent (40.1%) among the non-intervention group. Conversely, 33.5% experienced preterm birth in the intervention group. However, it is important to highlight that this association did not attain statistical significance, as elucidated in figure 4.5.2.

Figure 4.5.3 Immediate Adverse Maternal Outcomes n=334

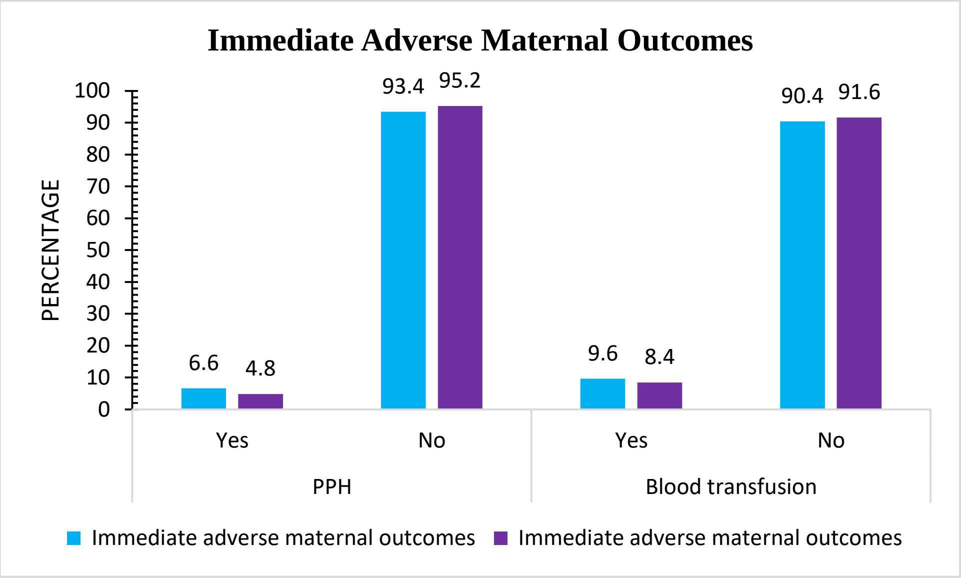


Figure 4.5.3: Only 5.7% of all participant mothers experienced postpartum hemorrhage. Among them, a higher incidence of postpartum hemorrhage cases was observed within the intervention group (6.6%) compared to the non-intervention group's rate of 4.8%. Additionally, just 9% of all mothers required blood transfusions. In the intervention group, 9.6% received blood transfusions, while in the non-intervention group, the figure stood at 8.4%, as depicted in figure 4.5.2.

4.6. Section VI: This section outlines the findings pertaining to the secondary objective, which explores the relationship between high vaginal swab culture outcomes and immediate adverse pregnancy outcomes among mothers admitted to the labor room and postnatal ward in a tertiary care hospital.

Table 4.6.1: Association Between Immediate Adverse Neonatal Outcomes and High Vaginal Swab Culture Outcomes (Infection) in Intervention and Non-intervention Groups n=334

Neonatal Outcomes		**Outcomes of High Vaginal Swab Culture**						**Chi-square (df)**	**p-value**
		Intervention Group			**Non-Intervention Group**				
		Yes n1 (%)	**No n2 (%)**	**N**	**Yes n1 (%)**	**No n2 (%)**	**N**		
Birth Asphyxia	No	0	147(100)	147	15(10.1)	134(89.9)	149	0.377	0.539
	Yes	0	20(100)	20	1(5.6)	17(94.4)	18		
Birth Weight	Normal weight	0	126(100)	126	9 (8.6)	96(91.4)	105	0.333	0.564
	Low birth weight	0	41(100)	41	7 (11.3)	55(88.7)	62		
Term of Birth	Full term Birth	0	111(100)	111	8 (8)	92(92)	100	0.564	0.396
	Preterm birth	0	56(100)	56	8(11.9)	59(88.1)	67		

Note: p-value <0.05 Significant

The chi-square test was used to explore the association between perineal care intervention (infection) and immediate adverse neonatal outcomes. However, no statistically significant association was found between perineal care intervention and variables such as birth weight, term of birth, and birth asphyxia. Table 4.6.1.

Interestingly, among mothers who gave birth to newborns without birth asphyxia, there was a 10.1% incidence of Candida albicans infection. In contrast, within the non-intervention group, mothers who gave birth to newborns with cases of birth asphyxia had a 5.6% incidence of Candida albicans infection. Similarly, within the non-intervention group, 11.3% of mothers who delivered newborns with low birth weight and 11.9% of participant mothers who gave birth prematurely were associated with Candida albicans infection, as illustrated in Table 4.6.1.

Table 4.6.2: Association Between High Vaginal Swab Culture Outcomes (Infection) and Immediate Adverse Maternal Outcomes in Intervention and Non-intervention Groups n=334

Immediate Adverse Maternal Outcomes		**Outcomes of High Vaginal Swab Culture**							
		Intervention group			**Non-intervention group**			**Chi Square**	**p Value**
		Yes	**No**	**N**	**Yes**	**No**	**N**		
Blood Transfusion	Yes	0	16(100)	16	4(28.6)	10(71.4)	14	6.362	.012*
	No	0	151(100)	151	12(7.8)	141(92.2)	153		
PPH	Yes	0	11(100)	11	0	8(100)	8	0.89	0.345
	No	0	156(100)	156	16 (10.1)	143(89.9)	159		

Note: p-value <0.05 Significant

The chi-square test was used to examine the association between perineal care intervention and immediate adverse maternal outcomes. A statistically significant association was identified, with 28.6% of cases demonstrating Candida albicans infection in the non-intervention group. This association was supported by a statistically significant chi-square value of 6.362 and a p-value of 0.012, as detailed in Table 4.6.2.

4.7. VII: This section shows the result in accordance to the secondary objective determinants of immediate adverse pregnancy outcomes.

Table 4.7.1: Determinants of Birth Asphyxia among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention) n=334

Age of Mother	**Determinants of Birth Asphyxia**		**Non-intervention Group OR (95% CI)**	**p-Value**
	Intervention Group			
	OR (95% CI)	**p-Value**		
20 – 25	1		1	
26 – 30	-	-	48.37 (1.29, 1815.89)	0.036
31 – 35	-	-	0.2 (0, 10.06)	0.421
36 ≥	147.67 (1.95, 196.72)	0.024*	-	-
Religion				
Hindu	1		1	
Muslim	0.36 (0.01, 13.65)	0.582	0.21 (0.02, 2.02)	0.175
Others	143.21 (7.41, 2766.54)	0.001*	13.63 (0.6, 308.61)	0.101
Education Level of Mothers				
Postgraduate Level	1		1	
Secondary	0.02 (0, 1.02)	0.051	-	-
PUC Level	1.25 (0.17, 8.95)	0.828	3.19 (0.39, 26.15)	0.281
Bachelor Level	0.79 (0.09, 6.97)	0.833	1.06 (0.12, 9.31)	0.957
Illiterate and Primary	2.72 (0, 17543.73)	0.823	8.98 (0.32, 252.13)	0.197

Note: p-value <0.05 Significant

The odds ratio for birth asphyxia was notably higher among mothers aged 36 years and above in the intervention group, measuring at 147.67 (1.95, 196.72), with a p-value of 0.024. Concerning maternal education, the lowest incidence of birth asphyxia was observed among those with a secondary level of education, where the odds ratio was 0.02 (0, 1.02), lower than that for the postgraduate level. This difference held statistical significance with a p-value of 0.051, as detailed in Table 4.7.1.

Table 4.7.2 : Determinants of Birth Asphyxia Among Mothers who Gave Birth to Newborns Labor and Postnatal Wards (Intervention vs. Non-intervention) n=334

Demographic Characteristics	Determinants of birth asphyxia			p-Value
	Intervention Group		Non-intervention Group	
	OR (95% CI)	p- Value	OR (95% CI)	
Residence				
Urban	1		1	
Semi Urban	0.07 (0.01, 1.14)	0.062	0.7 (0.07, 6.72)	0.753
Rural	0.34 (0.04, 3.01)	0.334	0.35 (0.05, 2.64)	0.306
Occupation				
Government service	1		1	
Agriculture	0.45 (0.07, 3.07)	0.417	0.17 (0.01, 2.55)	0.202
Private Service	0.12 (0.01, 1.76)	0.122	0.11 (0.01, 1.58)	0.104
House Wife	-	-	0.82 (0.03, 25.04)	0.908
Others	0.1 (0.01, 1.3)	0.079	4.67 (0.64, 34.15)	0.129
Dietary Pattern of Mothers				
Mixed	1		1	
Pure Vegetarian	1.05 (0.12, 9.44)	0.968	15.89 (1.42, 178.26)	0.025*
Vegetarian With Egg	2.11 (0.35, 12.82)	0.42	5.07 (0.53, 48.23)	0.158
Monthly Family Income				
20000+	1		1	
5000 – 9999	0.59 (0.03, 13.57)	0.742	7.19 (0.36, 143.71)	0.197
10000 – 19999	1.94 (0.41, 9.15)	0.402	0.47 (0.06, 4.08)	0.496
< 5000	-	-	0.02 (0, 3.32)	0.132

Note: p-value <0.05 Significant

The odds ratio for birth asphyxia exhibited an increase among urban residents in both the intervention and non-intervention groups. Among participant mothers consuming a pure vegetarian diet, a significantly higher odds ratio for birth asphyxia was observed at 15.89 (1.42, 178.26) with a p-value of 0.025 in the non-intervention group. Similarly, participant mothers with a monthly family income ranging from 10,000 to 19,999 showed an increased odds ratio of 1.94 (0.41, 9.15) for birth asphyxia in the intervention group, as illustrated in Table 4.7.2.

Table 4.7.3:Determinants of Birth Asphyxia Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention)

n=334

Demographic Characteristics	**Determinants of birth asphyxia**			**p-Value**
	Intervention Group		**Non-intervention Group**	
	OR (95% CI)	**p-Value**	**OR (95% CI)**	
Normal Hb	1		1	
Moderate Anaemia	45.02 (2.45, 826.96)	0.01	2.01 (0.05, 84.6)	0.715
Mild Anaemia	1.21 (0.1, 14.22)	0.881	18.62 (2.84, 122.14)	0.002*
Severe Anaemia	-	-	-	-
Total ANC Visits				
4 ≥ANC visits	1		1	
< 4 ANC visits	9.86 (0.59, 166.11)	0.112	3.83 (0.07, 198.52)	0.505
Parity				
Primi	1		1	
Multi	0.26 (0.05, 1.43)	0.12	0.29 (0.05, 1.67)	0.167
Smoking Habit				
Yes	1		1	
No	0.4 (0.05, 3.49)	0.407	0.22 (0.01, 7.01)	0.392
Alcoholic Habit				
Yes	1		1	
No	0.03 (0, 0.68)	0.028*	0.01 (0, 0.37)	0.013*
Type of Marriage				
Non consanguineous	1		1	
Consanguineous	2.85 (0.29, 27.89)	0.368	4.85 (0.72, 32.73)	0.105

Note: p-value <0.05 Significant

Mothers with moderate anaemia showed a significantly higher odds ratio for birth asphyxia, measuring 45.02 (2.45, 826.96) with a p-value of 0.01 in the intervention group. Conversely, women with mild anaemia exhibited a significantly higher odds ratio for birth asphyxia, measuring 18.62 (2.84, 122.41) with a p-value of 0.002 in the non-intervention group. Table 4.7.3.

Additionally, mothers who attended antenatal care fewer than 4 times displayed an elevated odds ratio of birth asphyxia, at 9.86 (0.59, 166.11). Primiparous mothers also exhibited higher odds ratios for birth asphyxia. Smoking mothers showed higher odds ratios for birth asphyxia in both groups Table 4.7.3.

Furthermore, alcohol-consuming mothers had significantly elevated odds ratios for birth asphyxia, measuring 0.03 (0, 0.68) with a p-value of 0.028 in the intervention group and 0.01 (0, 0.37) with a p-value of 0.013 in the non-intervention group. Lastly, mothers in consanguineous marriages displayed higher odds ratios for birth asphyxia, measuring 2.85 (0.29, 27.89) and 4.85 (0.72, 32.73) in the intervention and non-intervention groups, as shown in Table 4.7.3.

Table 4.7.4 : Determinants of Low Birth Weight Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention). n=334

Demographic Characteristics	Determinants of Low Birth Weight			
	Intervention Group		**Non-intervention Group**	**p- Value**
	OR (95% CI)	**p- Value**	**OR (95% CI)**	
Age of Mothers				
20 – 25	1		1	
26 – 30	2.51 (0.7, 9.02)	0.159	1.05 (0.37, 2.94)	0.934
31 – 35	0.77 (0.21, 2.81)	0.695	1.08 (0.4, 2.9)	0.884
36 ≥	4.56 (0.32, 65.43)	0.264	-	-
Religion of Mothers				
Hindu	1		1	
Muslim	0.22 (0.04, 1.34)	0.1	0.88 (0.33, 2.36)	0.794
Others	4.16 (0.77, 22.38)	0.097	0.62 (0.1, 3.86)	0.606
Education Level				
Postgraduate Level	1		1	
Secondary	0.33 (0.05, 2.04)	0.234	1.69 (0.42, 6.78)	0.457
PUC Level	1.22 (0.35, 4.2)	0.752	0.77 (0.27, 2.17)	0.615
Bachelor Level	0.51 (0.13, 1.97)	0.329	1.12 (0.42, 2.99)	0.822
Illiterate and Primary	-	-	0.78 (0.1, 6.29)	0.813

Note: p-value <0.05 Significant

An elevated odds ratio for low birth weight was observed among participant mothers aged 36 and above, measuring 4.56 (0.32, 65.43) in the intervention group. Conversely, among the non-intervention group, participant mothers aged 31 to 35 years exhibited a slightly higher odds ratio of 1.08 (0.4, 2.9) for low birth weight. Table 4.7.4.

Regarding maternal education, those with pre-university courses demonstrated a higher odds ratio for low birth weight, measuring 1.22 (0.35, 4.2) in the intervention group. Conversely, among the non-intervention group, those with a secondary level of education exhibited a higher odds ratio of 1.69 (0.42, 2.99), as detailed in Table 4.7.4.

Table 4.7.5: Determinants of Low Birth Weight Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention) n=334

Demographic Characteristics	Determinants of Low Birth Weight			p-Value
	Intervention Group		Non-intervention Group	
	OR (95% CI)	p- value	OR (95% CI)	
Residence				
Urban	1		1	
Semi Urban	0.95 (0.29, 3.1)	0.93	1.44 (0.51, 4.07)	0.492
Rural	0.78 (0.27, 2.28)	0.653	0.48 (0.19, 1.22)	0.122
Occupation				
Government Service	1		1	
Agriculture	0.56 (0.17, 1.83)	0.334	0.88 (0.28, 2.76)	0.826
Private Service	0.48 (0.13, 1.8)	0.273	0.27 (0.09, 0.84)	0.023*
House wife	0.65 (0.08, 5.39)	0.688	0.1 (0.01, 1.25)	0.074
Others	0.39 (0.1, 1.46)	0.161	0.33 (0.12, 0.96)	0.043*
Dietary Pattern				
Mixed diet	1		1	
Pure Vegetarian	0.73 (0.21, 2.55)	0.619	0.5 (0.18, 1.38)	0.179
Vegetarian With Egg	0.79 (0.3, 2.08)	0.637	0.6 (0.25, 1.42)	0.247
Monthly Family Income				
20000+	1		1	
5000 – 9999	0.73 (0.11, 4.69)	0.739	1.71 (0.37, 7.99)	0.497
10000 – 19999	0.88 (0.31, 2.5)	0.815	2.55 (0.92, 7.13)	0.073
Less than 5000	2.19 (0.55, 8.7)	0.264	3.44 (1.05, 11.29)	0.042*

Note: p-value <0.05 Significant

Mothers residing in semi-urban areas within the non-intervention group showed a higher odds ratio for low birth weight, measuring 1.44 (0.51, 6.78). Interestingly, those employed in private services and falling within the 'Others' category observed significantly lower odds ratios for low birth weight, at 0.27 (0.09, 0.84) with a p-value of 0.023, and 0.33 (0.12, 0.96) with a p-value of 0.043, respectively. Table 4.7.5.

Additionally, mothers with a monthly family income of less than 5000 rupees showed higher odds ratios for low birth weight, measuring 2.19 (0.55, 8.7) in the intervention group. Similarly, within the non-intervention group, mothers in the same income bracket had significantly higher odds ratios for low birth weight, measuring 3.44 (1.05, 11.29), with a p-value of 0.042, as presented in Table 4.7.5.

Table 4.7.6 : Determinants of Low Birth Weight Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention) **n=334**

Demographic Characteristics	Determinants of low birth weight			p- value
	Intervention group		**Non-intervention group**	
	OR (95% CI)	**p- value**	**OR (95% CI)**	
Hb Level During Labour				
Normal Hb	1		1	
Moderate Anaemic	5.01 (0.87, 28.99)	0.072	0.41 (0.07, 2.5)	0.335
Mild Anaemic	0.51 (0.13, 1.98)	0.333	0.8 (0.31, 2.09)	0.652
Severe Anaemic	0.66 (0.07, 5.96)	0.708	0.25 (0.02, 3.18)	0.283
Total ANC Visit				
4 ≥ANC Visits	1		1	
< 4 ANC Visits	-	-	0.84 (0.18, 3.93)	0.823
Parity				
Primi	1		1	
Multi	1.74 (0.72, 4.19)	0.216	0.51 (0.23, 1.11)	0.09
Smoking Habit				
Yes	1		1	
No	1.19 (0.3, 4.66)	0.803	0.37 (0.07, 2.06)	0.257
Alcoholic Habits				
Yes	1			
No	0.63 (0.05, 7.72)	0.717	-	-
Type of Marriage				
Non consanguineous	1			1
Consanguineous	0.65 (0.21, 2.04)	0.459	1.75 (0.78, 3.93)	0.175

Note: p-value <0.05 Significant

Table 4.7.6: presents the following insights: Among participant mothers with moderate anaemia in the intervention group, a higher odds ratio for low birth weight was observed, measuring 5.01 (0.87, 28.99). Similarly, multiparous mothers in the

intervention group exhibited an elevated odds ratio of 1.74 (0.72, 4.19) for low birth weight. In the non-intervention group, mothers with a smoking habit showed a higher odds ratio for low birth weight, measuring 0.37 (0.07, 2.06). Table 4.7.6.

Moreover, mothers in the intervention group with an alcohol habit displayed higher odds ratios for low birth weight. Additionally, among non-intervention group mothers with a consanguineous type of marriage, there was a higher odds ratio of 1.75 (0.78, 3.93) for low birth weight, as detailed in Table 4.7.6.

Table 4.7.7: Determinants of Preterm Birth Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention)

n=334

Demographic Characteristics	**Determinants of preterm birth**			
	Intervention group		**Non-intervention group**	**p- value**
	OR (95% CI)	**p- value**	**OR (95% CI)**	
Age of Mothers				
20 – 25	1		1	
26 – 30	3.76 (1.12, 12.67)	0.033*	0.72 (0.27, 1.97)	0.527
31 – 35	0.85 (0.25, 2.85)	0.792	1.02 (0.39, 2.69)	0.973
36≥	0.42 (0.02, 7.68)	0.561	0.14 (0.01, 1.54)	0.108
Religion				
Hindu	1		1	
Muslim	0.74 (0.22, 2.48)	0.623	0.62 (0.22, 1.71)	0.353
Others	0.16 (0.01, 1.77)	0.135	1.37 (0.3, 6.22)	0.683
Education Level of Mothers				
Postgraduate Level	1		1	
Secondary	2.54 (0.59, 10.88)	0.21	1.7 (0.44, 6.6)	0.441
PUC Level	0.99 (0.3, 3.24)	0.98	1.36 (0.49, 3.77)	0.557
Bachelor Level	1.12 (0.32, 3.95)	0.856	0.9 (0.33, 2.46)	0.839
Illiterate and Primary Level	-	-	1.14 (0.15, 8.57)	0.903

Note: p-value <0.05 Significant

Table 4.7.7 presents the following findings: In the intervention group, mothers aged between 26 and 30 years displayed a significantly higher odds ratio for preterm birth, measuring 3.76 (1.12, 12.67), with a p-value of 0.033. Conversely, within the non-intervention group, mothers aged 31 to 35 years exhibited a slightly increased odds ratio for preterm birth, measuring 1.02 (0.39, 2.69). Table 4.7.7.

Participant mothers with secondary education observed higher odds ratios for preterm birth, measuring 2.54 (0.59, 10.88) within the intervention group. In contrast, there was a higher odds ratio for preterm birth among those with illiterate and primary level education, measuring 1.14 (0.15, 8.57) within the non-intervention group (Table 4.7.7).

Table 4.7.8 : Determinants of Preterm Birth Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention)

n=334

Demographic Characteristics	**Determinants of preterm of birth**			**p-value**
	Intervention group	**p- value**	**Non-intervention group**	
	OR (95% CI)		**OR (95% CI)**	
Residence				
Urban	1			
Semi Urban	1.34 (0.44, 4.03)	0.608	0.46 (0.17, 1.2)	0.111
Rural	1.88 (0.67, 5.24)	0.229	0.25 (0.1, 0.64)	0.004*
Occupation				
Government Service	1			
Agriculture	0.69 (0.22, 2.18)	0.53	0.45 (0.15, 1.37)	0.159
Private Service	1.12 (0.34, 3.7)	0.85	0.2 (0.06, 0.6)	0.005*
House Wife	1.24 (0.2, 7.62)	0.816	0.29 (0.04, 2.42)	0.255
Others	0.6 (0.19, 1.91)	0.384	0.32 (0.11, 0.9)	0.031*
Dietary Pattern				
Mixed Diet	1			
Pure Vegetarian	0.64 (0.21, 1.98)	0.442	2.19 (0.83, 5.79)	0.114
Vegetarian but Consume Egg	1.21 (0.52, 2.83)	0.663	1.02 (0.44, 2.37)	0.969
Monthly Family Income				
20000+	1			
5000 – 9999	5.38 (1.07, 27.16)	0.042*	0.28 (0.05, 1.55)	0.144
10000 – 19999	1.38 (0.54, 3.52)	0.5	1.08 (0.42, 2.76)	0.878
Less than 5000	0.42 (0.09, 1.93)	0.267	0.8 (0.24, 2.68)	0.716

Note: p-value <0.05 Significant

A comprehensive overview of the findings reveals several insights: Mothers residing in rural areas exhibited a higher odds ratio for preterm birth at 1.88 (0.67, 5.24) in the intervention group. Conversely, in the non-intervention group, those residing in rural areas demonstrated significantly lower odds ratios for preterm birth, with a p-value of 0.004. Table 4.4.8.

Among housewives in the intervention group, a slightly elevated odds ratio for preterm birth was observed at 1.24 (0.2, 7.62). In contrast, the non-intervention group showed significantly lower odds ratios for preterm birth among those employed in the private sector (0.2 (0.06, 0.6), p = 0.005) and those categorized as 'Others' (0.32 (0.11, 0.9), p = 0.031).Table 4.7.8.

Regarding dietary patterns, higher odds ratios for preterm birth were seen among mothers consuming a vegetarian diet with eggs (1.21 (0.52, 2.83)) in the intervention group, while pure vegetarian diets showed higher odds ratios (2.19 (0.83, 5.79)) in the non-intervention group. Notably, participant mothers with an income ranging from 5000 to 9999 rupees demonstrated a significantly elevated odds ratio for preterm birth (5.38 (1.07, 27.16)) with a p-value of 0.042 in the intervention group Table 4.7.8.

Conversely, in the non-intervention group, a slight elevation in odds ratio was observed for preterm birth among those with a monthly family income of 10,000 to 19,999 rupees (1.08 (0.42, 2.76)). Finally, mothers with moderate anaemia displayed higher odds ratios for preterm birth in both the intervention (1.91 (0.39, 9.37)) and non-intervention (2.36 (0.51, 10.8)) groups. These results are comprehensively detailed in Table 4.7.8.

Table 4.7.9: Determinants of Preterm Birth Among Mothers who Gave Birth to Newborns in Labor and Postnatal Wards (Intervention vs. Non-intervention)

n=334

Demographic Characteristics	Determinants of preterm birth			p-value
	Intervention group	p- value	Non-intervention group	
	OR (95% CI)		OR (95% CI)	
Hb Level During Labour				
Normal Hb	1			
Moderate Anaemia	1.91 (0.39, 9.37)	0.425	2.36 (0.51, 10.8)	0.27
Mild Anaemia	1.05 (0.37, 2.98)	0.925	1.12 (0.46, 2.76)	0.803
Severe Anaemia	0.77 (0.06, 10.1)	0.844	0.96 (0.1, 9.29)	0.973
Total ANC Visits				
4≥ ANC Visits	1			
<4 ANC Visits	0.1 (0.01, 1.01)	0.051	2.59 (0.57, 11.8)	0.218
Parity				
Primi	1			
Multi	0.73 (0.33, 1.61)	0.433	0.74 (0.36, 1.52)	0.411
Smoking Habit				
Yes	1			
No	1.79 (0.54, 5.97)	0.344	1.46 (0.35, 6.1)	0.607
Alcoholic Habits				
Yes	1			
No	0.42 (0.06, 3.01)	0.387	1.97 (0.31, 12.4)	0.471
Type of Marriage				
Non consanguineous	1			
Consanguineous	1.75 (0.78, 3.93)	0.175	0.4 (0.13, 1.24)	0.111

Foot note: P value <0.05 is significant

Mothers with moderate anaemia observed higher odds ratios for preterm birth, measuring 1.91 (0.39, 937) in the intervention group and 2.36 (0.51, 10.8) in the non-intervention group. Conversely, mothers with a smoking habit observed lower odds ratios for preterm birth in both the intervention and non-intervention groups, measuring 1.79 (0.54, 5.97) and 1.46 (0.35, 6.1), respectively. Similarly, mothers who consumed alcohol observed higher odds ratios for preterm birth within the intervention group, measuring 0.42 (0.06, 3.01). Furthermore, mothers in consanguineous marriages displayed a higher odds ratio for preterm birth, measuring 1.75 (0.78, 3.93) in the intervention group, as detailed in Table 4.7.9.

Table 4.7.10 : Determinants of Postpartum Hemorrhage Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-intervention) n=334

Demographic Characteristics	Determinants of PPH				p- value
	Intervention group	p-value	Non-intervention group		
	OR (95%CI)		OR (95%CI)		
Age of Mother					
20 – 25	1		1		
26 – 30	2.52 (0.22, 28.35)	0.455	0.91 (0.09, 9.43)		0.933
31 – 35	1.86 (0.27, 12.82)	0.527	0.69 (0.05, 9.85)		0.784
36≥	-	-	3.27 (0.14, 77.73)		0.463
Residence					
Urban	1		0.61 (0.14, 0)		0.606
Semi Urban	0.61 (0.14, 0)	0.606	0.42 (0.14, 0)		0.418
Rural	0.42 (0.14, 0)	0.418			
Occuation					
Government Service	1		1		
Agriculture	2.1 (0.36, 12.16)	0.407	0.53 (0.02, 12.41)		0.692
Private Service	1.09 (0.15, 8.01)	0.936	-		-
House Wife	-	-	-		-
Others	0.2 (0.01, 2.8)	0.232	6.15 (0.57, 66)		0.133
Education of Mothers					
Post Graduate	1		1		
Secondary	0.55 (0.03, 9.92)	0.685	2.76 (0.07, 117.17)		0.595
PUC	0.8 (0.11, 5.86)	0.822	2.54 (0.12, 54.96)		0.552
Bachelor	0.68 (0.08, 6.14)	0.734	1.68 (0.07, 41.93)		0.753
Illiterate and Primary	-	-	12.53 (0.25, 619.74)		0.204

Note: p-value <0.05 Significant

Mothers aged 26 to 30 years displayed a higher odds ratio for post-partum hemorrhage, measuring 2.52 (0.22, 28.35) within the intervention group. Conversely, among the non-intervention group, mothers aged 36 and above exhibited a higher odds ratio for post-partum hemorrhage, measuring 3.27 (0.14, 77.73).Table 4.7.10.

Additionally, mothers in agricultural occupations demonstrated a higher odds ratio for post-partum hemorrhage, measuring 2.1 (0.36, 12.16) in the intervention group. Moreover, mothers with an illiterate or primary level of education exhibited a higher odds ratio for post-partum hemorrhage, measuring 12.53 (0.25, 619.74) in the non-intervention group, as detailed in Table 4.7.10.

Table 4.7.11: Determinants of Postpartum Hemorrhage Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-intervention) n=334

Demographic Characteristics	Determinants of PPH			p- value
	Intervention group	p- value	Intervention group	
	OR (95%CI)		OR (95%CI)	
Monthly family income				
20000>	1		1	
5000 – 9999	-	0.998	1 (0, 0)	0.996
10000 – 19999	1.33 (0.18, 10.03)	0.784	0.33 (0.14, 0)	0.333
< 5000	0.59 (0.04, 9.87)	0.715	0.74 (3.76, 0)	0.74
Parity				
Primi	1		-	-
Multi	1.25 (0.32, 4.86)	0.749	-	-
Smoking Habit				
Yes	1		1	
No	0.71 (0.07, 7.83)	0.781	0.12 (0.01, 1.04)	0.054
Alcoholic Habit				
Yes	1		1	
No	1.16 (0.08, 17.35)	0.916	0.46 (0.04, 5.09)	0.527

Note: p-value <0.05 Significant

Participant mothers with a monthly family income exceeding 10,000 to 19,999 rupees demonstrated an elevated odds ratio for postpartum hemorrhage, measuring 1.33 (0.18, 10.03) in the intervention group. Moreover, within the intervention group, multiparous mothers observed a higher odds ratio for postpartum hemorrhage, measuring 1.25 (0.32, 4.86). Table 4.7.11.

Additionally, both the intervention and non-intervention groups displayed an increased odds ratio for postpartum hemorrhage among mothers with a smoking habit. Among the non-intervention group, mothers with an alcohol habit showed a higher odds ratio for postpartum hemorrhage, as detailed in Table 4.7.11.

Table 4.7.12 : Determinants of Blood Transfusion Among Mothers in Labor and Postnatal Wards (Case vs. Control Groups) n=334

Demographic Characteristics	Determinants of blood transfusion				p-value
	Intervention group	p- value	Non-intervention group		
	OR (95%CI)		OR (95%CI)		
Age of mother					
20 – 25	1		1		
26 – 30	0.41 (0.04, 4.23)	0.452	1.5 (0.28, 8.14)		0.638
31- 35	1.54 (0.23, 10.59)	0.659	1.64 (0.33, 8.23)		0.545
36≤	28.65 (1.07, 768.31)	0.046*	-		-
Education					
Post Graduate	1		1		
Secondary	0.83 (0.04, 19.91)	0.909	0.29 (0.01, 5.8)		0.414
PUC Level	2.95 (0.25, 34.35)	0.388	0.85 (0.17, 4.33)		0.844
Bachelor	1.95 (0.17, 23)	0.597	0.24 (0.04, 1.47)		0.122
Illiterate and Primary	-	-	-		-

Note: p-value <0.05 Significant

The table illustrates that mothers aged 36 years and above demonstrated a notably higher odds ratio for blood transfusion, measuring 28.65 (1.07, 768.31), with a p-value of 0.046, within the intervention group. Similarly, within the intervention group, mothers who pursued pre-university courses exhibited increased odds of blood transfusion, measuring 2.95 (0.25, 34.35), as presented in Table 4.7.12.

Table 4.7.13: Determinants of Blood Transfusion Among Mothers in Labor and Postnatal Wards (Intervention vs. Non-intervention) n=334

Demographic Characteristics	Determinants of blood transfusion			p- value
	Intervention group	p- value	Non-intervention group	
	OR (95%CI)		OR (95%CI)	
Occupation				
Government Service	1		1	
Agriculture	0.62 (0.14, 2.7)	0.525	1.1 (0.19, 6.29)	0.914
Private Service	-	-	0.45 (0.09, 2.19)	0.32
House Wife	0.65 (0.05, 7.82)	0.731	-	-
Others	0.12 (0.01, 1.55)	0.104	0.11 (0.01, 1.5)	0.097
Dietary Pattern				
Mixed Diet	1		1	
Pure Vegetarian	1.3 (0.25, 6.7)	0.757	0.44 (0.07, 2.85)	0.389
Vegetarian With Egg	0.35 (0.06, 2.21)	0.265	1 (0.22, 4.51)	0.995
Monthly Family Income				
20000+	1		1	
10000-19999	-	-	0.4 (0.04, 4.37)	0.452
<10000	0.9 (0.24, 3.28)	0.867	4.85 (1.14, 20.57)	0.032*

Note: p-value <0.05 Significant

Mothers employed in the agriculture sector exhibited an increased odds ratio of blood transfusion, measuring 1.1 (0.19, 6.29), with a p-value of 0.914 in the non-intervention group. Similarly, within the intervention group, mothers who consumed a pure vegetarian diet demonstrated a higher odds ratio for blood transfusion, measuring 1.3 (0.25, 6.7), with a p-value of 0.757. Table 4.7.13.

Likewise, mothers with an income of less than 10,000 rupees demonstrated a significantly higher odds ratio for blood transfusion, measuring 4.85 (1.14, 20.57), with a p-value of 0.032 in the non-intervention group, as depicted in Table 4.7.13.

CHAPTER - 5

DISCUSSION

This chapter presents the discussions and a brief outline of the study findings, conclusions, implications, and recommendations. The primary objective of this study was to assess the effectiveness of a perineal care bundle intervention, including antiseptics, to prevent infections among mothers admitted to a tertiary care hospital in India. The secondary objective was to determine the determinants of immediate adverse pregnancy outcomes among these mothers. The study revealed that Candida infection was observed solely among the non-interventional group.

5.1 Discussion

5.2 Demographic Characteristics

In this study, the majority of participating mothers fell within the age range of 20 to 25 years (67.4%). Conversely, Oleiwi et al. in Iraq 2010 observed that the majority of participating mothers in their study belonged to the 26 to 30 years age group.[111] Similarly, Rai et al. in West Bengal, 2019, found that the majority of participant mothers were between 18 to 25 years old.[136] Girotra et al. in India, 2019-2021, reported that the largest portion of participant mothers fell within the 21 to 30 years age group (71.39%).[184]Additionally, Sulaiman et al. in 2018 noted that 58% of the participating mothers were in the 20 to 24 years age group.[4] Furthermore, in our study, 78.1% of the participant mothers were Hindus. Similarly, Patel et al. in Maharashtra, India, 2021, observed that the majority of their participants were also Hindus, comprising 78.9%.[75]

In the current study, 40.1% of participating mothers had an education level equivalent to PUC. Correspondingly, Koirala et al. in Karnataka, India, 2022, also reported that above 50% of participant mothers had pre-university level education.[39] However, in contrast to our findings, Patel et al. in Maharashtra, India, 2021, noted that 36.2% of participant mothers belonged to the pre-university level education category.[136] Another study, conducted by Patel et al. similarly observed that the majority of participant mothers had pre-university level education, accounting for 23%. Regarding residence, in our study, 42.8% of the participant mothers were from rural areas. A study by Abadiga et al. in Ethiopia, 2022, aligns with our findings, reporting that 64.24% of participant mothers resided in rural areas.[75,74]

In our study, 23.7% of participant mothers were primarily housewives. This aligns with Gomaa et al. research in Egypt, 2019, which reported that 97.2% of participant mothers were housewives.[109] However, Manyeh et al. in Ghana, 2016, noted a lower percentage of participant mothers involved in farming, accounting for 17.2%.[185] Similarly, Pallepogula et al.'s 2023 study conducted in South India, our research observed similar trends. Among our participants, 70.6% were farmers, consistent with their findings. In terms of marriage, our study mirrored theirs, revealing that 84.7% of participant mothers had non-consanguineous marriages, while around 9.8% had consanguineous marriages, echoing the patterns identified in the South Indian study.[186]

Concerning income, our study indicated that the monthly family income for participant mothers was above 20,000 rupees. This contrasts with Gokhale et al. study in Pune, India, 2022, where the majority had incomes ranging from 8,000 to 10,000 rupees (40.7%).[187] Similarly, Abadiga et al. in Ethiopia, 2020, noted that the majority of participant mothers had a monthly income above 4,000 rupees.[74] In contrast, Tuntiseranee et al. study in Thailand, 1999, found that most participant mothers had incomes ranging from 5,001 to 10,000 rupees.[188]

Regarding parity, our study predominantly involved primiparous mothers. In contrast, Singh et al. study in Ranchi, India, 2022, showed that 46.2% of participant mothers were multiparous.[189] Similarly, Amanuel et al. in Egypt, 2021, found that the majority of participant mothers were multiparous (96.5%).[55] Another study by Pallepogula et al. in South India, 2023, reported that most participant mothers were multiparous (51.8%).[186] In our study, more than 92% of participant mothers had more than four antenatal care visits. However, Radovich et al., study in Telangana, India, 2019-2020, according to NFHS-5 analysis, reported nearly all women had one or more ANC visits (99.3%), with 70.5% having 4≥ ANC visits.[190]

Regarding dietary habits, in our study, participant mothers predominantly consumed a mixed vegetarian and non-vegetarian) diet. Similarly, Bellows et al. in India, 2020, observed that the majority of participant mothers were non-vegetarians in Uttar Pradesh (39.8%).[191] Smoking was observed in 9.6% of participant mothers in our study, while Tarasi et al. 2022, in Switzerland, reported 13.9% of participant mothers were smokers.[192] Comparatively, Lange et al. 2018 study estimated a lower smoking rate of 8.1% in Europe.[193] Additionally, Drake et al. in the USA, 2018, reported 7.2% of participant mothers were smokers.[194] Pasupuleti et al, 2021, found around 4.6% of pregnant mothers in India used tobacco, mainly in its smokeless form, which was predominant among those who used tobacco.[195] Regarding alcohol consumption, 5.1% of participant mothers in our study had an alcoholic habit. However, Aryal et al. in Nepal, 2016, reported around 33.3% of pregnant mothers consumed alcohol during pregnancy, particularly in hilly and cold areas.[196] Lange et al. 2017, predicted the prevalence of alcohol consumption during pregnancy among different nations, ranging from 4.8% in Cuba to 23.3% in Grenada, showcasing variations globally.[193] Similar to Mulat et al. in 2022, showed the overall prevalence of alcohol consumption during pregnancy across all four countries stood at 21.7%. Specifically, Burundi exhibited a higher prevalence at 32.4%, while Zimbabwe had a notably lower rate at 3%.[197] In this study, the episiotomy rate was above 52% in the intervention group. Conversely, Eko et al. in 2015, observed that during their study, only 8% of cases involved episiotomy and perineal tears.[198]

There was no perineal infection observed in the intervention group. Perineal care bundle intervention was done with 5% betadine with 20 ml normal saline solution, sterile gauze peace, and sterile sanitary pads. In contrast, 4.5% infection was observed in the non-intervention group (self-care verbal instruction). Similar to our study, a 1997 study at Johns Hopkins University by Taha et al. reported that cleaning the maternal birth canal with a 0.25% chlorhexidine solution before and after delivery was more effective for prevention of puerperal infection.[77] In 2023, a study by Jung et al. in China emphasized that using antiseptic agents before vaginal delivery is crucial to reduce the risk of perineal infection by lowering skin-colonized bacteria levels.[78] In our study, there was variation in incidence of Candida albicans infection among the participating mothers according to different sociodemographic conditions. Similar to our study, Rai M Poudel et al. in Nepal (2017) noted that the differences in Candida Albicans prevalence among participant mothers may result from sociodemographic factors and variations in sample culture techniques.[199] In the current study, perineal pain intensity (VAS) score and mean REEDA score mean values were significantly higher within the non-intervention group compared to the intervention group in the 20 to 24-hour duration category ($p<0.001$) and the 40 to 48-hour duration category ($P<0.001$) consistent with Mohamed et al. 2012 and El-Nagger NS in Egypt, their study found a significant reduction in pain intensity VAS scores and REEDA wound healing scores at 4, 24, and 48 hours postpartum in both groups.[27]

These results suggested that frequent perineal care bundle intervention initially promotes better wound healing and low pain intensity. In contrast to our findings, Rashidi et al. in 2012 reported that phenytoin was more effective in reducing pain and promoting better wound healing associated with episiotomy wounds compared to betadine.[199] Similarly, Parimala et al. in Chennai in 2020 found that betadine wash was more effective in reducing pain and promoting better wound healing of episiotomies among postnatal mothers compared to normal saline.[95] Additionally, in our study, the 'Intervention' group exhibited significantly lower redness and ecchymosis during the first 10 hours after episiotomy compared to the 'Non-intervention' group. This aligns with the findings of Mohamod et al. in 2012, who reported significantly lower redness and reduced pain intensity in the experimental group during the first 24 hours post-episiotomy compared to the non-intervention group.[27] Similarly, to our study, Parimala et al. in Chennai (2020) found that betadine wash resulted in a significant reduction in pain and better wound healing of episiotomies among postnatal mothers when compared to normal saline. Their pre-test mean value was 29.3, post-test mean 14.56, with ($p < 0.001$), indicating a significant positive effect.[95]

In our study, the 'Intervention' group displayed significantly lower redness (mean ± SD: 2.94 ± 0.24) compared to the 'Non-intervention' group (2.98 ± 0.15) during 6 to 10 hours post-episiotomy, with a t-value of 1.21 and a p-value of (0.014). Additionally, ecchymosis was notably lower in the 'Intervention' group (0.02 ± 0.22) compared to the 'Non-intervention' group (0.26 ± 0.57) during the same time frame, with a t-value of 1.02 and a p-value of 0.04. Similarly, Mohamod et al. in 2012 found lower redness in the experimental group 24 hours post-episiotomy (Mean ± SD: 1.10 ± 0.590) compared to the non-experimental group with a t-value of 5.353 and a p-value of <0.001 Moreover, the experimental group experienced less pain during the first 24 hours (mean pain scores 4.67 ± 0.997) compared to the non-experimental group (7.17 ± 1.298) with a p-value of <0.001. [27] Similar to Cobanoglu et al. in Turkey (2020), our study found that the Chlorhexidine Gluconate group exhibited significantly lower total wound healing REEDA scores and VAS pain scores compared to the Serum Physiological group. The systematic assessment of episiotomy wound recovery using the REEDA and VAS scales indicated that the Chlorhexidine Gluconate group had lower average scores than the other groups. This outcome may be attributed to the positive effects of Chlorhexidine Gluconate on wound healing promotion, as well as its non-cytotoxic and non-irritant effects on tissues.[200]

In the current study, the betadine wash had significantly less edema and ecchymosis during the 20 to 24-hour period compared to the self-perineal care group. Edema was notably lower (1.99 ± 0.24 vs. 2.54 ± 0.59, p = 0.011, and ecchymosis was significantly reduced (0.11 ± 0.40 vs. 0.26 ± 0.56, p < 0.001 within the 'Intervention' group, indicating overall reduced inflammation and better wound healing. In contrast, Gomaa et al. in Egypt in 2019 found that normal saline wash was more effective than betadine wash in promoting episiotomy wound healing and reducing pain intensity, as reflected by lower REEDA scale scores and VAS pain scores across various time durations.[109] Similar to our study, Louis et al. in India in 2012 reported that the majority of the participant mothers had lower REEDA and VAS scores in the experimental group than in the control group.[201]

Between 6 to 10 hours, the intervention group had slightly higher pain intensity (96.6%) compared to the non-intervention group (95.4%), but this difference was not statistically significant. In the non-intervention group, most participants reported moderate pain (47.7%) and mild pain (47.7%). Among the intervention group, the majority experienced mild pain (83.7%), with 16.3% reporting moderate pain at 20 to 24 hours. Similarly, in Francisco et al. in 2012, perineal pain was present in 86.5% at 20 hours and 82.7% at 48 hours. Most experienced mild pain (64.4% to 72.1%), followed by moderate pain (28.9% to 18.6%), which aligns with our findings.[18]

During the 40 to 48-hour period, approximately 76.4% of participants reported no pain. Notably, a higher percentage of the intervention group reported no pain (84.9%) compared to the non-intervention group (68.2%), and this difference was statistically significant (p=0.009). Additionally, REEDA scores for edema showed statistical significance (p=0.003) during 6 to 10 hours, (p=0.00) during 20 to 24 hours, and (p=0.00) during 40 to 48 hours post-episiotomy. In a somewhat similar study, Kalaivani et al. in Raipur, India (2021) found that after 48 hours of episiotomy, participant mothers showed moderate redness (30%), moderate edema (34.3%), mild ecchymosis (27.6%), moderate discharge (38.6%), and improved wound approximation (27.6%). For all REEDA parameters, the calculated t-values exceeded the p-values, indicating that sitz bath application was highly effective for episiotomy healing at a significance level of 0.05.[202]

Candida albicans infection was prevalent at 10.8% among mothers aged 20 to 25 years in our study. In contrast, Taskin et al. in Bangladesh (2011) found that puerperal infection was significantly associated with age 25> years, with most participant mothers being under 25 years old (71.4% of cases vs. 32.4% among controls).[122] Similarly, Bishaw et al. in Ethiopia (2023) observed that the majority of participant mothers fell into the 25-29 years age group (49.7%) and the 30+ years age group (22.1%). Puerperal infection was higher (9.6%) in the 30 and above 30 years age group compared to the 25-29 years age group (4.9%).[203] In a similar vein, Ali et al. in Pakistan, Karachi (2006) noted that most mothers had a mean age of 26.2±5.6 years. Puerperal infection was observed in 5.1% of mothers whose deliveries were conducted by unskilled persons, with perineal infection in the 25.9 years age group (4.6%).[204]

In our study, among participant mothers with illiteracy or primary education, the albicans candida infection rate was 16.7%. In contrast to Taskin et al. in Bangladesh (2016), a link was found between puerperal infection and the educational level of participant mothers. In their study, 62.9% of cases had below secondary level education, while 67.6% of controls had education beyond the secondary level.[122] Similarly, Bishaw et al. 2023 reported that 17.5% of puerperal infections occurred in illiterate mothers, 8.1% in those with primary-level education, and 5.6% in those with secondary-level education. These findings highlight the significant role of education as a determinant of puerperal infection.[203] In another study by Demisse et al. in Ethiopia, 2019, around 26.8% of participants had perineal infection, belonging to the secondary level of education.[10]

In our study, we found that 14.7% of mothers with candida albicans infection fell into the monthly family income range of 10,000 to 19,999. In contrast, Taskin et al. in Bangladesh (2016) reported a significant association between puerperal infection and lower socioeconomic status, where a monthly family income of less than 15,000 taka was considered low socioeconomic status.[122] Likewise, Shamshad et al. in Ayub Teaching Hospital 2010 revealed prevalence rates of puerperal vaginal infection at 1.7%. Their study indicated that mothers with lower socioeconomic status were at a higher risk for puerperal infection.[205] Moolas et al. in India, 2020, suggested that this was particularly evident in Indian culture, where poverty led to the use of old cloth instead of sanitary pads during the early postpartum period, contributing to unhygienic practices and the introduction of infections into the vagina.[206] Similar findings were reported in Tembo et al. in Zambia 2021.[207]

This study revealed a significant association ($p=0.026$) between the mothers' hemoglobin (Hb) levels and the incidence of albicans candida infection as detected in high vaginal swab culture. The infection rate was notably higher in participant mothers with severe anemia, reaching 50% in the non-intervention group. In a similar study by Melkie et al. in Ethiopia in 2021, the research also found a significant connection between anemia and puerperal infection. The likelihood of puerperal infection was 5.68 times higher among mothers with anemia compared to those without anemia.[208]

5.3. Immediate Adverse Pregnancy Outcomes

In our study, there were 38 cases of birth asphyxia, with 12% in the intervention group and 10.8% in the non-intervention group. Similarly, Bang et al. in India in 2001 observed a high incidence of severe birth asphyxia (4.6%) and a significant occurrence of mild birth asphyxia (14.2%) based on direct observation at the time of delivery, echoing our findings.[209] In our study, we observed a total of 103 cases of low birth weight, with 24.6% in the intervention group and 37.1% in the non-intervention group. There was a statistically significant difference between the groups with a p-value of 0.013. In contrast, a study conducted by Paneru et al. in Karnataka, India in 2012 reported a 27.90% incidence of low birth weight, but no statistical significance was found between low birth weight and groups.[210] The recent analysis demonstrated that approximately 18% of infants in India are born with low birth weight (LBW). Notably, the study highlighted a higher occurrence of LBW in the northern regions, encompassing states like Delhi, Punjab, Haryana, and the northern area of Uttar Pradesh conducted by Jana et al. in India from 2019 to 2021.[211] Kundu et al. in India in 2023, highlighted a significant disparity in LBW rates across India, with rural areas exhibiting higher occurrences compared to their urban counterparts (18.58% vs. 17.36%). Notably, regional analysis unveils a concentrated prevalence in the western (20.63%) and central (20.16%) rural regions. This emphasizes the nuanced geographical distribution of LBW cases, pointing toward potential regional factors influencing birth weights in these areas.[140]

In our study, we identified 123 cases of preterm birth, with 33.5% in the intervention group and 40.1% in the non-intervention group. In contrast, Raddy et al. in Telangana, India in 2022 reported a lower preterm birth rate of 10.86%.[141]

However, according to Vogel et al. in 2014, Sri Lanka (23.8%), China (22.3%), Nepal (9.7%), and India (16.2%) had the highest proportion of non-medically indicated preterm births.[212]

In our study, postpartum hemorrhage occurred in 5.7% of cases. This is consistent with findings from Geller et al. in India in 2008, where postpartum hemorrhage was observed in 9.8% of all participant mothers in their study.[168] Additionally, in 2019, Kebede et al. conducted a study in Ethiopia and reported a higher prevalence of postpartum hemorrhage, with 16.6% of participant mothers affected.[213] The incidence of blood transfusion in our study was 9%, which is consistent with the findings of Shridevi et al. in India in 2019, who reported a blood transfusion rate of 9.89% during labor.[159] This is also in line with a study conducted by Arzani et al. in Iran in 2022, where the transfusion rate was 6.2%.[214]

5.4. Association Between Immediate Adverse Pregnancy Outcomes and Outcomes of High Vaginal Swab Culture (Chi-square)

The chi-square test was used to examine associations between the outcomes of perineal care interventions (infection) and immediate adverse pregnancy outcomes. In the non-intervention group, 5.6% of mothers who gave birth with birth asphyxia also had an incidence of albicans candida infection. Similar to ours, a study by Goldenberg et al. in 2005 showed that mothers with perineal infection during pregnancy had a higher risk of birth asphyxia.[215] Participant mothers giving preterm birth had an 11.9% candida albicans infection rate. Similarly, Singh et al. in Odisha, India in 2016 reported a 20.6% candida infection rate among mothers with preterm births.[216] These results are consistent with studies by Kiss et al. in 2004, Chaim et al. in 1992, and Figueroa et al. in 2005, all indicating a higher incidence of spontaneous preterm birth in women with untreated asymptomatic candidiasis. This implies that Candida colonization is a risk factor for preterm birth.[217-219]

Candida albicans infection was observed in 11.3% of participant mothers with newborns having low birth weight in our study. This finding was supported by Rafiq et al. in 2023, who also noted a higher incidence of low birth weight associated with candida albicans infection during the perinatal period.[220] In our study, Candida albicans infection was observed in 10.1% of participant mothers who had postpartum hemorrhage. In contrast, Yi J et al. in China in 2023 found no relationship between perinatal infection and postpartum hemorrhage.[221] However, another study, as corroborated by the findings of Wormer et al. in 2022, showed an association between perinatal infections and the occurrence of postpartum hemorrhage.[59]

5.5. Logistic Regression Determinants of Immediate Adverse Pregnancy Outcomes

Differing outcomes may be attributed to varying sociodemographic factors. In our study, we observed a significantly higher odds ratio for birth asphyxia in participant mothers aged ≥36, with an OR (95% CI) of 147.67 (1.95, 196.72) and a p-value of 0.024. Our findings align with those of Abdo et al. in 2019, Ethiopia, who reported that 15.1% of participant mothers aged ≥35 had a significantly higher odds ratio for birth asphyxia.[222] In our findings, we observed that mothers residing in urban areas and primiparous mothers exhibited a higher odds ratio for birth asphyxia. Conversely, Yitayew et al. in Ethiopia in 2022 reported different findings, where mothers who delivered newborns in rural areas had a higher odds ratio for birth asphyxia. Interestingly, the effect of parity in their study aligned with our results.[223]

Our study identified several significant risk factors associated with birth asphyxia among newborns delivered by participating mothers. Specifically, those with limited education (illiterate or primary level), primiparity, urban residency, and a monthly family income between 5000 and 9999 rupees per month exhibited a heightened risk of birth asphyxia. Notably, the odds ratios for moderate anemia and mild anemia were notably elevated at 45.02 (CI: 2.45-826.96) with a p-value of 0.01 and 18.62 (CI: 2.84-122.14) with a p-value of 0.002 respectively. This underscores the substantial association between anemia and the risk of birth asphyxia, with moderate anemia presenting a particularly high risk. Similarly, urban residence mothers gave newborn birth with birth asphyxia was higher in our study. In contrast to our study, conducted by Amsalu et al. in 2023, reported that there was no significant association between anemia and birth asphyxia. However, they observed higher odds ratios for birth asphyxia in anemic mothers (42%) and mothers with chorioamnionitis (AOR = 3.26, 95% CI: 1.10, 9.61, p=0.032), and mothers who belonged to rural residences (51.8%).[124]

In our study, having fewer than four antenatal care (ANC) visits was associated with a 9.86 times increase in the risk of birth asphyxia. These findings resonate with the work of Jimma MS et al. in 2022, conducted in Ethiopia, which revealed that the risk of birth asphyxia was also higher in newborns whose mothers had no ANC visits, with an odds ratio of 4.26, compared to those whose mothers had four ANC visits. Similarly, studies supported by Tibebu et al. in 2022 reported that no antenatal care visit had a 3.72 times higher odds ratio for birth asphyxia, and Gane et al. (2013).[224-226]

In this study we observed that mothers who had a smoking habit exhibited a higher odds ratio for birth asphyxia. Nevertheless, a study by Sequí-Canet et al. in 2022 reported no statistically significant relationship between smoking mothers and the occurrence of birth asphyxia (p = 0.39).[227] Moreover, our research unveiled a significantly elevated odds ratio for birth asphyxia among mothers who consumed alcohol during pregnancy. In the intervention group, the odds ratio was 0.03 (95% CI: 0-0.68) with a p-value of 0.028, and in the non-intervention group, it stood at 0.01 (95% CI: 0-0.37) with a p-value of 0.013. Conversely, findings from a study conducted by Popova et al. in Canada in 2021 indicated no substantial increase in the odds ratio for birth asphyxia among mothers who consumed alcohol during pregnancy and at childbearing age. Their study also disclosed a prevalence of 4.3% for respiratory failure and 1.4% for respiratory distress during birth. Notably, the odds ratio was significantly higher in participant mothers who consumed alcohol during pregnancy in relation to the risk of birth asphyxia, measuring at 2.72 (95% CI: 1.52-4.07) with a p-value of 0.001.[228]

In this study, an elevated odds ratio for low birth weight was observed among participant mothers aged 36 and above (4.56, 95% CI: 0.32-65.43). In the non-intervention group, we found higher odds ratios for low birth weight among participant mothers with secondary level education (1.69, 95% CI: 0.42-6.78) and those residing in semi-urban areas (1.44, 95% CI: 0.51-4.07), although these were not statistically significant (p=0.457 and p=0.49 respectively). Conversely, in the non-intervention group, a monthly family income of less than 5000 was significantly associated with a higher odds ratio for low birth weight (3.44, 95% CI: 1.05-11.29, p=0.042). Partially corroborating our findings, Taywade et al. (2017) reported higher odds ratios for low birth weight among mothers aged over 20 years (20.8%), rural residents (69.4%), those with below secondary level education (21.2%), working mothers (25.7%), and tobacco-consuming mothers (9.1%). Similarly, Girotra et al. (2023) in India found increased odds ratios for low birth weight among mothers aged over 20 years (17.5%), primary and illiterate mothers (20.21%), urban residents (17.72%), those with anemia (21.35%), belonging to the poorest socioeconomic status (18.43%), with low ANC visits, smoking, and tobacco consumption (17.19%). Additionally, Scaria et al. (2022) in India also reported similar findings. These collective observations underscore the multifaceted nature of risk factors associated with low birth weight across diverse studies.[229,184]

The research conducted by Scaria et al. (2022), Kedar et al. (2014), Mishra et al. (2021), and Ghose et al.(2023) unveiled a nexus between low birth weight and several determinants: rural habitation, maternal occupation as a housewife, educational attainment below the secondary level, and a low to medium socioeconomic status. In our study, a meticulous examination of these determinants corroborates their profound implications on the occurrence of low birth weight. Notably, our findings reveal a noteworthy elevation in the odds of low birth weight, particularly when the monthly family income falls below 5000. This aligns with previous research emphasizing the link between socioeconomic status and low birth weight.[231-233]

Moreover, within our intervention group, we observed a notable increase in the odds ratio for low birth weight among mothers with moderate anemia (5.01, 95% CI: 0.87-28.99, p=0.072). This aligns with studies by Sah et al. in Nepal (2022), Figueiredo et al. in Brazil (2018), Lamichhane et al. in Nepal (2019), and Pal et al. in Bengal, India (2020), consistently highlighting the heightened risk of low birth weight among mothers with anemia during pregnancy. Collectively, these studies affirm the association between diminished hemoglobin levels and increased risk of low birth weight.[234-237]

Within the non-intervention group, we discerned a noteworthy relationship between maternal smoking habits during pregnancy, yielding an odds ratio of 0.37 (95% CI: 0.07, 2.06), and alcohol habits of 0.63 (95% CI: 0.05, 7.72) for low birth weight. This result resonates with the insights gleaned from the research conducted Fifer et al. 2009 and Hartel et al. in South Africa in (2022). Their study, like ours, underscores that women who engage in alcohol and smoking habits during pregnancy confront an elevated risk of delivering low birth weight infants when compared to mothers who abstain from these behaviors.[238-239]

In the intervention group, mothers aged between 26 and 30 years exhibited a notably significant increase in the odds ratio for preterm birth, measuring at 3.76 (95% CI: 1.12, 12.67), with a p-value of 0.033. Conversely, our findings align with those of Fuchs F et al. in Canada in 2018, who observed a significantly higher incidence of preterm birth among mothers younger than 24 years and older than 35 years when compared to the reference group of 24 to 30 years. Furthermore, our study revealed that mothers with a secondary education level displayed an increased odds ratio for preterm birth, measuring 2.54 (95% CI: 0.59, 10.88) within the intervention group, while mothers with illiterate and primary level education had a higher odds ratio for preterm birth, 1.14 (95% CI: 0.15, 8.57), in the non-intervention group. Matching with our findings, Gurung A et al. in Nepal in 2020 found higher odds ratios among low birth weight mothers who were illiterate (OR 1.41; 1.22–1.64). Similarly, Ghelichkhani S et al. in Iran in 2019, and Delnord et al. in France in

2018 concluded that low-level education was significantly associated with a higher risk ratio (1.3 to 2.1 times higher) for preterm birth. Shah et al. in Bangladesh in 2014 reported a higher prevalence of preterm birth among mothers with education below the primary level.[240-244]

Remarkably, within the intervention group, mothers with an income ranging from 5000 to 9999 rupees exhibited a notably heightened odds ratio for preterm birth, measuring at 5.38 (95% CI: 1.07, 27.16), with a p-value of 0.042. This finding mirrors the results of Devi et al. in Manipur, India, in 2023, who also found a significant association between socioeconomic status and preterm birth. Their study demonstrated that mothers with a monthly family income of less than 10,000 rupees were significantly more prevalent in the preterm birth group compared to the term birth group (41.37% vs. 20.61%, p = 0.024). Low-income mothers were 2.7 times more likely to experience preterm birth mothers earning less than 10,000 rupees per month.[143]

In our study mothers with moderate anemia demonstrated an increased odds ratio for preterm birth, measuring at 1.91 (95% CI: 0.39, 937) with a p-value of 0.425 in the intervention group and 2.36 (95% CI: 0.51, 10.8) with a p-value of 0.27 in the non-intervention group. Consistent with our findings, studies by Rahmati et al. in 2020 revealed a noteworthy association between maternal anemia during pregnancy and premature birth, showing a 1.56-fold increase in risk with a 95% confidence interval (1.25–1.95). Rani et al. in India (2014) found that 50% of mothers who experienced preterm birth had severe anemia, while 22% of mothers with preterm births had mild to moderate anemia. Additionally, Rahman et al. in Asian countries (2020) reported an odds ratio 1.96 times higher for preterm birth among anemic mothers compared to non-anemic counterparts, with a p-value of 0.04. In a study by Bone in Karnataka, India, 2022, it was demonstrated that the severity of anemia posed a higher risk for preterm birth in mothers with more severe anemia compared to those with normal hemoglobin levels during pregnancy in Karnataka.[245,246, 125,247]

In the non-intervention group, it's noteworthy that participant mothers residing in urban areas exhibited a significantly higher odds ratio for preterm birth. In contrast to our current study, research by Soltani et al. in Iran in 2019 identified a significant increase in the odds ratio for preterm birth associated with mothers from urban residences. Another study conducted by Alamneh et al. in sub-Saharan Africa in 2021 found the odds ratio to be 1.21 times significantly higher in mothers who resided in rural areas for preterm birth.[248-249]

Our study highlighted a notable contrast in the odds of preterm birth among different occupational groups within the non-intervention groups. Specifically, private service holders and individuals falling under the 'Others' category (including hard labor workers, construction laborers, and those engaged in business activities) showed significantly lower odds ratios for preterm birth when compared to government service holders. These odds ratios were reported as [0.2 (95% CI: 0.06, 0.6)] with a p-value of 0.005 and [0.32 (95% CI: 0.11, 0.9)] with a p-value of 0.013 in the non-intervention group. Similar findings were reported in a study conducted by Devi et al. in Manipur, India in 2023, which showed that the odds ratio was 4.46 times higher in mothers who were full-time workers with a p-value of 0.012.86. Our study also observed that having fewer than four antenatal visits was associated with a notably higher odds ratio for preterm birth in the non-intervention group, measuring 2.59 (95% CI: 0.57, 11.8) with a p-value of 0.218. However, a study conducted by

Baldewsingh et al. in 2020 observed that mothers with fewer than eight ANC visits had a 5.49 times higher risk for preterm birth than mothers who did more than eight ANC visits, with a p-value of <0.00.[143, 250]

Additionally, Jana A et al in India, 2023 reported that mothers who didn't attend any antenatal visits experienced a 13% rate of preterm births.[134] Pervin et al. in Bangladesh in 2020 found that the likelihood of preterm birth was 2.4 times greater (with an odds ratio of 2.37 and a 95% confidence interval of 2.07 to 2.70) for women who had fewer than or equal to one antenatal care visit compared to those who had three or more visits.[251]

In our study, it was observed that mothers who consumed alcohol in the intervention group demonstrated higher odds ratios for preterm birth, measuring 10.42 (95% CI: 0.06, 3.01), with a p-value of 0.387, although this association did not reach statistical significance. Similar findings were observed in a study conducted by Ikehara S et al. in Japan in 2019, where engaging in heavy alcohol consumption (≥300 g ethanol/week) during the second and third trimesters was linked to a four-fold increase in risk compared to abstaining from alcohol (multivariable odds ratio of 4.52; 95% confidence interval 1.68-12.2).[252] Similarly, Doke et al in India in 2021 reported a higher prevalence of preterm birth in mothers who consumed alcohol during pregnancy compared to mothers who didn’t consume alcohol during pregnancy.[40]Conclusively, our study identified several determinants of preterm birth, including maternal age, educational level, occupation, parity, monthly family income, place of residence, frequency of antenatal care visits, dietary patterns, anemia status, and alcohol consumption during pregnancy. Our findings align with those of

Mekuriyaw et al. in Northern Ethiopia (2020), Mitku et al. (2020), Ikehara et al. in Japan (2019), and Mohapatra et al. in India (2022). [252-255]

In our study, mothers aged 36 years and older demonstrated a higher odds ratio for postpartum hemorrhage, measuring 3.27 (95% CI: 0.14, 77.73), with a p-value of 0.463 in the non-intervention group. This differs from the findings of Pubu et al. in China (2021), who reported that maternal age 35 and above was significantly associated with a higher odds ratio for postpartum hemorrhage, measuring 1.18–3.27 with a p-value of 0.01.[256] Additionally, Uthpala et al. in 2022 identified the age bracket of 20-24 as a notable risk factor for postpartum hemorrhage.[257] In our study, mothers who reported a smoking habit within both the intervention and non-intervention groups showed elevated odds ratios for postpartum hemorrhage, although this association did not reach statistical significance. In contrast to our findings, Feferkorn in Bangladesh (2021) reported a significantly higher odds ratio for postpartum hemorrhage in mothers who smoked during pregnancy (odds ratio [0.94, 95% CI: 0.9–0.98]).[258]

Regarding monthly family income exceeding 10,000-19,999 rupees, our study showed an increased odds ratio for postpartum hemorrhage, measuring 1.33 (95% CI: 0.18, 10.03), with a p-value of 0.784 within the intervention group. These findings are consistent with those of Tondge et al. in India in 2018, indicating that poor economic status represented a risk for the development of postpartum hemorrhage.[165]

Furthermore, in our study, mothers with an illiterate or primary level of education exhibited a notably higher odds ratio for postpartum hemorrhage, measuring 12.53 (95% CI: 0.25, 619.74), with a p-value of 0.204 in the non-intervention group. These findings align with similar studies by Muluye et al. in Ethiopia in 2023, Ujjiga et al. in South Sudan in 2014, and Obossou et al. at Parku Medical University in 2015, where restricted maternal educational backgrounds were identified as contributing factors to postpartum hemorrhage.[259-261]

In our study, multiparity was associated with an elevated odds ratio for postpartum hemorrhage, measuring 1.25 (95% CI: 0.32, 4.86), with a p-value of 0.749. Amanuel et al. in 2021 also observed that multiparous mothers had a higher odds ratio for postpartum hemorrhage.[55] Moreover, in our study, urban residing women displayed an increased odds ratio for postpartum hemorrhage in both groups, measuring 0.25 (95% CI: 0.1, 0.64) with a p-value of 0.004. However, Obossou et al. at Parku Medical University in 2015 found that mothers residing in rural areas had a higher odds ratio for postpartum hemorrhage.[261] Partially matching our study, Amjad et al. and in Canada in 2019, and Choe et al 2002to 2016, Korea indicated that mothers residing in rural, low socioeconomic status areas had the highest odds for adverse postpartum hemorrhage.[262-263]

In our study, 9% of cases required blood transfusion. Among mothers aged 36 years and above within the intervention group, there was a notably significant increase in the odds ratio for blood transfusion during labor, measuring 28.65 (95% CI: 1.07, 768.31), with a p-value of 0.046. This finding partially aligns with the studies conducted by Xie et al. (2021) and Wang et al. (2022) in China, both revealing a significantly higher odds ratio for blood transfusion during labor and early postpartum associated with maternal age. Their study indicated an odds ratio of 1.087 (95% CI: 1.016–1.166) with a p-value of 0.017, where the mean maternal age was 33.03 years, and mothers faced issues with postpartum hemorrhage (PPH).

Conversely, Shridevi et al. in 2019 reported that although the majority of mothers fell within the 21-30 years age group (70.16%), it didn't significantly correlate with a higher risk for blood transfusion, similar to our study's blood transfusion incidence of 9.89%. Notably, they found that most blood transfusions occurred in multiparous mothers, consistent with our study's observations. [264,265,159]

In our study, blood transfusion was 4.85 times higher in mothers with lower economic status (p-value >0.001). This aligns with the findings of Walraven et al. in Kenya (2008), indicating higher obstetric blood transfusion rates in mothers with low socioeconomic status and poor birth settings.[266] Similarly, a study by Song et al. in South Korea (2023) revealed a heightened risk of postpartum hemorrhage in households with low-income levels, highlighting disparities across income brackets. [267]

Mothers pursuing pre-university courses in our study exhibited an increased likelihood of requiring a blood transfusion, measuring 2.95 (95% CI: 0.25, 34.35), within the intervention group. In contrast, Xie et al. in 2021 observed that mothers with a lower level of education faced similar risks. Furthermore, our study indicated that advanced maternal age was associated with a higher risk of blood transfusion, consistent with our findings. Additionally, in the non-intervention group of our study, mothers with occupations in agriculture showed a heightened odds ratio. Similar to Wang et al. in China in 2022 reported a significant association between maternal age and increased odds ratio for blood transfusion during labor and early postpartum (OR = 1.087, 95% CI: 1.016–1.166, p-value 0.017) supported by their univariate analysis results.[264,265]

The present study significantly contributes to the existing literature on this subject. It suggests that providing systematic and structured information empowers patients by offering accurate and adequate data, potentially reducing perineal pain, improving wound healing, and enhancing outcomes related to perineal infection**.**

CHAPTER - 6

SUMMARY

The current study was undertaken by the investigator to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes among mothers admitted in a tertiary care hospital, Belagavi, Karnataka, India.

Objectives of the Study

Primary Objectives: To assess the effectiveness of perineal care bundle (with an antiseptic solution and the use of sterile pads intervention) to prevent infection among mothers admitted to a tertiary care hospital in Belgaum, Karnataka, India.

Secondary Objective: To identify the determinants of immediate adverse pregnancy outcomes among the mothers admitted to the same hospital.

Research Hypothesis

An evaluative research approach was used in this study to evaluate the effectiveness of perineal care bundle intervention and immediate adverse pregnancy outcomes among mothers admitted to labour and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka.

The study included 334 participants undergoing vaginal delivery at Dr. Prabhakar Kore Hospital, Belagavi. Among them, 167 received a detailed perineal care bundle involving 5% betadine, normal saline, sterile gauze, and regular sterile pad changes. This care was provided every 2 hours before delivery and every 4 hours after delivery until discharge. The non-intervention group participants received self-perineal care instructions. High vaginal swab cultures were conducted before and 72 hours after delivery.

Data analysis utilized SPSS, employing chi-square tests for high vaginal swab culture outcomes, independent 't' tests for wound healing and pain intensity, and mean, median, and chi-square tests for demographic characteristics. Logistic regression was used to explore outcome-related determinants.

Demographic Characteristics of Subjects

1. The majority of subjects in both the intervention and non-intervention groups belonged to the age group of 20-25 years.
2. The majority of subjects in the intervention group (45.5%) and non-intervention group (40.1%) resided in rural areas.
3. The highest percentage of subjects in the intervention group had completed a pre-university course (40.1%), while in the non-intervention group, the highest percentage of educated mothers had either a bachelor's or pre-university level education (30.5%).
4. In the intervention group, 26.3% of mothers were involved in agricultural occupations, whereas in the non-intervention group, this percentage was 19.2%.
5. Mothers with a monthly family income of less than 5000 rupees showed a higher odds ratio for low birth weight, measuring 2.19 (0.55, 8.7), within the intervention

Major Findings of the Study

Determinants of Immediate Adverse Pregnancy Outcomes

1. High vaginal swabs culture report pre-delivery showed no growth, but 72 hours post-delivery, 9.6% of non-intervention group mothers exhibited Candida albicans. A strong statistical link ($\chi 2 = 16.81$, df=1, $p < 0.001$) underscores the association between lack of intervention and postpartum fungal presence.
2. The 'Intervention' group exhibited significantly better episiotomy wound healing compared to the 'Non-intervention' group at multiple time intervals: 6-10 hours (p=0.006, t=6.88), 20-24 hours (p=0.067, t=4.66), and notably superior at 40-48 hours (p<0.001, t=3.97).
3. The Intervention Group showed non-significant differences in pain intensity compared to the Non-intervention Group at 6-10 hours (t=0.85, p=0.091). However, at 20-24 hours and 40-48 hours, the Intervention Group reported significantly lower pain intensity levels compared to the Non-intervention Group (t=5.12, p<0.001 and t=2.88, p<0.001 respectively)
4. The study highlights the significant effectiveness of the perineal care bundle intervention, incorporating antiseptic solutions and sterile pads, in notably reducing perineal infections during puerperal care. These compelling findings underscore the usefulness and potential impact of this intervention in clinical practice.
5. The study concluded that maternal age, religion, place of residence, occupation, monthly family income, type of marriage, frequency of antenatal care visits, smoking, and alcohol habits influence the immediate adverse pregnancy outcomes. Recognizing the impact of these factors is crucial for providing tailored and effective nursing care services.

CHAPTER - 7

CONCLUSIONS

6.1 Conclusion and suggestions

The implementation of a perineal care bundle intervention involving antiseptic solutions and regular changes of sterile pads demonstrated positive effects on postnatal mothers' episiotomy wound healing. This was evidenced by lower REEDA scale scores, reduced pain levels assessed via VAS, and the absence of growth in high vaginal swab cultures.

However, the establishment of a standardized perineal care protocol, including regular changes of pads for mothers, remains an unmet need in healthcare facilities. As an alternative to prevent infections, considering the use of 5% betadine (20 ml normal saline and 5 ml betadine) could be beneficial.

It's imperative to acknowledge that various factors, including age, monthly family income, occupation, dietary patterns, residence, type of marriage, and frequency of antenatal care visits, may significantly impact immediate adverse pregnancy outcomes. Emphasizing consideration of these factors is essential in delivering effective healthcare services

Effectiveness of Perineal Care Intervention in the Study

- In the intervention group, there was no organism growth observed in the perineal area.
- Reduced post-episiotomy pain was evident.
- Facilitated early post-episiotomy recovery.

- No significant difference was noted in the length of post-episiotomy hospital stay or post-episiotomy complications.

6.2. Implications for Nursing Practice

Nursing Practice

- **Proactive Perineal Care:** Nurses should proactively administer perineal care interventions within 72 hours post-delivery in clinical practice.
- **Essential Measures for Care:** Utilizing a 5% betadine solution in combination with normal saline and changing sterile pads as necessary should be deemed essential measures. These interventions aim to alleviate discomfort, enhance comfort, and mitigate the risk of infections.
- **Incorporation into Standard Procedures:** Nurses ought to integrate these practices into standard procedures, not only within hospital settings but also in community health centers and primary healthcare facilities.

Nursing Research

- **Role of Nursing Research:** Nursing research plays a pivotal role in investigating the effectiveness of perineal care bundle interventions, incorporating antiseptic solutions and timely replacement of sterile pads for laboring mothers pre- and post-delivery. Future research endeavors hold the potential to contribute to the development of a comprehensive and standardized perineal care protocol.
- **Understanding Adverse Pregnancy Outcomes**: Furthermore, delving deeper into the factors influencing immediate adverse pregnancy outcomes is imperative. Such exploration can yield valuable insights for mitigating

associated risks, thereby elevating the quality of care for both mothers and newborns.

Nursing Administration

- **Training Programs for Nurses:** Nurse administrators should implement in-service training programs focusing on the importance of perineal care interventions using a combination of 5% betadine and normal saline and apply sterile pads. These initiatives will empower nurses with the requisite knowledge and skills for delivering top-tier patient care.
- **Standardized Guidelines Implementation:** Incorporating standardized guidelines within nursing services is crucial. These guidelines not only prevent potential complications but also ensure comprehensive patient well-being. They serve as invaluable tools, enabling consistent and high-quality care delivery while prioritizing patient safety and health.

Nursing Education

- **Nursing Role**: Nurses have a vital role in offering comfort, particularly to laboring patients.
- **Curriculum Emphasis**: The nursing curriculum should prioritize developing advanced knowledge and skills in perineal care, including the changing of sterile pads, and mirroring practices in various healthcare settings.
- **Curriculum Integration**: The study recommends integrating methods of perineal care bundles into the nursing curriculum.
- **Continued Education:** In-service education programs and workshops are essential for educating nursing staff on perineal care bundle methods, enabling skill enhancement.

- **Understanding Pregnancy Complications:** Teaching factors linked to adverse pregnancy outcomes is imperative for improving overall outcomes.
- **Promoting Evidence-Based Practice:** Encouraging nursing students to effectively apply research-based practices in clinical settings is crucial.

CHAPTER -8

RECOMMENDATIONS AND LIMITATIONS

8.1 Recommendations

- **Explore Alternative Methods:** Conduct a similar study using alternative methods of perineal care, such as chlorhexidine.
- **Study Post-Cesarean Section Mothers:** Conduct a similar study focusing on other mothers who have undergone cesarean sections.
- **Multicentric Investigation:** A multicentric study might offer a better understanding of perineal care.
- **Compare Delivery Methods:** Conduct a comparative study between normal vaginal delivery and cesarean section procedures.
- **Compare Treatment Efficacy:** Conduct a comparative study between 5% betadine wash and sitz bath for assessing episiotomy wound healing and pain intensity.

8.2 Limitations

- **Single-Centric Study:** The study's single-centric nature might restrict the generalization of results to the broader population.
- **Limited Evaluation of Methods:** The study has evaluated only a few alternative methods and techniques of perineal care, potentially limiting the scope of the findings.
- **Small Sample Size:** The small sample size limits both generalizability and statistical power, emphasizing the need for larger, more diverse samples in future research to enhance validity and reliability.

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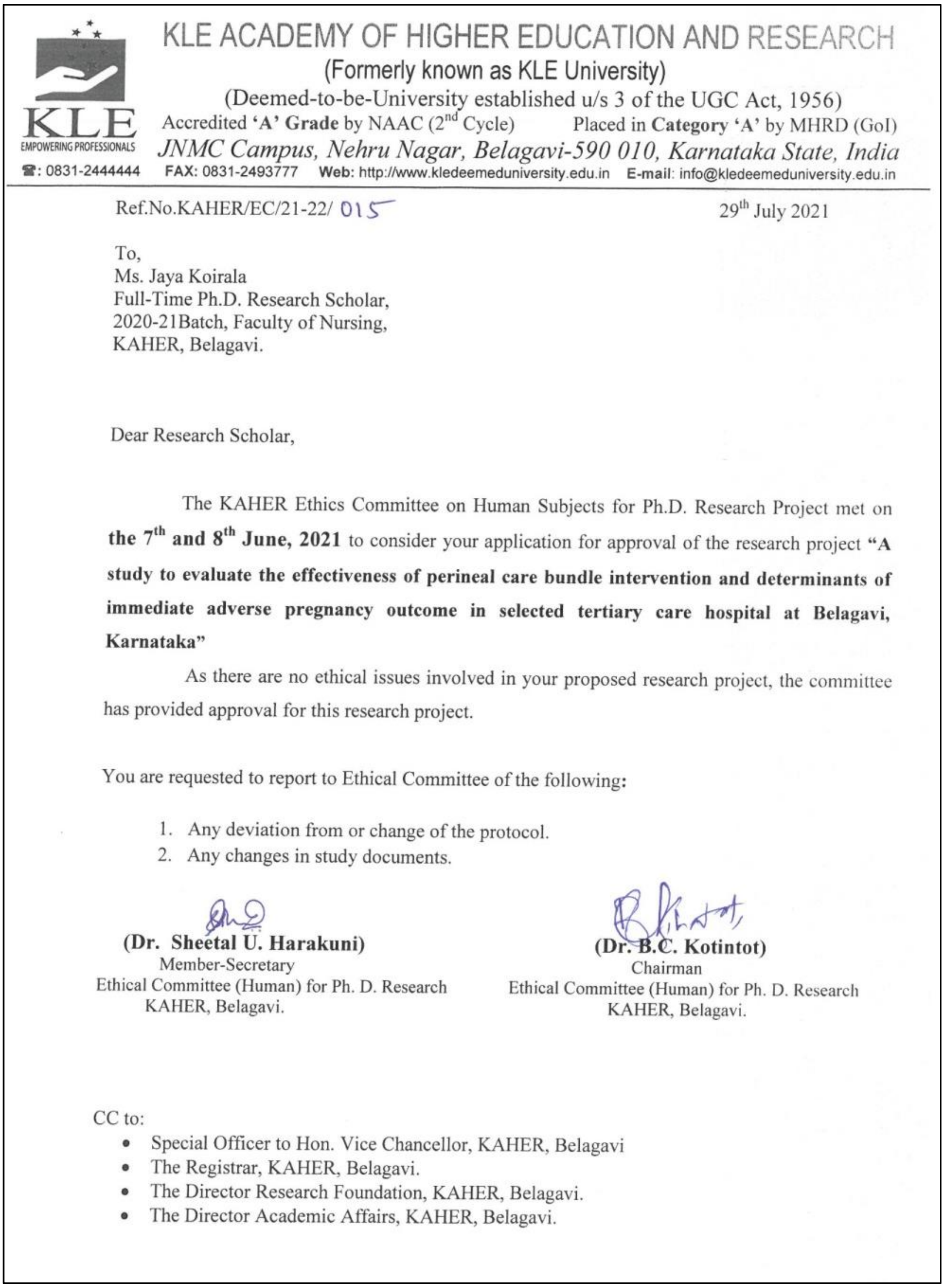
ANNEXURES

ANNEXURE- I

ETHICAL CLEARANCE LETTER



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JNMC Campus, Nehru Nagar, Belagavi-590 010, Karnataka State, India
☎: 0831-2444444 **FAX:** 0831-2493777 **Web:** http://www.kledeemeduniversity.edu.in **E-mail:** info@kledeemeduniversity.edu.in

Ref.No.KAHER/EC/21-22/ 015 29th July 2021

To,
Ms. Jaya Koirala
Full-Time Ph.D. Research Scholar,
2020-21Batch, Faculty of Nursing,
KAHER, Belagavi.

Dear Research Scholar,

The KAHER Ethics Committee on Human Subjects for Ph.D. Research Project met on **the 7th and 8th June, 2021** to consider your application for approval of the research project **"A study to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcome in selected tertiary care hospital at Belagavi, Karnataka"**

As there are no ethical issues involved in your proposed research project, the committee has provided approval for this research project.

You are requested to report to Ethical Committee of the following:

1. Any deviation from or change of the protocol.
2. Any changes in study documents.

(Dr. Sheetal U. Harakuni)
Member-Secretary
Ethical Committee (Human) for Ph. D. Research
KAHER, Belagavi.

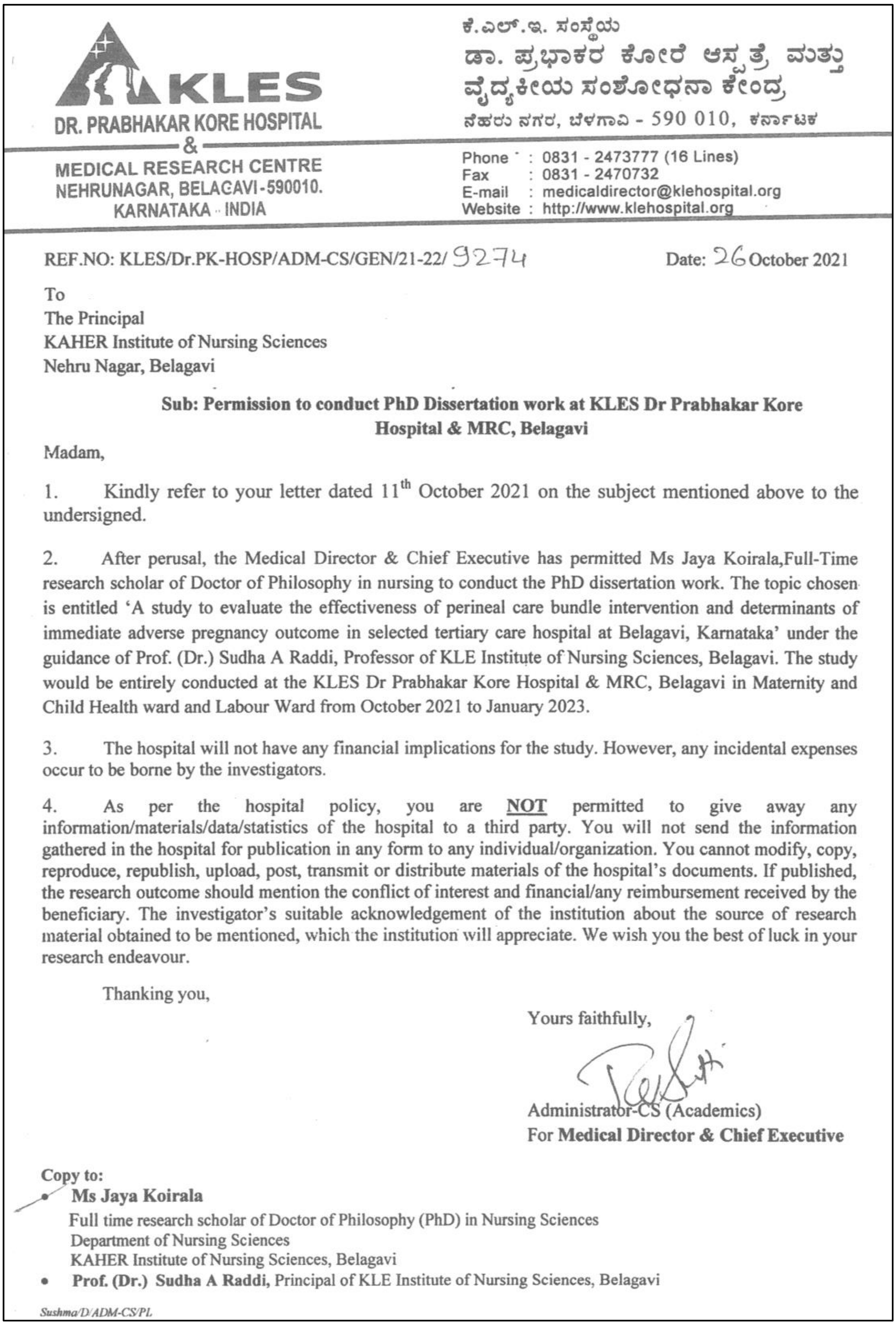
(Dr. B.C. Kotintot)
Chairman
Ethical Committee (Human) for Ph. D. Research
KAHER, Belagavi.

CC to:

- Special Officer to Hon. Vice Chancellor, KAHER, Belagavi
- The Registrar, KAHER, Belagavi.
- The Director Research Foundation, KAHER, Belagavi.
- The Director Academic Affairs, KAHER, Belagavi.

ANNEXURE- II

PERMISSION LETTERFROM HOSPITAL AUTHORITY



KLES
DR. PRABHAKAR KORE HOSPITAL
&
MEDICAL RESEARCH CENTRE
NEHRUNAGAR, BELAGAVI-590010.
KARNATAKA - INDIA

ಕೆ.ಎಲ್.ಇ. ಸಂಸ್ಥೆಯ
ಡಾ. ಪ್ರಭಾಕರ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು
ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರ
ನೆಹರು ನಗರ, ಬೆಳಗಾವಿ - 590 010, ಕರ್ನಾಟಕ

Phone : 0831 - 2473777 (16 Lines)
Fax : 0831 - 2470732
E-mail : medicaldirector@klehospital.org
Website : http://www.klehospital.org

REF.NO: KLES/Dr.PK-HOSP/ADM-CS/GEN/21-22/ 9274 Date: 26 October 2021

To
The Principal
KAHER Institute of Nursing Sciences
Nehru Nagar, Belagavi

Sub: Permission to conduct PhD Dissertation work at KLES Dr Prabhakar Kore Hospital & MRC, Belagavi

Madam,

1. Kindly refer to your letter dated 11th October 2021 on the subject mentioned above to the undersigned.

2. After perusal, the Medical Director & Chief Executive has permitted Ms Jaya Koirala,Full-Time research scholar of Doctor of Philosophy in nursing to conduct the PhD dissertation work. The topic chosen is entitled 'A study to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcome in selected tertiary care hospital at Belagavi, Karnataka' under the guidance of Prof. (Dr.) Sudha A Raddi, Professor of KLE Institute of Nursing Sciences, Belagavi. The study would be entirely conducted at the KLES Dr Prabhakar Kore Hospital & MRC, Belagavi in Maternity and Child Health ward and Labour Ward from October 2021 to January 2023.

3. The hospital will not have any financial implications for the study. However, any incidental expenses occur to be borne by the investigators.

4. As per the hospital policy, you are **NOT** permitted to give away any information/materials/data/statistics of the hospital to a third party. You will not send the information gathered in the hospital for publication in any form to any individual/organization. You cannot modify, copy, reproduce, republish, upload, post, transmit or distribute materials of the hospital's documents. If published, the research outcome should mention the conflict of interest and financial/any reimbursement received by the beneficiary. The investigator's suitable acknowledgement of the institution about the source of research material obtained to be mentioned, which the institution will appreciate. We wish you the best of luck in your research endeavour.

Thanking you,

Yours faithfully,

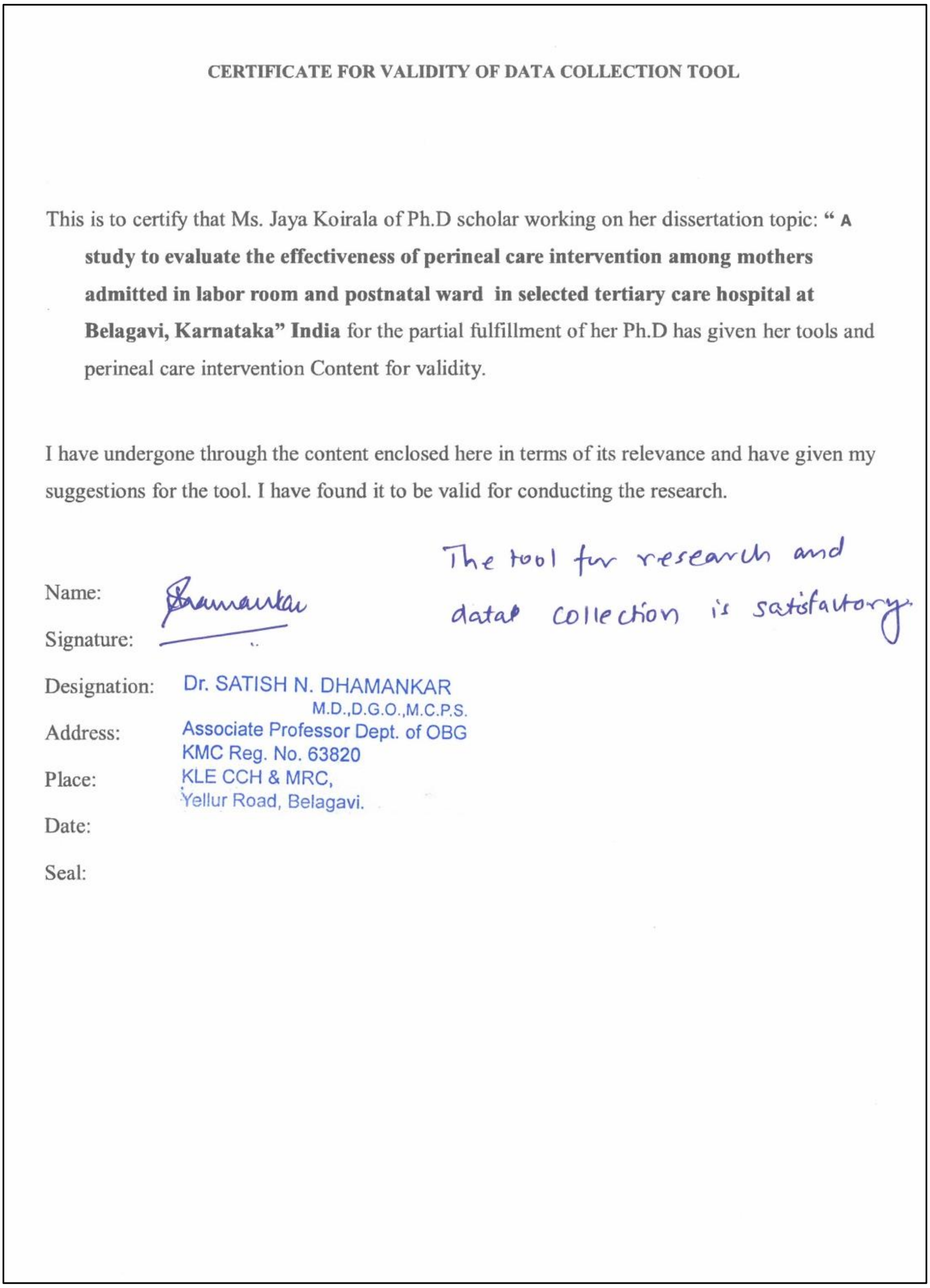
Administrator-CS (Academics)
For **Medical Director & Chief Executive**

Copy to:

- **Ms Jaya Koirala**
  Full time research scholar of Doctor of Philosophy (PhD) in Nursing Sciences
  Department of Nursing Sciences
  KAHER Institute of Nursing Sciences, Belagavi
- **Prof. (Dr.) Sudha A Raddi,** Principal of KLE Institute of Nursing Sciences, Belagavi

Sushma/D/ADM-CS/PL

ANNEXURE -III



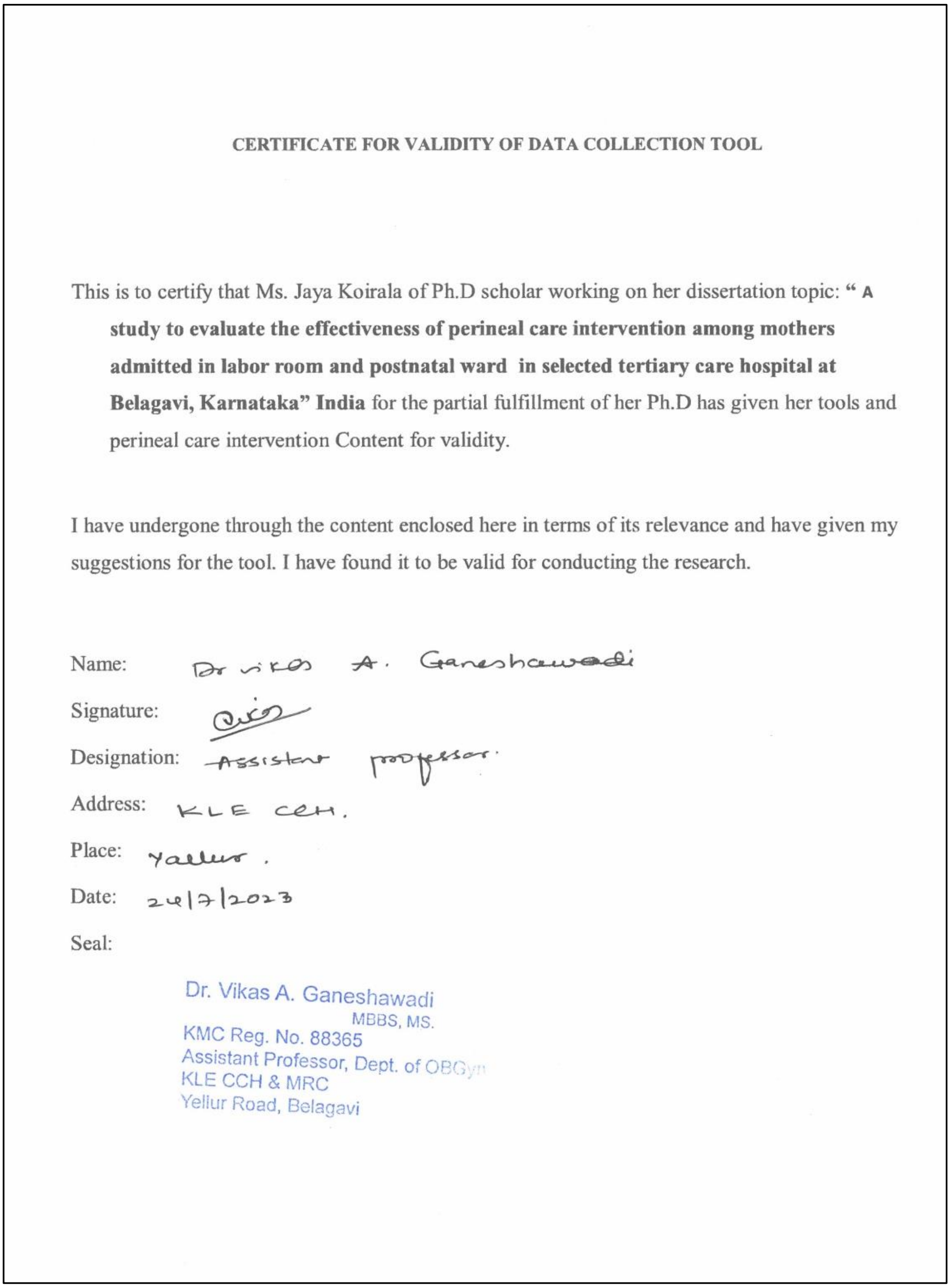
CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

This is to certify that Ms. Jaya Koirala of Ph.D scholar working on her dissertation topic: **" A study to evaluate the effectiveness of perineal care intervention among mothers admitted in labor room and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka" India** for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have undergone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

The tool for research and data collection is satisfactory.

Name: Dhamankar
Signature:
Designation: Dr. SATISH N. DHAMANKAR
M.D.,D.G.O.,M.C.P.S.
Address: Associate Professor Dept. of OBG
KMC Reg. No. 63820
Place: KLE CCH & MRC,
Yellur Road, Belagavi.
Date:
Seal:



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I have undergone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Name: Dr vikas A. Ganeshawadi

Signature:

Designation: Assistant professor.

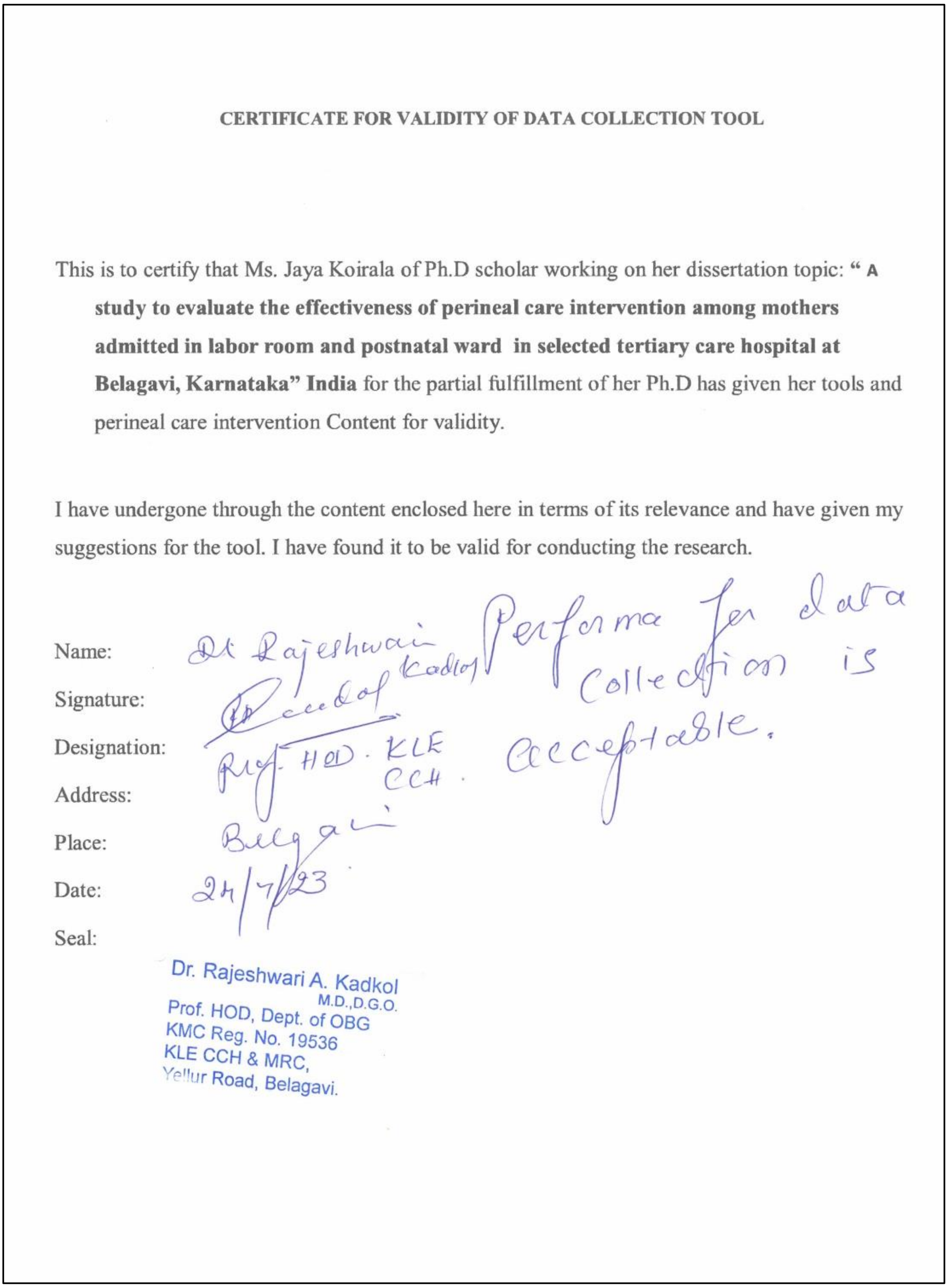
Address: KLE CCH.

Place: yallur.

Date: 24/7/2023

Seal:

Dr. Vikas A. Ganeshawadi
MBBS, MS.
KMC Reg. No. 88365
Assistant Professor, Dept. of OBGyn
KLE CCH & MRC
Yellur Road, Belagavi



CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

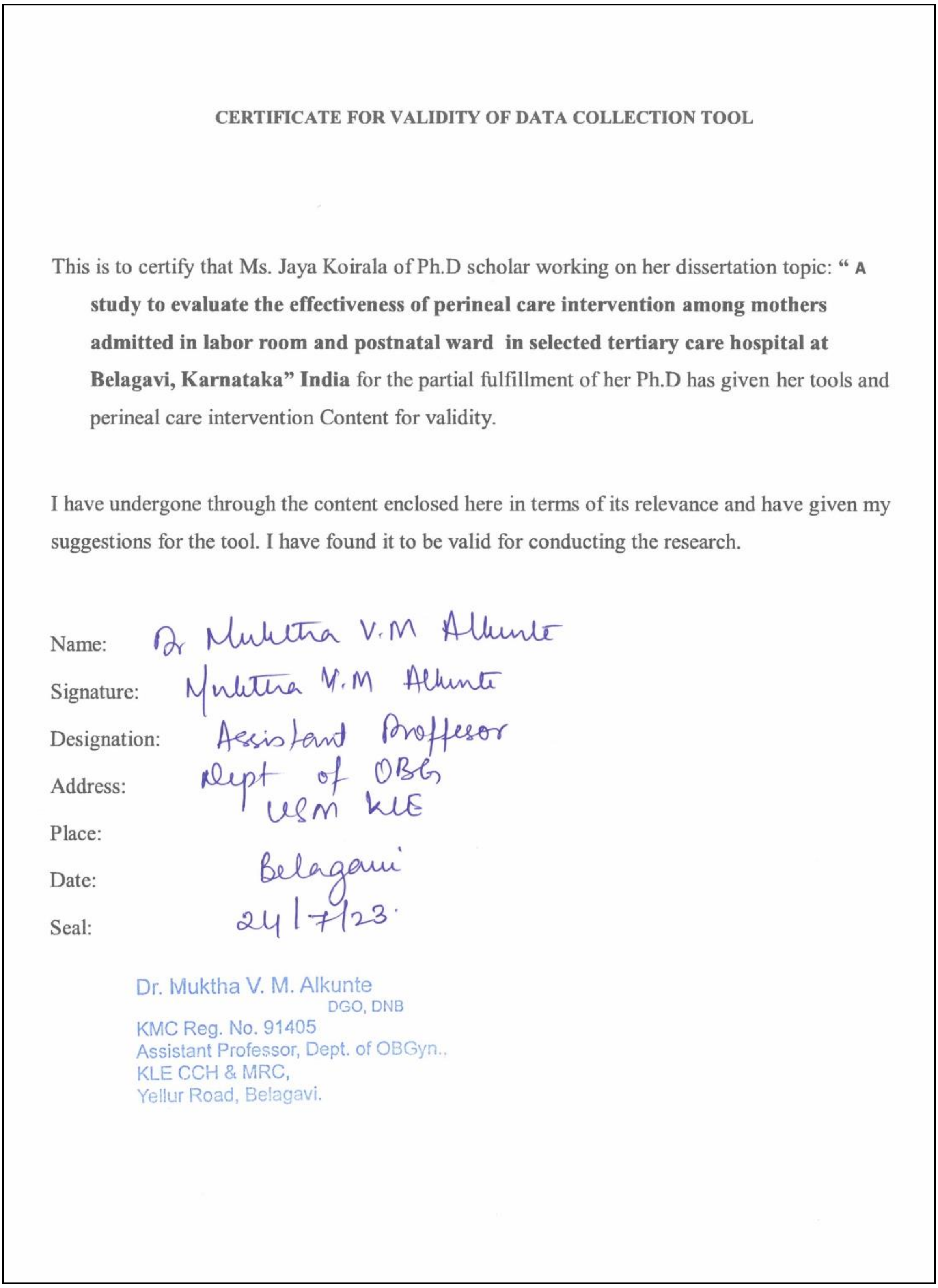
This is to certify that Ms. Jaya Koirala of Ph.D scholar working on her dissertation topic: **" A study to evaluate the effectiveness of perineal care intervention among mothers admitted in labor room and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka" India** for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have undergone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Performa for data collection is acceptable.

Name: Dr Rajeshwari Kadkol
Signature: Kadkol
Designation: Prof. HOD. KLE CCH.
Address:
Place: Belgavi
Date: 24/7/23
Seal:

Dr. Rajeshwari A. Kadkol
M.D.,D.G.O.
Prof. HOD, Dept. of OBG
KMC Reg. No. 19536
KLE CCH & MRC,
Yellur Road, Belagavi.



CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

This is to certify that Ms. Jaya Koirala of Ph.D scholar working on her dissertation topic: " **A study to evaluate the effectiveness of perineal care intervention among mothers admitted in labor room and postnatal ward in selected tertiary care hospital at Belagavi, Karnataka" India** for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have undergone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Name: Dr Muktha V.M Alkunte

Signature: Muktha V.M Alkunte

Designation: Assistant Proffesor

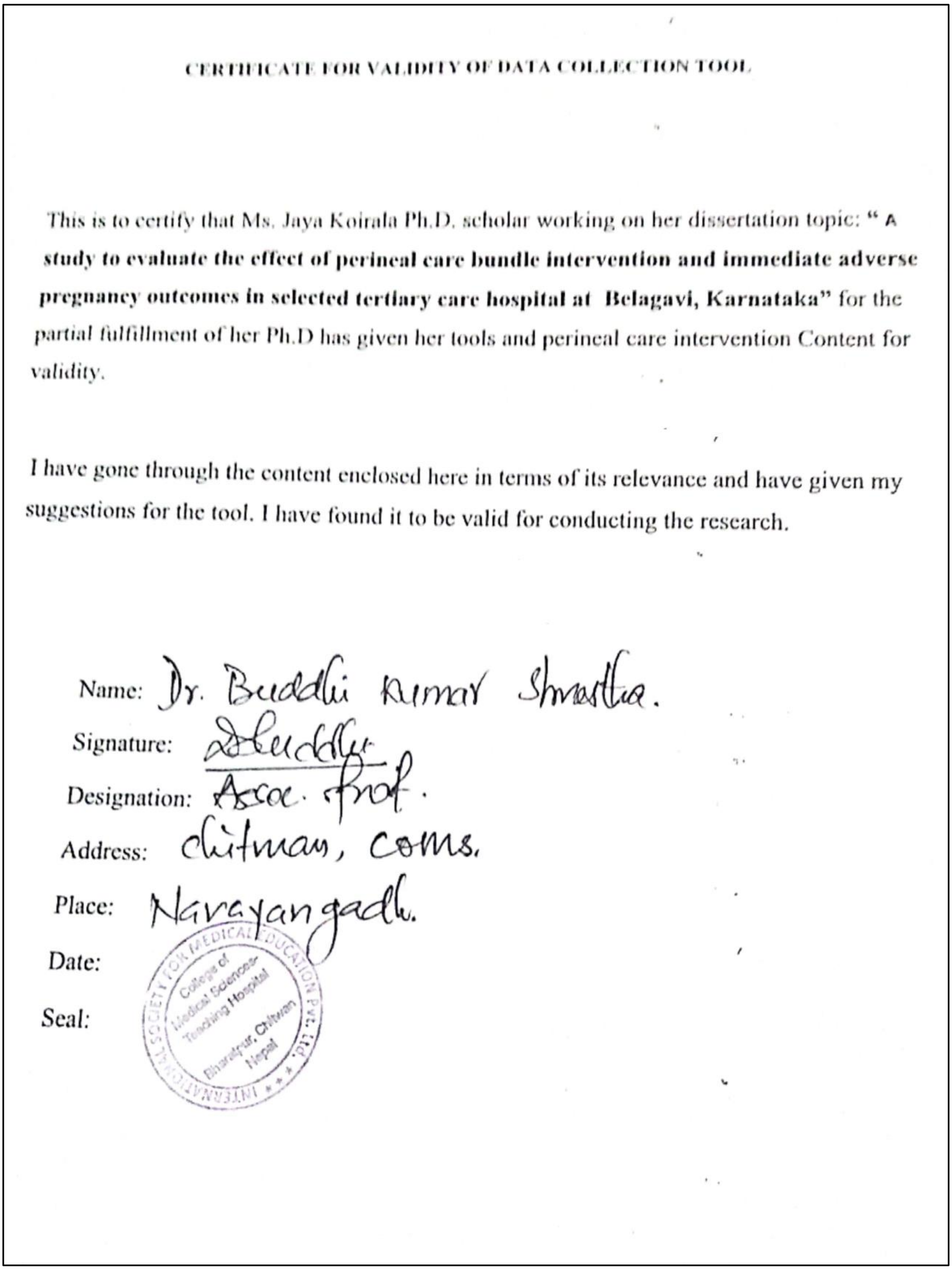
Address: Dept of OBG
USM KLE

Place: Belagavi

Date: 24/7/23.

Seal:

Dr. Muktha V. M. Alkunte
DGO, DNB
KMC Reg. No. 91405
Assistant Professor, Dept. of OBGyn.,
KLE CCH & MRC,
Yellur Road, Belagavi.

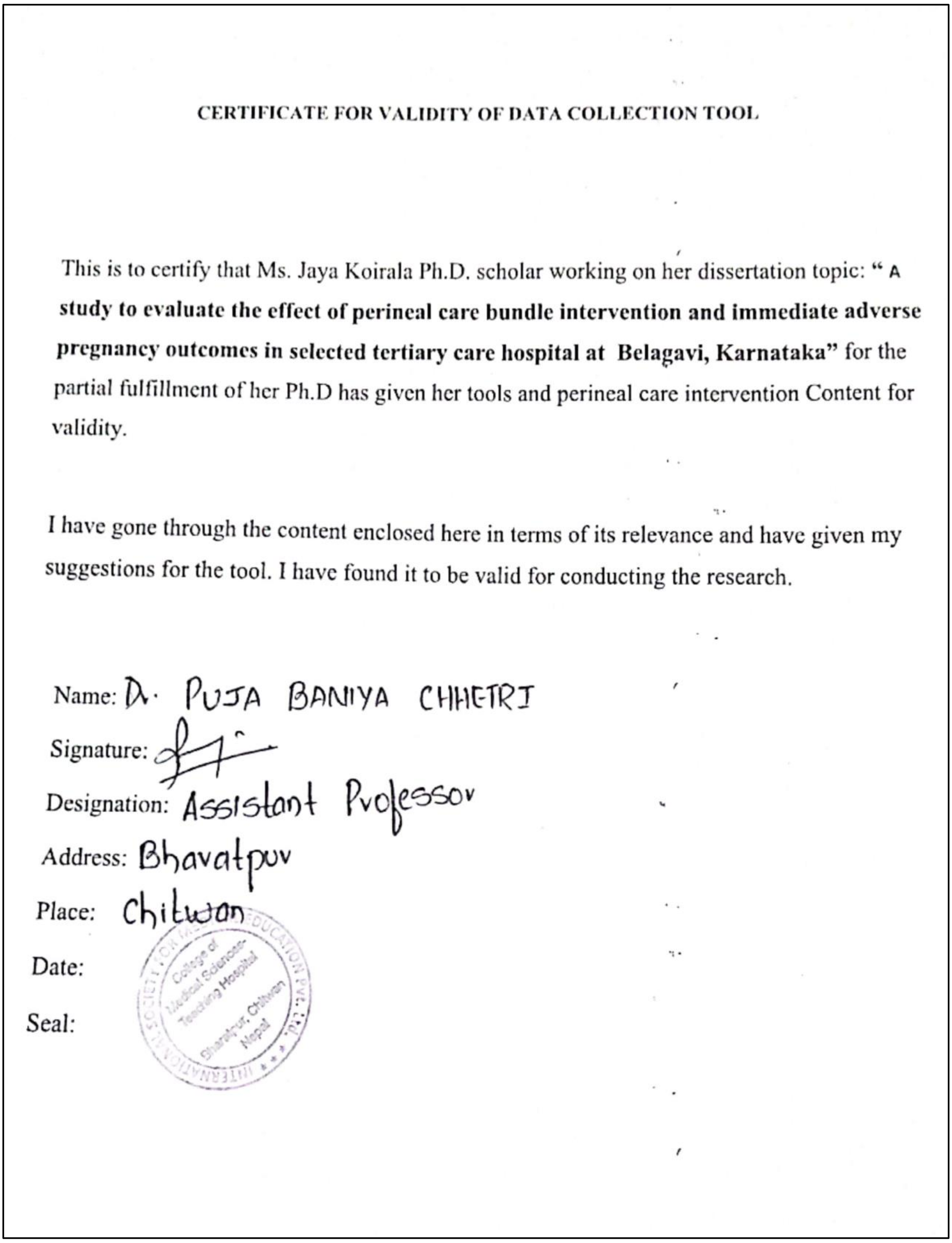


CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

This is to certify that Ms. Jaya Koirala Ph.D. scholar working on her dissertation topic: "**A study to evaluate the effect of perineal care bundle intervention and immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka**" for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have gone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Name: Dr. Buddhi Kumar Shrestha.
Signature:
Designation: Asso. Prof.
Address: Chitwan, CoMS.
Place: Narayangadh.
Date:
Seal: International Society for Medical Education Pvt. Ltd. College of Medical Sciences-Teaching Hospital Bharatpur, Chitwan Nepal

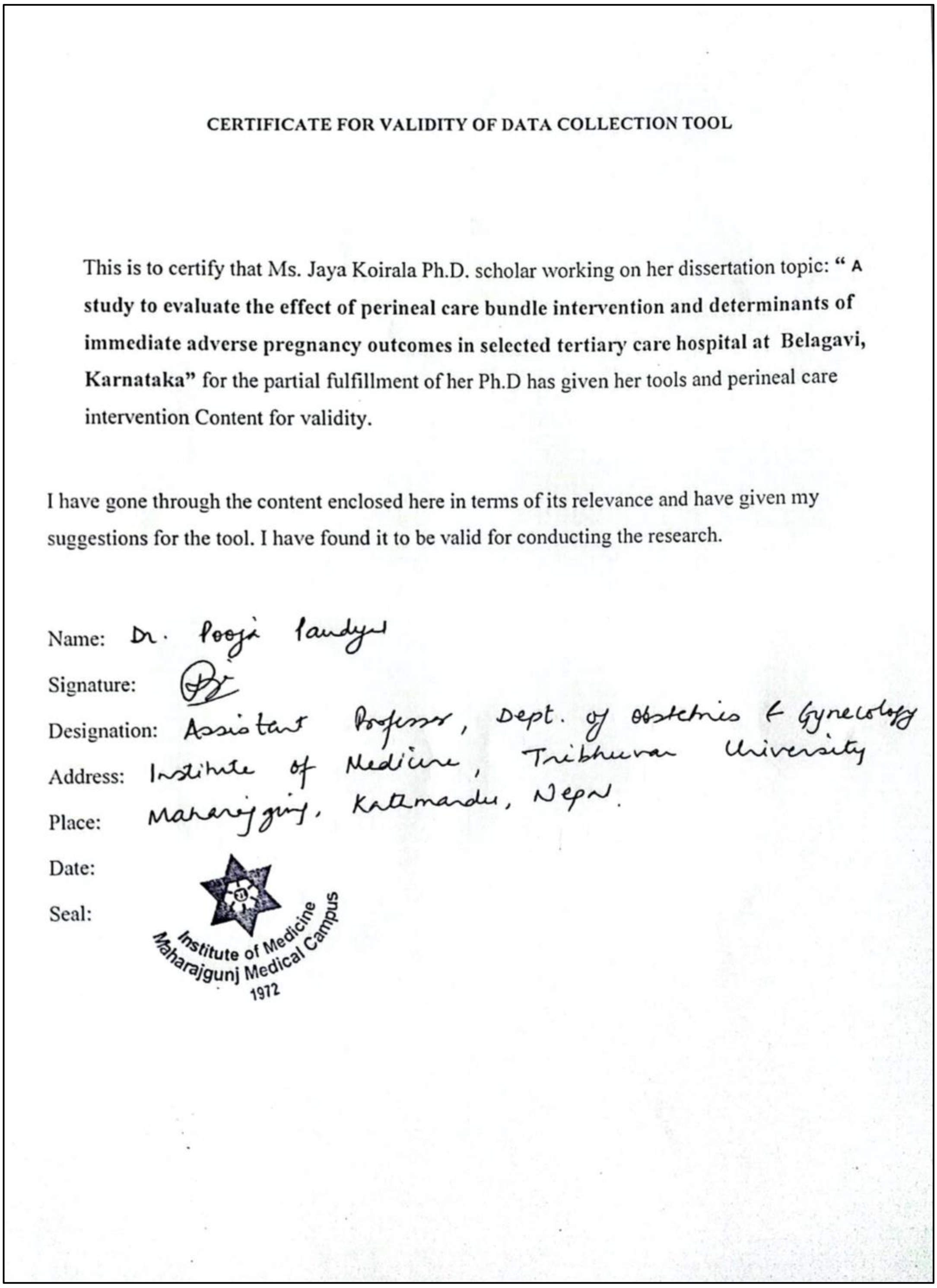


CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

This is to certify that Ms. Jaya Koirala Ph.D. scholar working on her dissertation topic: " **A study to evaluate the effect of perineal care bundle intervention and immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka"** for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have gone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Name: Dr. PUJA BANIYA CHHETRI
Signature:
Designation: Assistant Professor
Address: Bharatpur
Place: Chitwan
Date:
Seal: College of Medical Sciences-Teaching Hospital, Bharatpur, Chitwan, Nepal
International Society for Medical Education Pvt. Ltd.

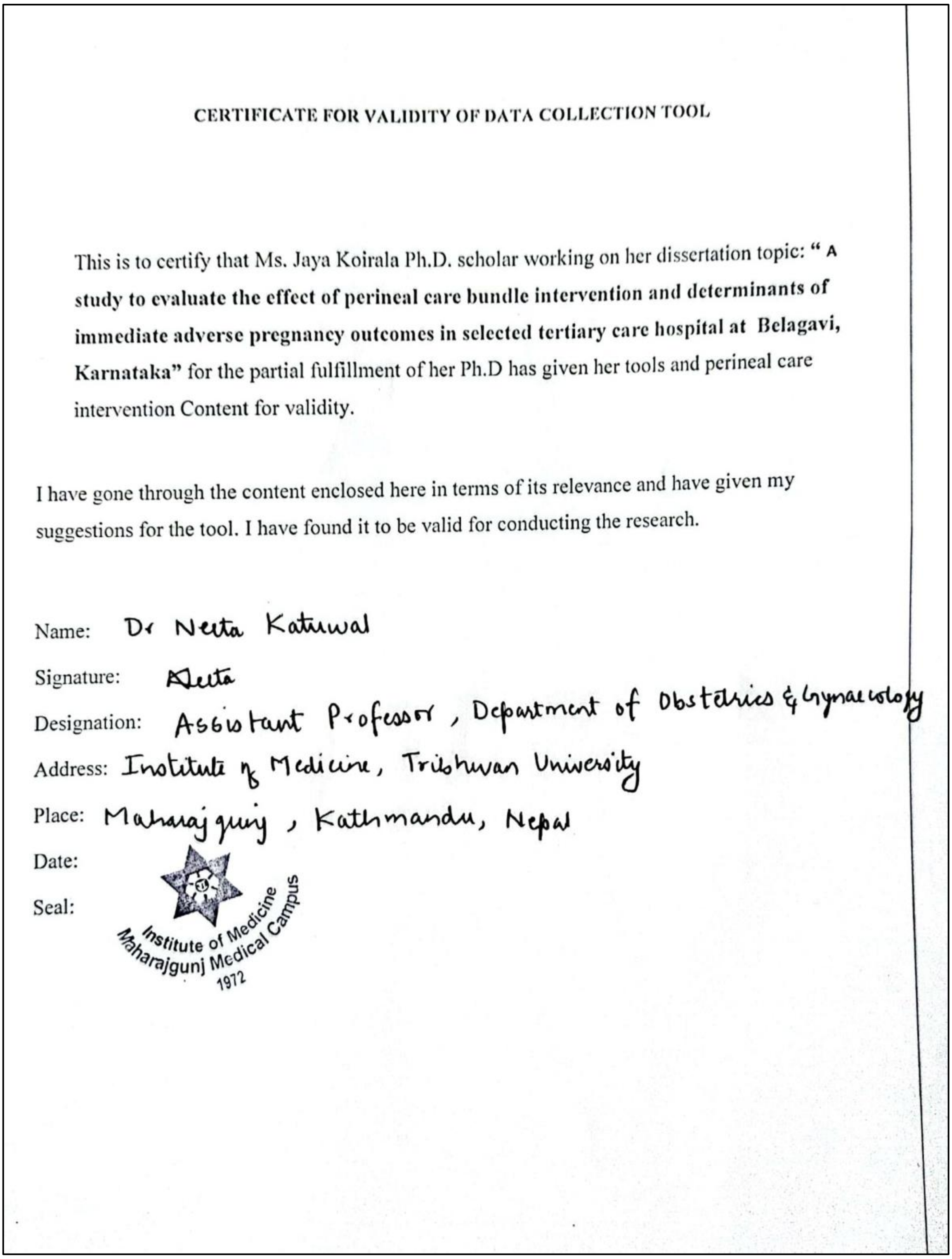


CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

This is to certify that Ms. Jaya Koirala Ph.D. scholar working on her dissertation topic: " **A study to evaluate the effect of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka"** for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have gone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Name: Dr. Pooja Paudyal
Signature:
Designation: Assistant Professor, Dept. of Obstetrics & Gynecology
Address: Institute of Medicine, Tribhuvan University
Place: Maharajgunj, Kathmandu, Nepal.
Date:
Seal: Institute of Medicine Maharajgunj Medical Campus 1972



CERTIFICATE FOR VALIDITY OF DATA COLLECTION TOOL

This is to certify that Ms. Jaya Koirala Ph.D. scholar working on her dissertation topic: " **A study to evaluate the effect of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka"** for the partial fulfillment of her Ph.D has given her tools and perineal care intervention Content for validity.

I have gone through the content enclosed here in terms of its relevance and have given my suggestions for the tool. I have found it to be valid for conducting the research.

Name: Dr Neeta Katuwal

Signature: Neeta

Designation: Assistant Professor, Department of Obstetrics & Gynaecology

Address: Institute of Medicine, Tribhuvan University

Place: Maharajgunj, Kathmandu, Nepal

Date:

Seal: Institute of Medicine Maharajgunj Medical Campus 1972

ANNEXURE -IV

INFORMED CONSENT FORM

This Informed Consent Form is for antenatal mother who get admitted in labor Room, and who we are inviting to participate in research on “A study to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka”

Name of Principal Investigator: Ms. Jaya Koirala Research Scholar, KLE Academic of higher education and research Centre Belagavi

Introduction

I am Ms. Jaya Koirala, Research Scholar, KLE University, doing a research on “A study to evaluate the effectiveness of perineal care bundle intervention and determinants of immediate adverse pregnancy outcomes in selected tertiary care hospital at Belagavi, Karnataka. This study includes the pregnant mothers who are admitted for delivery. So I would like to invite you to participate in the study.

Many women in the world are suffering from pregnancy and childbirth-related problems. Infection (puerperal infection) bacterial infection, fungal infection, and Iron deficiency anemia are common problems during pregnancy. Whereas, Preterm birth, Low birth weight, birth asphyxia, PPH and blood transfusion are adverse outcomes of delivery. This study may help to understand the outcomes of perineal care intervention and determinants and immediate adverse pregnancy outcomes.

In this study I would like to intervene by perineal care for prevention from puerperal infection and chorioamnionitis. High vaginal culture swab will be collected during admission and 72 hours after delivery before discharge for roll out the infection. For episiotomy patient, wound healing and pain assessment using REEDA scale for wound assessment and VAS scale for pain assessment will be done 6 to 10 hours, 20 to 24 hours and 40 to 48 hours of delivery This is a randomized controlled trial where the intervention group and non-intervention groups are defined as follows.

Intervention group – Mothers receiving perineal care by cleaning the perineal area with normal saline and 5% betadine (20 ml normal saline and 5 ml betadine 0.25%) for mothers with intact membranes. Perineal care was performed every 2 hours during vaginal examinations in the active first stage of labor, and perineal cleaning was done every 4 hours after delivery, and sterile perineal pads were changed frequently until discharge.

Non-intervention group – Self-care instruction (Participant mothers do perineal care themself after instruction). Outcomes of the intervention will be collected by patient's case file from postnatal ward before discharge. When infection was observed in the culture report the participants will refer to a gynecologist. At the time of discharge counseling was provided to the participant and the family regarding perineal care.

Information about your pregnancy related information, parity, antenatal care visit Hb level. It may take approximately 30 minutes to collect information. Some of the information related to mother and newborn will be collected from your hospital records.

Participation

Your participation in the study is self-motivated and your non participation is not going to make any difference in care what you are receiving now. At any stage of study, you can withdraw yourself from participation. The information collected from you will be kept confidential in both the cases.

Harms / Dangers

If you participate in this study there is no harm or dangers. But there is a possibility that few of our questions may lead you to recall uneventful/painful situations which you would like to forget.

Benefits

By participating in this study you may not get any direct benefit. But the possible benefits include health for you and your newborn. It also helps in identifying the determinants of immediate adverse pregnancy in pregnancy and its outcomes and rolling out any bacterial and fungal infection in the perineal area.

Financial Benefits Your participation in the study is purely self-motivated. You will not be given with any money/concession or gift for participation.

Confidentiality

Your name is nowhere used to maintain the confidentiality. In spite of name a particular code no is given for the information collected from you. Without exposing your identity collected information is used only for research purpose. Your pregnancy & child birth related information's are disseminated in results without disclosing your name.

Contact information

At this venture I have provided you the information about the research which I am interested to do. I have also given information about participation, dangers and benefits of participating in the study. Your participation is not mandatory. You can quit at any given time. If you have any doubts or questions, you can contact any time to Ms. Jaya Koirala, Research Scholar, KLE Academic of higher education and research Centre Belagavi University, Mobile No: 89511055065.

I am giving my consent to participate in the study by signing below

______________________ ______________________

Sign of Participant Name

Date

______________________ ______________________

Sign of Investigator Name

Date

CONSENT FORM

I have read this consent form and I have understood it. I have been given the opportunity to ask my query regarding the study & I have got satisfactory answers for them. I consent voluntarily to participate as a participant in this research.

Signature of participant: _______________

Signature of Researcher: ______________

Date:

Place:

If Illiterate

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

Name of witness_____________________ Thumb print of participant

Signature of witness ______________________

Date:

Place:

Statement by the researcher

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands above mentioned procedure.

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

A copy of this Informed Consent Form has been provided to the participant.

Name of Researcher / person taking the consent________________________

Signature of Researcher / person taking the consent__________________________

Date ___________________________

ಮಾಹಿತಿಪೂರ್ಣ ಸಮ್ಮತಿ ಪತ್ರ

ಈ ಮಾಹಿತಿಪೂರ್ಣ ಸಮ್ಮತಿ ಪತ್ರ, ಪ್ರಸೂತಿಪೂರ್ವ ಮಾಹಿತಿಗಾಗಿ ಇರುತ್ತದೆ. ಯಾರಿಗೆ ಲೇಬರ್‌ರೂಮ್‌ನಲ್ಲಿ ದಾಖಲ ಮಾಡಲಾಗಿದೆ. ಹಾಗೂ ಯಾರಿಗೆ ನಾವು ನಮ್ಮ ಅಭ್ಯಾಸದಲ್ಲಿ ಶಾಮೀಲ ಆಗಲು ಆಮಂತ್ರಿಸುತ್ತಿದ್ದೇವೆ. ಆ ಅಭ್ಯಾಸದ ಶಿರ್ಷಿಕೆ ಏನೇಂದರೆ - ಬೆಳಗಾವಿ, ಕರ್ನಾಟಕ ಇಲ್ಲಿಯ ವಿಭಾಗೀಯ ಹಾಸ್ಪೀಟಲ್‌ನಲ್ಲಿ ದಾಖಲ ಮಾಡಲಾಗಿರುವ ತಾಯಂದಿರುಗಳಿಗೆ ಪೆರೀನಿಯಲ್ ಶುಷ್ರೂಶೆಯ ಬಂಡಲ್ ಹಸ್ತಕ್ಷೇಪದ ಪರಿಣಾಮವನ್ನು ಅಳೆಯಲು ಮತ್ತು ಅದರ ಮೂಲಕ ಗರ್ಭಧಾರಣೆಯ ತಕ್ಷಣದ ಪ್ರತಿಕೂಲ ಫಲಿತಾಂಶಗಳನ್ನು ನಿರ್ಧರಿಸಲು ತಪಾಸಣೆ ನಡೆಸುವದು.

ಮುಖ್ಯ ಸಂಶೋಧಕರ ಹೆಸರು : ಕು. ಜಯಾ ಕೋಯಿರಾಲಾ
ಸಂಶೋಧನ ಸ್ನಾತಕ : ಕೆ.ಎಲ್.ಇ. ಉಚ್ಚ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆ ಹಾಗೂ ಸಂಶೋಧನ ಕೇಂದ್ರ ಬೆಳಗಾವಿ

ಪ್ರಸ್ತಾವನೆ :

ನಾನು, ಕು. ಜಯಾ ಕೋಯಿರಾಲಾ, ಸಂಶೋಧನ ಸ್ನಾತಕ ಕೆ. ಎಲ್. ಇ. ವಿದ್ಯಾಪೀಠ ಇದ್ದೇನೆ. ಹಾಗೂ ನಾನು ಬೆಳಗಾವಿ, ಕರ್ನಾಟಕ ಇಲ್ಲಿಯ ವಿಭಾಗೀಯ ಹಾಸ್ಪೀಟಲ್‌ನಲ್ಲಿ ದಾಖಲ ಮಾಡಲಾಗಿರುವ ತಾಯಂದಿರುಗಳಿಗೆ ಪೆರೀನಿಯಲ್ ಶುಷ್ರೂಶೆಯ ಬಂಡಲ್ ಹಸ್ತಕ್ಷೇಪದ ಪರಿಣಾಮವನ್ನು ಅಳೆಯಲು ಮತ್ತು ಅದರ ಮೂಲಕ ಗರ್ಭಧಾರಣೆಯ ತಕ್ಷಣದ ಪ್ರತಿಕೂಲ ಫಲಿತಾಂಶಗಳನ್ನು ನಿರ್ಧರಿಸಲು ತಪಾಸಣೆ ನಡೆಸುವದು. ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಇಂತಹ ಗರ್ಭವತಿ ಮಾತೆಯರ ಸಮಾವೇಶ ಇದ್ದಲ್ಲಿ ಆ ಪ್ರಸ್ತುತಿಗಾಗಿ ದಾಖಲಾಗಿದ್ದಾರೆ. ಆದರೆ ನಾನು ನಿಮಗೆ ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಸಹಭಾಗಿ ಆಗುವ ಸಲುವಾಗಿ ಆಮಂತ್ರಿಸುತ್ತಿದ್ದೇನೆ.

ಜಗತ್ತಿನಲ್ಲಿ ಅನೇಕ ಮಹಿಳಾ ಗರ್ಭಾವಸ್ಥೆ ಹಾಗೂ ಮಗುವಿಗೆ ಜನ್ಮ ನೀಡುವ ಸಲುವಾಗಿ ಸಮಸ್ಯಯುಳ್ಳವರಾಗಿದ್ದಾರೆ. ಸಂಸರ್ಗ (ಪ್ಯೂರಿಪೇರಲ್ ಸಂಸರ್ಗ) ಜಂತು ಸಂಸರ್ಗ, ಭೂಸ್ಟು (ಫಂಗಸ್) ಸಂಸರ್ಗ ಹಾಗೂ ಕಬ್ಬಿಣಾಂಶ ಕೊರತೆ, ರಕ್ತಕ್ಷಯ ಇವು ಈ ಗರ್ಭಾವಸ್ಥೆಯಲ್ಲಿಯ ಸಮಾನ ಸಾಮಾನ್ಯ ಸಮಸ್ಯಗಳಾಗಿವೆ. ಹಾಗೆಯೇ ಸಮಯ ಪೂರ್ವ ಪ್ರಸೂತಿ, ತೂಕ ಕಡಿಮೆ, (ಜನ್ಮದಲ್ಲಿ) ಜನ್ಮ ಎಸ್ಫಿಝಿಯಾ, ಪಿ.ಪಿ.ಎಚ್ ಹಾಗೂ ರಕ್ತ ಹಾಕುವುದು ಈ ಪ್ರಸೂತಿ ನಂತರದ ವಿರುದ್ಧ ಪರಿಣಾಮಗಳಾಗಿರುತ್ತವೆ. ಈ ಅಭ್ಯಾಸ ಪೆರಿನಿಯಲ್ ಶುಶ್ರೂಷೆ, ಮಧ್ಯಸ್ಥಿಕೆ, ಅದರ ಪರಿಣಾಮ ಹಾಗೂ ಗರ್ಭಾವಸ್ಥೆಯ ತತ್ಕಾಲ ವಿರುದ್ಧ ಪರಿಣಾಮ ತಿಳಿದುಕೊಳ್ಳಲು ಸಹಾಯಕವಾಗಬಹುದು.

ಈ ಅಭ್ಯಾಸ ಕ್ರಮದಲ್ಲಿ ನಾನು ಪೆರೀನಿಯಲ್ ಶುಶ್ರೂಷೆ ಮೂಲಕ ಮಧ್ಯಸ್ಥಿಕೆ ವಹಿಸಿ ಹೆರಿಗೆಯಲ್ಲಿಯ ಜ್ವರ ಹಾಗೂ ಕೀವು ಆಗಲು ಪ್ರತಿಬಂಧ ಹಾಗೂ ಕೋರೀಯೋಮ್ನಿಯಾನಿಟಿಸ್, ಮಾಡಲು ಇಚ್ಛುಕಳಿದ್ದೇನೆ. ಯೋನಿಯೊಳಗಿನ ಉಚ್ಚ ಜಂತು ಪ್ರವೇಶಕ್ಕಿಂತ ಮುಂಚೆ ಹಾಗೂ ಪ್ರಸೂತಿ ನಂತರದ 72 ಗಂಟೆಗಳಲ್ಲಿ ರೋಗಿಗೆ ಡಿಸ್ಚಾರ್ಜ್ ನೀಡುವ ಮುಂಚೆ ತೆಗೆದುಕೊಳ್ಳಲಾಗುವದು ಅದರ ಮುಖಾಂತಾರ ಸಂಸರ್ಗದ ತಪಾಸಣೆ ಮಾಡಲಾಗುವುದು. ಎಪೋಸಿಓಟೋಮಿ ರೋಗಿಗಳಿಗಾಗಿ, ಗಾಯ ಮಾಸಿಸುವವರೆಗೆ ಹಾಗೂ ವೇದನೆಯ ಪ್ರಮಾಣ ಅಳೆಯುವ ಸಲುವಾಗಿ ಆರ್.ಇ.ಇ.ಡಿ.ಎ. ಉಪಯೋಗಿಸ ಮಾಡಲಾಗುವುದು. ಅದು 6 ರಿಂದ 10, 20 ರಿಂದ 24 ಹಾಗೂ 40 ರಿಂದ 48 ಗಂಟೆಗಳ ನಡುವೆ ಪ್ರಸೂತಿ ನಂತರ ಮಾಡಲಾಗುವುದು. ಇದು ಒಂದು ಸಹಯೋಗದಿಂದ ಮಾಡಿದ ಕೇಸ್ ಗುಂಪು ಹಾಗೂ ಗುಂಪಿನ ನಿಯಂತ್ರಿತ ತಪಾಸಣೆ ಇದ್ದಲ್ಲಿ ಅದರ ವರ್ಣನೆ ಈ ಕೆಳಗಿನಂತೆ -

ಹಸ್ತಕ್ಷೇಪ ಗುಂಪು : ತಾಯಂದಿರಿಗೆ ಪೆರಿನಿಯಲ್ ಶುಶ್ರೂಷೆ ಕೊಡಲಾಗುವುದು ಅದು ಓಟಿಪೋಟದ (ಪೆರಿನೀಯಲ್) ಸ್ವಚ್ಛತೆ ಸಾಧಾರಣ ಸಲಾಯಿನ್ ಹಾಗೂ 5% ಬೆಟಾಡಿನ್ (20 ಎಂ.ಎಲ್ ಸಾಧಾರಣ ಸಲಾಯಿನ ಹಾಗೂ 5 ಎಮ.ಎಮ್ಲ. ಬೆಟಾಡಾಯಿನ 0.25%) ಇದು ಯಾರ ಶ್ಲೇಮ್ ಪರದೆ ಗಟ್ಟಿಯಾಗಿರುವುದೋ ಅಂತಹ ತಾಯಂದಿರಿಗಾಗಿ. ಓಟಿಪೋಟದ ಶುಶ್ರೂಷೆ ಪ್ರತಿ 2 ಗಂಟೆಯ ನಂತರ ಯೋನಿಯ ತಪಾಸಣೆ ಮಾಡುವ ಕಾಲಕ್ಕೆ ಮೊದಲ ಹಂತದಲ್ಲಿ ಜಾಗೃತೆ ಹೆರಿಗೆಯ ಕಾಲಕ್ಕೆ ಮಾಡಲಾಗುವುದು. ಹಾಗೂ ಓಟಿಪೋಟದ ಸ್ವಚ್ಛತೆ ಪ್ರಸೂತಿ ನಂತರ ಪ್ರತ್ಯೇಕವಾಗಿ 4 ತಾಸುಗಳ ನಂತರ ಮಾಡಲಾಗುವುದು. ಹಾಗೂ ಡಿಸ್ಚಾರ್ಜ್ ನೀಡುವವರೆಗೆ ನಿರ್ಜಂತು ಪ್ಯಾಡ್ ಮೇಲಿಂದ ಮೇಲೆ ಬದಲಾಯಿಸಬೇಕು.

ಹಸ್ತಕ್ಷೇಪ ಮಾಡದ ಗುಂಪು : ಸ್ವಯಂ ಆರೈಕೆಯ ಸೂಚನೆ (ಸೂಚನೆಯ ನಂತರ ಮಾತೆಯರು ಪೆರಿನೀಯಲ್ ಶುಶ್ರೂಷೆಯನ್ನು ಸ್ವತಃ ತಾವೇ ಮಾಡಿಕೊಳ್ಳುವದು) ಸದರೀ ದಾಖಲೆಯ ಪರಿಣಾಮ ರೋಗಿಯ ಕೇಸ್ ಫೈಲ್‌ನಿಂದ ಪ್ರಸೂತಿ ನಂತರದ ವಾರ್ಡಿನಿಂದ ಡಿಜ್ಚಾರ್ಜ್ ಆಗುವವರೆಗೆ ಸಂಗ್ರಹಿಸಲಾಗುವುದು. ಆಗ ಸಂಸರ್ಗ ರೋಗಿಯ ಪ್ರಕೃತಿಯಲ್ಲಿ ಕಾಣಿಸುವುದೋ ಆಗ ಸಹಮಾರ್ಗಕ್ಕೆ ಸಹ ಮಾರ್ಗಕ್ಕೆ ಸ್ತ್ರಿರೋಗ ತಜ್ಞರ ಕಡೆ ಕಳುಹಿಸಲಾಗುವುದು. ಡಿಸ್ಚಾರ್ಜ್ ನೀಡುವ ಕಾಲಕ್ಕೆ ರೋಗಿಗೆ ಹಾಗೂ ಅವರ ಕುಟುಂಬಕ್ಕೆ ಪೆರಿನೀಯಲ್ (ಓಟಿಪೋಟಿನ) ಸ್ವಚ್ಛತೆಯ ಬಗ್ಗೆ ತಿಳುವಳಿಕೆ ನೀಡಲಾಗುವುದು.

ನಿಮ್ಮ ಗರ್ಭಾವಸ್ಥೆಯ ಬಗ್ಗೆ ಮಾಹಿತಿ ಅದಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟ ಮಾಹಿತಿ, ಅದರ ಗುಣಮಟ್ಟ ಪ್ರಸೂತಿ ನಂತರದ ಶುಶ್ರೂಷೆ, ಹಾಗೂ ಎಚ್. ಬಿ. ಮಟ್ಟ ಆ ಬಗ್ಗೆ ಮಾಹಿತಿ ಪಡೆಯಲಾಗುವುದು. ಸದರೀ ಮಾಹಿತಿ ಪಡೆಯುವ ಸಲುವಾಗಿ ಅಂದಾಜು 30 ನಿಮಿಷಗಳು ತಗಲುತ್ತವೆ. ತಾಯಿ ಹಾಗೂ ನವಜಾತ ಶಿಶುವಿನ ಯಾವುದೇ ಮಾಹಿತಿ, ನಿಮ್ಮ ಆಸ್ಪತ್ರೆಯಲ್ಲಿಯ ದಾಖಲೆಗಳಿಗೆ ಪಡೆಯಲಾಗುವುದ.

ಸಹಭಾಗಿತ್ವ :

ಈ ಅಭ್ಯಾಸದಲ್ಲಿಯ ನಿಮ್ಮ ಸಹಭಾಗಿತ್ವ ಸ್ವಸಂಚಾಲಿತವಾಗಿರುವದು, ಹಾಗೂ ಒಂದು ವೇಳೆ ನೀವು ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಸಹಭಾಗಿ ಆಗಿರದಿದ್ದಲ್ಲಿ ಅದರ ನೀವು ತೆಗೆದುಕೊಳ್ಳುತ್ತಿರುವ ಶುಶ್ರೂಷೆಯ ಮೇಲೆ ಯಾವುದೇ ಪರಿಣಾಮ ಬೀಳುವುದಿಲ್ಲ. ಈ ಅಭ್ಯಾಸದಲ್ಲಿ ನೀವು ಯಾವುದೇ ಕಾಲಕ್ಕೆ ಈ ಅಭ್ಯಾಸ ಕ್ರಮದಿಂದ ಸಹಭಾಗಿಯಾಗಲು ನಿರಾಕರಿಸಬಹುದು. ಎರಡೂ ವಿಷಯದಲ್ಲಿ ನಿಮ್ಮ ಕಡೆಯಿಂದ ಜಮಾ ಮಾಡಲಾದ ಮಾಹಿತಿ ಗುಪ್ತವಾಗಿರಿಸಲಾಗುವದು.

ಅಪಾಯ/ಹಾನಿ :

ಒಂದು ವೇಳೆ ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಸಹಭಾಗಿದ್ದಲ್ಲಿ ಅದರಿಂದ ಯಾವುದೇ ಅಪಾಯ ಅಥವಾ ಹಾನಿ ಇರುವುದಿಲ್ಲ. ಆದರೆ ಇಲ್ಲಿ ಸಂಭವನೀಯವಾಗಿ ನಾವು ಕೇಳುವ ಪ್ರಶ್ನೇಗಳಿಂದ ನಿಮಗೆ ನಿಮ್ಮ ಗತ ಕಾಲದಲ್ಲಿಯ ವೇದನೆಗಳ ನೆನಪು ಬರಬಹುದು. ಆದರೆ ನೀವು ಅವುಗಳನ್ನು ಮರೆಯುವ ಪ್ರಯತ್ನ ಮಾಡುತ್ತಿರಬಹುದು.

ಲಾಭಗಳು :

ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಸಹಭಾಗಿ ಆಗುವುದರಿಂದ ನಿಮಗೆ ಕೆಲವೊಂದು ನೇರ ಲಾಭಗಳು ಆಗುವುದಿಲ್ಲ. ಆದರೆ ಸಂಭವನೀಯ ಲಾಭಗಳು ಅಂದರೆ ನಿಮ್ಮ ಹಾಗೂ ನಿಮ್ಮ ನವಜಾತ ಶಿಶುವಿನ

ಆರೋಗ್ಯ ಚೆನ್ನಾಗಿರುವದು. ಆದರ ಮೂಲಕ ಗರ್ಭಾವಸ್ಥೆಯಲ್ಲಿಯ ತ್ವರಿತ ವಿಪರೀತ ಪ್ರಸೂತಿ ಪರಿಣಾಮಗಳ ಘಟಕಗಳ ಮೂಲಕ ಆಗುತ್ತವೆ. ಅವುಗಳ ಮಾಹಿತಿ ದೊರೆಯುತ್ತದೆ.

ಆರ್ಥಿಕ ಲಾಭಗಳು :

ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿಯ ನಿಮ್ಮ ಸಹಭಾಗಿತ್ವ ಇದು ನಿವ್ವಳ ಐಚ್ಛಿಕ ಇರುತ್ತದೆ. ನಿಮಗೆ ಈ ಸಹಭಾಗಿತ್ವದಿಂದ ಯಾವುದೇ ಹಣ/ಸೌಲತ್ತು ಅಥವಾ ಉಡುಗೊರೆ ದೊರೆಯುವುದಿಲ್ಲ.

ಗೌಪ್ಯತೆ :

ಗೌಪ್ಯತೆ ಕಾಪಾಡಲು ನಿಮ್ಮ ಹೆಸರನ್ನು ಎಲ್ಲಿಯೂ ಉಲ್ಲೇಖ ಮಾಡಲಾಗುವುದಿಲ್ಲ. ನಿಮ್ಮ ಹೆಸರಿನ ಬದಲಾಗಿ ನಿಮ್ಮ ಕಡೆಯಿಂದ ಪಡೆಯಲಾದ ಮಾಹಿತಿಗೆ ಒಂದು ಸಾಂಕೇತಿಕ ನಂಬರ ಕೊಡಲಾಗುವದು ನ್ಮಮ ಗುರುತು ಹೊರಬರದಂತೆ ಜಮಾ ಮಾಡಲಾದ ಮಾಹಿತಿಯ ಉಪಯೋಗ ಕೇವಲ ಸಂಶೋಧನೆಗಾಗಿ ಮಾಡಲಾಗುವುದು. ನಿಮ್ಮ ಗರ್ಭಾವಸ್ಥೆಯರಿಗೆ ಹಾಗೂ ನಿಮ್ಮ ಜನ್ಮಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಮಾಹಿತಿ ನಿಷ್ಕರ್ಷೆಗಾಗಿ ಜಮಾ ಮಾಡಲಾಗುವದು. ನಿಮ್ಮ ಗುರುತು ಹೇಳದೇ.

ಸಂಪರ್ಕ ಮಾಹಿತಿ :

ಇಲ್ಲಿಯವರೆಗೆ ನಾನು ನಿಮಗೆ ಈ ಅಭ್ಯಾಸಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಮಾಹಿತಿ ಕೊಟ್ಟಿದ್ದು ಆದೆ. ಆ ಕಾರಣಕ್ಕಾಗಿ ನಾನು ಉತ್ಸುಕಳಾಗಿದ್ದೇನೆ. ನಾನು ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಸಹಭಾಗಿ ಆಗುವ ಸಲುಟವಾಡಿಗಿ ಮಾಹಿತಿ ಅಂದರೆ ಸಹಭಾಗಿ, ಹಾನಿ, ಹಾಗೂ ಲಾಭ ಕೊಡಲಾಗಿದೆ. ನಿಮ್ಮ ಸಹಭಾಗ ಇದು ಒತ್ತಾಯಪೂರ್ವಕವಾಗಿ ಇಲ್ಲ. ನೀವು ಇದರಿಂದ ಯಾವಾಗಲೂ ಹೊರ ಬರಬಹುದು. ಒಂದು ವೇಳೆ ನಿಮಗೆ ಏನಾದರೂ ಸಂಶಯ ಅಥವಾ ಪ್ರಶ್ನೇಗಳಿದ್ದಲ್ಲಿ ನೀವು ಕು. ಜಯಾ ಕೋಯಿರಾಲಾ, ಸಂಶೋಧನ ಸ್ನಾತಕ, ಕೆ.ಎಲ್.ಇ. ಉಚ್ಚ ಶಿಕ್ಷಣ ಸಂಸ್ಥೆ ಹಾಗೂ ಸಂಶೋಧನೆ ಕೇಂದ್ರ ಬೆಳಗಾವಿ ಇವರನ್ನು ಮೋಬೈಲ್ ನಂ. 89511055065 ನಲ್ಲಿ ಯಾವಾಗಲೂ ಸಂಪರ್ಕ ಸಾಧಿಸಬಹುದು.

ನಾನು ಈ ಅಭ್ಯಾಸಕ್ರಮದಲ್ಲಿ ಸಹಭಾಗಿ ಆಗುವ ಸಲುವಾಗಿ ಕೆಳಗೆ ಸಹಿ ಮಾಡಿ ಸಮ್ಮತಿ ಕೊಟ್ಟಿದ್ದೇನೆ.

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ಸಹಭಾಗಿಯಾಗುವವರ ಸಹಿ	ಹೆಸರು	ದಿನಾಂಕ
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ಸಂಶೋಧಕರ ಸಹಿ	ಹೆಸರು	ದಿನಾಂಕ

माहितीपूर्ण संमतीपत्र

हे माहितीपूर्ण संमतीपत्र प्रसुतीपूर्व मातांसाठी आहे ज्यांना लेबररुममध्ये दाखल करण्यात आले आहे. आणि ज्यांना आम्ही आमच्या अभ्यासामध्ये सामील होण्यासाठी आमंत्रीत करीत आहोत. त्या अभ्यासाचे शिर्षक आहे "बेळगावी कर्नाटक येथील विभागीय हॉस्पीटलमध्ये दाखल करण्यात आलेल्या मातांना पेरीनियल (ओटीपोट) शुश्रुषेचा अंतर्भाव करुन त्याद्वारे तत्काळ विरुध्द प्रेग्नन्सी परिणामांची चाचणी करणे."

प्रधान संशोधकाचे नांव : मिस जया कोईराला

संशोधन स्नातक, के.एल.ई. उच्च शिक्षण संस्था आणि संशोधन केंद्र, बेळगांवी

प्रस्तावना :

मी मिस. जया कोईराला, संशोधन स्नातक के. एल. ई. विद्यापीठ आहे आणि मी "बेळगावी कर्नाटक येथील विभागीय हॉस्पीटलमध्ये दाखल करण्यात आलेल्या मातांना पेरीनियल (ओटीपोट) सुश्रुषेचा अंतर्भाव करुन त्याद्वारे तत्काळ विरुध्द प्रेग्नन्सी परिणामांची चाचणी करणे" या विषयाचा अभ्यास के.एल.ई डॉ. प्रभाकर कोरे हॉस्पीटल आणि वैद्यकीय संशोधन केंद्र येथे करीत आहे. या अभ्यासामध्ये अशा गर्भवती मातांचा समावेश असेल ज्या प्रस्तुतीसाठी दाखल झालेल्या आहेत. तरी मी तुम्हाला या अभ्यासामध्ये सहभागी होण्यासाठी आमंत्रित करीत आहे.

जगामध्ये अनेक महिला गर्भावस्था आणि मुलाला जन्म देण्यासंबंधीत समस्याने ग्रस्त आहेत. संसर्ग (प्युरीपेरल संसर्ग) जंतु संसर्ग, शेवाळी (फंगस) संसर्ग आणि लोहाची कमतरता, रक्तक्षय हे या गर्भावस्तातल्या समान समस्या आहेत. तसेच समयपूर्व प्रसुती, कमीवजन, (जन्मता) जन्म एस्पीझिया, पी. पी.एच. आणि रक्त चढवणे हे प्रसुतीनंतरचे विरुध्द परिणाम आहेत. हा अभ्यास पेरिनियल (ओटीपोट) सुश्रुषा, मध्यस्थी, त्याचे परिणाम आणि गर्भावस्थेचे तत्काळ विरुध्द परिणाम समजण्यास मदत करु शकेल.

या अभ्यासामध्ये मी पेरीनिअल सुश्रुषेद्वारा मध्यस्थी करुन बाळंतपणामधील ताप, संसर्ग आणि 'पू' धारणेस प्रतिबंध तसेच कोरीओम्नीयानीटीस, करण्यास इच्छुक आहे. योनीतील उच्च जंतु प्रवेशापूर्वी आणि प्रस्तुतीनंतरच्या ७२ तासामध्ये रुग्णास डिसचार्ज देण्यापूर्वी घेतले जातील ज्याद्वारे संसर्गाची तपासणी केली जाईल. एपोसीओटोमी रुग्णांसाठी, जखम बरे होण्याची आणि वेदनांचे मोजमाप करण्यासाठी आर ई ईडी ए वापरुन करण्यात येईल. ते ६ ते १०, २० ते २४, आणि ४० ते ४८ तासामध्ये प्रसुतीनंतर केले जाईल. ही एक सहजगत्या केलेली केस गट आणि गटांची नियंत्रित तपासणी असेल त्याचे वर्णन पुढीलप्रमाणे –

हस्तक्षेप गट : मातांना पेरीनियल सुश्रुषा दिली जाईल ती ओटीपोटाची (पेरिनियल) स्वच्छता साधारण सलाईन आणि ५% बेटाडाईन (२० एम. एल. साधारण सलाईन आणि ५ एम एल. बेटाडाईन ०.२५%) हे ज्यांचे श्लेम पडदा शाबूत आहे अशा मातांसाठी. ओटीपोटाची सुश्रुषा दर २

तासानी योनीची तपासणी करतेवेळी पहिल्या स्टेजमधील जागृत प्रसव वेदनेवेळी केली जाईल. आणि ओटीपोटाची स्वच्छता प्रसुतीनंतर प्रत्येक ४ तासानंतर केली जाईल. आणि डिसचार्ज देईपर्यंत निर्जंतुक पॅड वरचेवर बदलले जातील.

हस्तक्षेप गटांचा उपयोग न करता : स्व-सुश्रुषा सुचना (सहभागी माता या सुचनेनंतर त्यांच्या ओटीपोटाची स्वच्छता त्याच करतील. या दखलीचे परिणाम रुग्णाच्या केस फाईलमधून प्रसुतीनंतरच्या वॉर्डमधून डिसचार्ज देण्यापूर्वी गोळा केले जातील. जेंव्हा संसर्ग रुग्णाच्या कल्चरमध्ये आढळेल तेंव्हा सहमार्गास स्त्रीरोगतज्ञाकडे पाठविले जाईल. डिसचार्ज देतेवेळी रुग्णास आणि त्याच्या कुटुंबियास पेरिनियल (ओटीपोटाच्या) स्वच्छतेबाबत समोपदेशन केले जाईल.

तुमच्या गर्भारपणाबद्दलची माहिती त्याच्याशी संबंधीत माहिती, त्याचा दर्जा, प्रसुतीनंतरची सुश्रुषा, आणि एच. बी. पातळी या बद्दलची माहिती घेतली जाईल. ही माहिती मिळविण्यासाठी अंदाजे ३० मिनीटे लागतील. माता आणि नवजात बालकाची काही माहिती, तुमच्या दवाखान्यातील रेकॉर्ड मधून मिळविली जाईल.

सहभाग :

या अभ्यासातील तुमचा सहभाग स्वसंचालित असेल, आणि जर तुम्ही या अभ्यासात सहभागी झाला नसाल तर त्याचा तुम्ही सध्या घेत असलेल्या सुश्रुषेवर कोणताही परिणाम होणार नाही. या अभ्यासात तुम्ही कोणत्याही वेळी या अभ्यासात सहभागी होण्यास नकार दर्शवू शकता. दोन्ही बाबींमध्ये तुमच्याकडून गोळा केलेली माहिती गुप्त राखली जाईल.

अपाय/धोका :

जर तुम्ही या अभ्यासात सहभागी झाला असाल तर त्यात कोणताही अपाय अथवा धोका नाही. पण येथे ही शक्यता आहे की आमच्या कांही प्रश्नामुळे तुम्हास गतकाळातील वेदनादायक आठवणी येऊ शकतील ज्या तुम्ही विसरण्याचे प्रयत्न करता आहेत.

फायदे :

या अभ्यासात सहभागी होण्यामुळे तुम्हास काही थेट फायदे होणार नाहीत. परंतु संभाव्य फायदे हे आहेत की तुमची आणि तुमच्या नवजात अर्भकाची तब्येत चांगली राहील. याद्वारे गर्भावस्थामधील तत्काळ विपरीत प्रसुती परिणाम ज्या घटकाद्वारे होतात त्याची माहिती मिळू शकेल.

आर्थिक फायदे :

या अभ्यसामधील तुमचा सहभाग हा निव्वळ ऐच्छिक आहे. तुम्हास या सहभागामुळे कांहीही पैसे /सवलत अथवा भेट मिळणार नाही.

गोपनियता :

गुप्तता पाळण्यासाठी तुमच्या नावाचा कोठेही उल्लेख केला जाणार नाही. तुमच्या नावाऐवजी तुमच्याकडून गोळा केलेल्या माहितीस एक सांकेतीक नंवर देण्यात येईल. तुमची ओळख उघड न करता जमा झालेली माहितीचा उपयोग फक्त संशोधनाकरीता केला जाईल. तुमची गर्भावस्थांशी आणि अपत्य जन्माशी संबंधीत माहिती निष्कर्षासाठी जमा केली जाईल. तुमची ओळख उघड न करता.

संपर्क माहिती :

येथपर्यंत मी तुम्हांस या अभ्यासासंबंधी माहिती दिली आहे. जो करण्यास मी उत्सुक आहे मी या अभ्यासात सहभागी होण्यासंबंधीची माहिती जसे की सहभाग, धोके आणि फायदे दिली आहे. तुमचा सहभाग हा सक्तीचा नाही. तुम्ही यातुन केंव्हाही बाहेर पडू शकता. जर तुम्हास कांही शंका अथवा प्रश्न असल्यास तुम्ही मिस जया कोईराला, संशोधन स्नातक, के.एल.ई. उच्च शिक्षण संस्था आणि संशोधन केंद्र, बेळगांव, यांच्याशी मोबाईल क्र. ८९५११०५५०६५ वर कधीही संपर्क साधु शकता.

मी या अभ्यासामध्ये सहभागी होण्यासाठी खाली सही करुन संमती दिली आहे.

____________________________	_____	_______________
सहभागी होण्याऱ्याची सही	नांव	तारीख
____________________________	______	_______________
संशोधकाची सही	नांव	तारीख

संमती पत्र

मी हे संमतीपत्र वाचले असून ते मला समजले आहे. मला अभ्यासासंबंधी माझे प्रश्न विचारण्याची संधी दिली गेली असून मला समाधानकारक उत्तरे मिळाली आहेत. मी ऐच्छिकरित्या या अभ्यासामध्ये सहभागी होण्यासाठी संमती देत आहे.

भाग घेणाऱ्याची सही __________

संशोधकाची सही _________

तारीख :

स्थळ

जर निरक्षर असेल तर :

मी संभाव्य सहभागी होणाऱ्यास वाचून दाखविण्यात आलेल्या संमतीपत्रास साक्षीदार आहे, आणि त्या व्यक्तीस प्रश्न विचारण्याची संधी दिली गेली. आणि मी हे निश्चित करतो की त्या व्यक्तीने आपली संमती मुक्तपणे दिली आहे.

साक्षीदाराचे नांव __________ **सहभागी होणाऱ्याच्या अंगठ्याचा ठसा**

साक्षीदाराची सही _________

तारीख :

स्थळ :

संशोधकाचे निवेदन :

मी संभाव्य सहभागी माहितीपत्रक बरोबर वाचून दाखविले. आणि माझ्या क्षमतेनुसार मी हे निश्चित केले की सहभागीस वर उल्लेखलेल्या प्रक्रियाचे आकलन झाले.

मी निश्चित करतो की सहभागीस अभ्यासासंबंधी प्रश्न विचारण्याची संधी दिली गेली आणि सहभागीने विचारलेल्या सर्व प्रश्नांची उत्तरे बरोबर, माझ्या अत्युच्च क्षमतेनुसार दिले गेले. मी हे निश्चित करतो की या व्यक्तीस अभ्यासात सहभागी होण्यासाठी कोणतीही बळजबरी केली गेली नाही आणि ही संमती मुक्तपणे आणि ऐच्छिकपणे दिली गेली आहे.

या माहितीपूर्ण संमतीपत्राची एक प्रत सहभागीस दिली गेली आहे.

संशोधकाचे नाव / व्यक्ती जी संमतीपत्र घेत आहे.

संशोधकाची सही/ व्यक्ती जी संमतीपत्र घेत आहे तिची सही आअ

तारीख : _________

ANNEXURE -V

PERFORMA FOR DATA COLLECTION

A. SOCIODEMOGRAPHIC INFORMATION

Sr. No	Variables with Code	Responded Code
1	Name, Address, and IP No ………	
2	Age of the mother…………	
3	Religion – 1. Hindu 2. Muslim 3.Others ………..	
4	Education level of the Mother 1. Illiterate 2. Primary 3. Secondary 4. PUC 5. Graduation 4. Post-Graduation	
5	Occupation of Woman 1. Housewife 2. Agriculture 3. Private Service 4. Government service 5. Others…………	
6	Residence – 1. Urban 2. Semi-urban 3. Rural	
7	Type of Marriage 1 Consanguineous 2 Nonconsanguineous	
8	Dietary Pattern 1. Pure vegetarian 2. Vegetarians consume egg 3. Mixed diet (Vegetarian and nonvegetarian)	
9	Smoking habit 1. Yes 2.No	
10	Alcoholic habit 1. Yes 2. No	
11	Monthly family income in Indian currency…..	

B. PREGNANCY RELATED INFORMATION

12	Information of pregnancy: Parity …………..	
13	Total ANC Visit during your pregnancy……	
14	Hb% level during labor………….	
15	Episiotomy 1. Yes 2. No	

C. NEONATAL IMMEDIATE ADVERSE OUTCOMES (According to patient's case sheet)

16	Neonatal immediate adverse pregnancy outcomes 1.Birth asphyxia 1. Yes 2. No 2.Birth weight ………… 3. Gestational age of birth …………	

D. MATERNAL IMMEDIATE ADVERSE PREGNANCY OUTCOMES (according to patient's case sheet)

17	Maternal Immediate adverse birth outcomes 1 Post Partum Haemorrhage 1. Yes 2. N0 2. Blood Transfusion 1. Yes 2. No	

ದತ್ತಾಂಶ ಸಂಗ್ರಹದ ಕ್ರಮ ಪತ್ರ

ಎ. ಸಾಮಾಜಿಕ-ಜನಸಾಮಾನ್ಯ ಮಾಹಿತಿ

ಶ್ರೀ. ಸಂ	**ಕೋಡುಗಳೊಂದಿಗೆ ವ್ಯಾಖ್ಯಾನಿಸಲಾಗಿರುವ ವಿಚಾರಗಳು**	**ಸ್ವರೂಪಿಸಿದ ಕೋಡ್**
೧	ಹೆಸರು, ವಿಳಾಸ, ಮತ್ತು ಅಂತಿಮ ರೋಗಿ ಸಂಖ್ಯೆ…….	
೨	ತಾಯಿಯ ವಯಸ್ಸು………..	
೩	**ಧರ್ಮ** ೧. ಹಿಂದೂ ಮುಸ್ಲಿಂ ಇತರರು	
೪	**ತಾಯಿಯ ಶಿಕ್ಷಣ ಹಂತ** ೧. ಶಿಕ್ಷಾಹೀನ ೨. ಪ್ರಾಥಮಿಕ ೩ . ದ್ವಿತೀಯರೀತಿ ೪.ಪಿಯುಸಿ (PUC) ೫. ಸ್ನಾತಕ ೬. ಪೋಸ್ಟ್-ಗ್ರಾಜುಯೇಟ್	
೫	**ಮಹಿಳೆಯ ಕೆಲಸ** ೧. ಗೃಹಿಣಿ ೨. ಕೃಷಿ ೩ . ಖಾಸಗಿ ಸೇವೆ ೪. ಸರ್ಕಾರಿ ಸೇವೆ ೫ . ಇತರರು………….	
೬	**ನಿವಾಸ** ೧ .ನಗರ ೨. ಅರ್ದಿಗೆ ನಗರ ೩. ಗ್ರಾಮೀಣ	
೭	**ವಿವಾಹ ಪ್ರಕಾರ** ೧ . ಸಂಸಂಗಿ ವಿವಾಹ ೨. ಅಸಂಸಂಗಿ ವಿವಾಹ	
೮	**ಆಹಾರ ನಿಯಮನ** ೧. ಶುದ್ಧ ಶಾಕಾಹಾರ ೨. ಮೊಳಗಿ ತಿನ್ನುವ ಶಾಕಾಹಾರ ೩. ಮಿಶ್ರಿತ ಆಹಾರ (ಶಾಕಾಹಾರ ಮತ್ತು ಅಶಾಕಾಹಾರ)	
೯	**ಧೂಮಪಾನ ಹಾಗೂ ಸೇವನ ಸಾಮರ್ಥ್ಯ** ೧. ಹೌದು ೨. ಇಲ್ಲ	
೧೦	**ಮದ್ಯಪಾನ ಅಭ್ಯಾಸ** ೧. ಹೌದು (Yes) ೨. ಇಲ್ಲ	
೧೧	ಭಾರತೀಯ ನಾಣ್ಯದಲ್ಲಿ ವಾರ್ಷಿಕ ಕುಟುಂಬ ಆದಾಯ……	

ಬಿ. ಗರ್ಭಾವಸ್ಥೆ ಸಂಬಂಧಿತ ಮಾಹಿತಿ

೧೨	ಗರ್ಭಾವಸ್ಥೆಯ ಮಾಹಿತಿ: ಪ್ಯಾರಿಟಿ……	
೧೩	ನಿಮ್ಮ ಗರ್ಭಾವಸ್ಥೆಯ ಸಮಯದಲ್ಲಿ ಒಟ್ಟು ಎನ್‌ಸಿ ಸಂದರ್ಶನಗಳು..	
೧೪	ಶ್ರಮದ ಸಮಯದಲ್ಲಿ ಹೀಮೋಗ್ಲೊಬಿನ್ ಮಟ್ಟ………..	
೧೫	**ಇಪಿಸಿಯೋಟಮಿ** ೧. ಹೌದು ೨. ಇಲ್ಲ	

ಸಿ. ನೀನೇಟಲ್ ತಕ್ಷಣ ಪ್ರತಿಕೂಲ ಪರಿಣಾಮಗಳು

೧೬	**ನೀನೇಟಲ್ ತಕ್ಷಣ ಪ್ರತಿಕೂಲ ಗರ್ಭಾವಸ್ಥೆ ಪರಿಣಾಮಗಳು** ೧. ಹುಟ್ಟಿದ ಮೊಗಾಣ ೧. ಹೌದು ೨. ಇಲ್ಲ ೨. ಹುಟ್ಟಿದ ತೂಕ ೩. ಹುಟ್ಟಿದ ಗರ್ಭಿಣೀ ಅವಧಿ	

ಡಿ. ತಾಯಿಯ ತಕ್ಷಣ ಪ್ರತಿಕೂಲ ಪರಿಣಾಮಗಳು

೧೭	**ತಾಯಿಯ ತಕ್ಷಣ ಪ್ರತಿಕೂಲ ಹುಟ್ಟಿದ ಪರಿಣಾಮಗಳು** ೧. ಪೋಸ್ಟ್ ಪಾರ್ಟಂ ಹೀಮೋರೇಜ್ ಹೌದು ಇಲ್ಲ ೨. ರಕ್ತ ಸಂಚಯ ಹೌದು ಇಲ್ಲ	

डेटा संग्रहासाठीचा प्रयोगपत्र

ए सामाजिक-जनसांख्यिकी माहिती

क्रमांक	**कोडे सहित परिमाण**	**प्रतिसादित कोड**
१.	नाव, पत्ता, आयपी नंबर	
२.	आईचे वय	
३ .	**धर्म** हिंदू २. मुस्लिम ३. इतर ………	
४.	**मातृची शिक्षण स्तरे** १. निरक्षर २ . प्राथमिक ३ . माध्यमिक ४. पूर्व विद्यापीठाचा कोर्स ५. स्नातक ६.पोस्ट-स्नातक	
५.	**स्त्रीचे व्यवसाय** १. घरगुती २ . कृषी ३ . खासगी सेवा ४.सरकारी सेवा ५. इतर………	
६.	**निवासस्थान** १ . शहरी २. अर्धशहरी ३ . ग्रामीण	
७	**विवाहाचा प्रकार** संसंगी विवाह २. असंसंगी विवाह	
८	**आहार तंत्रज्ञान** शुद्ध शाकाहारी शाकाहारी अंड्याचा सेवन करतात ३ . मिश्रित आहार (शाकाहारी आणि मांसाहारी)	
९	**धूम्रपान अभ्यास** १. होय २. नाही	
१०	**दारू पिणे चाळण** होय नाही	
११	भारतीय रुपयात मासिक कुटुंबीय आय…….	

बी. गर्भावस्था संबंधित माहिती

१२	गर्भावस्थेची माहिती: पॅरिटी…….	
१३	आपल्या गर्भावस्थेच्या दरम्यान केलेले ए.एन.सी. भेटीचे एकूण…….	
१४.	प्रसूतीच्या वेळी हीमोग्लोबिन स्तर…….	
१५.	परिस्थिती वगळण १. होय २. नाही	

सी नवजातीचे प्रत्यक्ष अनिष्ट परिणाम

१६.	**नवजातीच्या तात्पुरत्या अनिष्ट गर्भावस्थेचे परिणाम** १ .जन्माची अस्फीक्षिआ: १. १ होय १. २ नाही २. जन्माचा वजन ………… ३ .जन्माची गर्भावस्था …………	

डी मातृत्वावर तात्पुरते अनिष्ट गर्भावस्थेचे परिणाम

१७.	मातृत्वावर तात्पुरते अनिष्ट जन्माचे परिणाम १. पोस्ट पार्टम हेमरेज: १. १. होय १. २ नाही २. रक्त संचयन: २.1. होय २. २. नाही	

ANNEXURE VI

Outcomes of high vaginal swab cultures report of mothers admitted to labour and postnatal ward in selected tertiary care hospital. (Pre and post culture reports)

Name of the mothers:
IP Number:
Date and time of admission:

SN	Name of organism growth/ non growth (pre -test)	Yes	No	Remarks
1	Entero cocci			
2	S. pyogenes			
3	S aurem			
4	Klebsiella			
5	E. coli			
6	Proteus			
7	C. albicans			
8	Non albicans			
Post test				
SN	**Name of organism growth /non growth**	**Yes**	**No**	**Remarks**
	Entero cocci			
	S. pyogenes			
	S aurem			
	Klebsiella			
	E. coli			
	Proteus			
	C. albicans			
	Non albicans			

ಆಯುಕ್ತ ತೃತೀಯ ಆರೋಗ್ಯ ಕೇಂದ್ರದ ಆರೋಗ್ಯಶಾಲೆಯಲ್ಲಿ ಶ್ರಮಿಕೆ ಮತ್ತು ಪೋಸ್ಟ್ನೇಟಲ್ ವಾರ್ಡ್‌ಗೆ ಪ್ರವೇಶಿಸಿದ ತಾಯಂದಿರ ಹೈ ವ್ಯಾಜಿನಲ್ ಸ್ವಾಬ್ ಕಲ್ಚರ್‌ಗಳ ಪರಿಣಾಮಗಳು (ಕಲ್ಚರ್ ಮುಂದು ಮತ್ತು ನಂತರದ ವರದಿಗಳು).

ತಾಯಂದಿರ ಹೆಸರು:
ಇನ್-ಪೇಶೆಂಟ್ ಸಂಖ್ಯೆ:
ಪ್ರವೇಶದ ದಿನಾಂಕ ಮತ್ತು ಸಮಯ:

ಸಿರಿಯಲ್ ಸಂಖ್ಯೆ	ಸಸ್ಯ/ಅಸಸ್ಯತೆ ಸಸ್ಯಗಳ ಹೆಸರು (ಪೂರ್ವ ಪರೀಕ್ಷೆ	ಹೌದು	ಇಲ್ಲ	ಟೀಕೆಗಳು
೧	ಎಂಟೆರೊಕಾಕಸ್ಸಾಯಿ			
೨	ಎಸ್. ಪೈಯೊಜೀನ್ಸ್			
೩	ಎಸ್. ಔರಿಯಸ್			
೪	ಕ್ಲೆಬ್ಸಿಯೆಲಾ			
೫	ಈ. ಕೋಲೈ			
೬	ಪ್ರೊಟಿಯುಸ್			
೭	ಸಿ. ಆಲ್ಬಿಕ್ಯಾನ್ಸ್			
೮	ಅಲ್ಬಿಕನ್ಸ್ ಅಲ್ಲದ			
ಪೋಸ್ಟ್-ಟೆಸ್ಟ್				
ಸಿರಿಯಲ್ ಸಂಖ್ಯೆ	ಸಸ್ಯ/ಅಸಸ್ಯತೆ ಸಸ್ಯಗಳ ಹೆಸರು	ಹೌದು	ಇಲ್ಲ	ಟೀಕೆಗಳು
೧	ಎಂಟೆರೊಕಾಕಸ್ಸಾಯಿ			
೨	ಎಸ್. ಪೈಯೊಜೀನ್ಸ್			
೩	ಎಸ್. ಔರಿಯಸ್			
೪	ಕ್ಲೆಬ್ಸಿಯೆಲಾ			
೫	ಈ. ಕೋಲೈ			
೬	ಪ್ರೊಟಿಯುಸ್			
೭	ಸಿ. ಆಲ್ಬಿಕ್ಯಾನ್ಸ್			
೮	ಅಲ್ಬಿಕನ್ಸ್ ಅಲ್ಲದ			

प्रजनन आणि जन्मानंतर वॉर्डमध्ये प्रवेश केलेल्या आईच्या उच्च व्ह्याजिनल स्वॅब कल्चरच्या प्रतिबिंबिंच्या परिणाम. (कल्चरची पूर्व आणि पुढे प्रतिबिंबिंची अहवाल)

आईच्या नावे;
आयपी क्रमांक:
प्रवेशाची तारीख आणि वेळ:

क्रमांक	संजीव नाव संवर्धन / असंवर्धन (पूर्व-चाचणी)	हो	नाही	टिप्पण्या
१	एंटेरोकोकसायि			
२	एस. पायोजेन्स			
३	एस. औरयिस			
४	क्लेब्सियेला			
५	ई. कोलाय			
६	प्रोटीयस			
७	सी. आल्बिकन्स			
८	अल्बिकन्स बाहेरील			
पोस्ट चाचणी				
क्रमांक	संजीव नाव संवर्धन / असंवर्धन (पोस्ट चाचणी)	हो	नाही	टिप्पण्या
१	एंटेरोकोकसायि			
२	एस. पायोजेन्स			
३	एस. औरयिस			
४	क्लेब्सियेला			
५	ई. कोलाय			
६	प्रोटीयस			
७	सी. आल्बिकन्स			
८	अल्बिकन्स बाहेरील			

ANNEXURE VII

Outcomes of high vaginal swab cultures report of mothers admitted to labour and postnatal ward in selected tertiary care hospital. (Pre and post culture reports)

Name of the mothers:
IP Number:
Date and time of admission:

CARE BUNDLE	DATE			DATE			DATE			DATE			DATE			DATE			DATE			
PERINEAL CARE	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	
ASEPTIC TECHNIQUE																						
USE OF 5% BETADINE																						
NORMAL SALINE																						
STERILE GLOVES																						
CHANGE STERILE PADS																						
HAND HYGINE																						
S/N NAME																						
STAFF NAME AND SIGNATURE																						

ANNEXURE VIII

KLES DR.PRABHAKAR KORE HOSPITAL AND MRC
PERINEAL CARE BUNDLE SHEET

PATIENT NAME: IP NO: DIAGNOSIS: AGE : DIAGNOSIS:

WARD DATE OF ADMISSION: DATE OF Admission:

ASSESSMENT OF WOUND WITH REEDA SCALE

Scores Components	0	1	2	3	Score Obtained
Redness	None	With 0.25 cm of incision bilaterally	Within 0.50 cm of incision bilaterally	Beyond 0.50 cm of incision bilaterally	
Edema	None	Perineal, less than 1 cm from incision	Perineal and vulvar, between 1 – 2 cm from incision	Perineal and or vulvar, greater than 2cm from incision.	
Ecchymosis	None	Within 0.25 cm of incision bilaterally or 0.25 cm unilaterally	Between 0.25- 1 cm incision bilaterally or 0.5- 2cm unilaterally	Greater than 1 cm bilaterally or 2cm unilaterally.	
Discharge	None	Serum	Serosanguineous	Bloody, purulent	
Approximation	None	Skin separation 3 cm or less.	Skin and subcutaneous fat separation.	Skin Subcutaneous fat and facial layer separation.	

Obtained Score:

INTERPRETATION:

Total score: 15

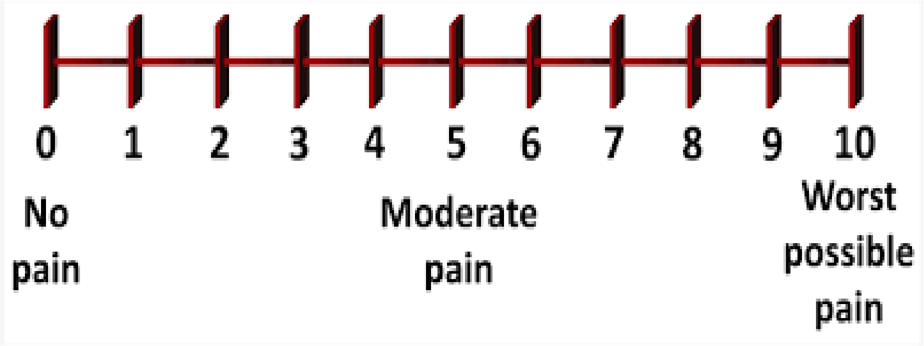
Mild Inflammation: 0-5

Moderate Inflammation: 6-10

Severe Inflammation: 11-15

ANNEXURE IX

ASSESSMENT OF PAIN WITH VAS (Visual Analogue Scale)



INTERPRETATION:

No pain: 0

Mild pain: 1-3

Moderate pain: 4- 7

Worst pain: 8- 10

ANNEXURE X: CERTIFICATES

Bharati Vidyapeeth (Deemed to be University), Pune
Ministry of Human Resource Development, Govt. of India
'A' Grade University Status
Re-accreditedby NAAC with 'A+' Grade

Estd. 1964
Celebrating
and Beyond
BHARATI VIDYAPEETH
Founder Hon. Dr.Patangrao Kadam

COLLEGE OF NURSING, SANGLI.

Certificate of Participation

This is to certify that,

Dr./~~Mr.~~/~~Ms.~~/Mrs. Jaya koirala from KLE CON, Belagavi has participated as **Delegate / Paper Presentor / Poster Presenter / Evaluator / Resource Person** in International Conference on **"Emerging Competencies in Midwifery & Neonatal Practices : The Nursing Perspective"** organized by Bharati Vidyapeeth (Deemed to be University), College of Nursing, Sangli, heldon11th& 12thJanuary 2023.

Dr. (Mrs.) Vijaya Kumbhar
Organising Secretary.
BVDU,CON, Sangli.

Dr. (Mrs). Nilima R. Bhore
Dean Faculty of Nursing & Principal
Organising Chairperson BVDU,CON,Sangli

Dr. H. M. Kadam
Honorary Regional Director
Bharati Vidyapeeth Regional Office, Sangli.

KLE
EMPOWERING PROFESSIONALS

KLES
DR. PRABHAKAR KORE HOSPITAL
&
MEDICAL RESEARCH CENTRE
NEHRU NAGAR, BELAGAVI-590010

Jawaharlal Nehru Medical College

(A Constituent Unit of KLE Academy of Higher Education & Research)
(Deemed-to-be University)
Accredited A+ Grade by NAAC (3rd Cycle) & Placed in Category 'A' by MHRD (GoI)

This is to certify that

DR JAYA KORIALA

has participated & presented a ***Paper / Poster entitled***

"Socio-economic Determinants of Immediate Adverse Pregnancy outcomes- A Hospital Based study"

in the **41st JNMC Scientific Society Annual CME - 2023,**
organized by KAHER's J. N. Medical College, Belagavi, held on 8th & 9th April 2023

Dr. (Mrs.) N. S. Mahantashetti
President
41st JNMC Scientific Society Annual CME 2023

Dr. Anita Dalal
Organising Chairperson
41st JNMC Scientific Society Annual CME 2023

Dr. M. B. Bellad
Organising Chairperson
Scientific Committee

Dr. Shantala Herlekar
Scientific Society Secretary

Dr. Swapnil Pattanshetti
Scientific Society Secretary

41st JNMC
SCIENTIFIC SOCIETY ANNUAL CME
THEME : WOMENS HEALTH - NEWER PERSPECTIVES IN EVERY DAY PRACTICE
8th & 9th April 2023

ANNEXURE -XI

PUBLICATIONS

Origi J Nepal Health Res Counc 2022 Apr-Jun;20(55):464-74

Maternal Anemia and BMI as Determinants of Pregnancy Outcomes: A Hospital-Based Study

Jaya Koirala,[1] Sudha. A Raddi,[1] Anita Dadi Dalal[1]

[1]KLE Academy of Higher Education and Research (KAHER) Institute of Nursing Sciences, Belagavi, Karnataka, India.

ABSTRACT

Background: Malnutrition is a serious underlying cause of child and maternal deaths around the world. The objective of this study evaluates maternal anemia and body mass index as determinants of pregnancy outcomes. Undernourishment during pregnancy can occurs Intra Uterine Growth Retardation. Contributing to about 80,0000 new-borns, 40,0000 infant deaths and 20% under 2 years children have stunted, 20% of maternal deaths during labor and early postpartum.

Methods: This study Hospital-based cross-sectional study. The study comprised laboring women admitted for delivery in selected tertiary care hospital in South India from 10th November 2021 to 20th January 2022. Structured interview schedule for demographic information, patient's case sheet for information about the 'Body Mass Index as a determinants of pregnancy outcomes' and anthropometric measurement for body mass index (weight and height). All registered deliveries in the study period have been included, comprising of 101 sample size Bivariate logistic regressions were used to determine the factors associated with outcome variables. A significant level of 5% was used to decide the significance of statistical tests.

Results: Body Mass Index in the 1st antenatal visit of the women who came for delivery in tertiary care hospital, underweight 36.6%, normal body mass index 52.5%, and overweight 10.9%. During 1st antenatal visit 58.4% had anemia, while 53.5% had mild anemia during the last antenatal visit. Respectively 39.6% of antenatal women had normal Hb% during 1st antenatal care visit, whereas 46.5% had normal Hb%, during their last antenatal visit. The mode of delivery; spontaneous vaginal delivery 45.5%, vacuum delivery 3.0%, emergency caesarean section delivery 50.5%. Preterm delivery was statistically significant among whose first antenatal care visit was after 11th weeks of gestation. Whereas, emergency caesarean section delivery was statistically significant among underweight. Increasing maternal weight body mass index was associated with maternal and neonatal health outcomes. Which was risk of pregnancy induced hypertension, preeclampsia, eclampsia, gestational diabetes mellitus and caesarean section delivery.

Conclusions: Every 2nd women was anemic, every 3rd pregnant women was underweight (BMI >18.5), every 2nd baby was born with caesarean section delivery. Preterm delivery was statically significant of weeks of gestation during first antenatal care visit with more than 11th weeks of gestation. Whereas, emergency cesarean section was significant with low body mass index.

Keywords: Anemia; body mass index; caesearn section delivery; low birth weight; preterm delivery

INTRODUCTION

Globally 1.62 billion women are suffering from anemia.[1] According to WHO, 1993 to 2005 data, 32 million (38%) pregnant women are anemic, of whom 750,000 are severely anemic (hemoglobin level <7.0/dl).[2] The majority of anemic pregnant women, in low-income and middle-income countries, are 43% which is the highest prevalence found in Southern Asia 52%, Central African and West African countries 56%.[3,4] Anemia is a major consequence for women's health as well as socio-economic development which results in the loss of billions of dollars annually. [1,5,6] The prevalence of anemia in pregnant women in developed countries are14%, in developing countries 51%, and in India, it varies from 65% to 75%. [7,8]

Complications of maternal obesity (BMI>25 kg/m^2) including gestational hypertension, preeclampsia, macrosomia, early induction of labor and need for

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caesarean section deliveries and currently apply upmost but also concede increasingly in middle-income countries, including India.[9]

While, in the countryside of India, undernutrition (BMI<18.5 kg/m^2) is associated with low birth weight (LBW< 2.5 kg) and preterm deliveries.

METHODS

The purpose of the study has been already explained to women before the data collection, and written informed consent was obtained from every subject. For socio-demographic, socio-economic condition structured interview schedule techniques were used. For the maternal and newborn pregnancy outcomes information patient case sheet was used. For BMI every subject had taken weight and height and for previous (first antenatal clinic visit) weight and height patient's case sheet had used. The total number of samples were 101. Date was collected from 10th November 2021 to 20th January 2022. Ethical clearance was obtained from the ethical review committee of KLE Academy of Higher Education and Research (KAHER), to conduct the study.

The collected data was entered in MS Excel-2016 and exported in SPSS- version 20 for analysis. Data has been checked for consistency and completeness by exploratory data analysis before running the statistical analysis. Univariate and bi-variate were used to see the distribution of the study subjects by outcome variables (low birth weight, preterm delivery, and mode of delivery). Bivariate logistic regressions were used to determine the factors associated with outcome variables. A significant level i.e; 5%, was used to decide the significance of statistical tests.

Data quality was ensured in collection, coding, entry, and analysis. Structured Interview Schedule and patient case sheet, each case information was checked for its consistency, provision of full information and apposite documents.

RESULTS

Table 1 shows that, the preterm delivery was 33.3% and 14.3% among women of age group <25 years respectively. The preterm delivery was 37.5% and 26.1% in women who were vegetarian and mixed diet respectively. The preterm delivery was 44.4%in women who were vegetarian (consume egg). Respectively, the preterm delivery was 44.4%, 27.2% among women who visited the total number of ANC visit ≤ 4 times and >5 times respectively (Table 1).

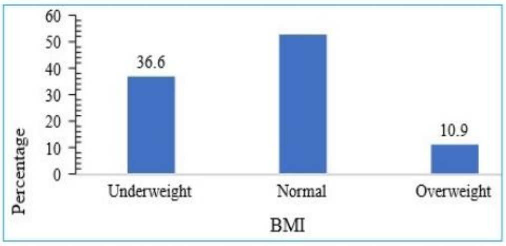


Figure 1. Body Mass Index (BMI) Level (n=101).

Figure 1. shows that, findings of the study of Body Mass Index (BMI) in the first antenatal visit of the women, underweight 36.6%, normal BMI 52.5% and overweight 10.9% (Figure 1).

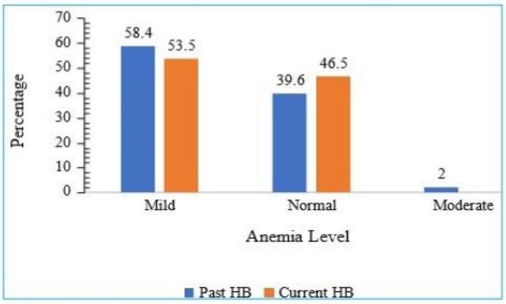


Figure 2. HB Level (n=101).

Figure 2. shows that, the percentage of mild anemia was 58.4% and 53.5% in 1st antenatal visit and last antenatal visit respectively. Likewise, normal Hb level was 39.6% and 46.5% during 1st and last antenatal visit respectively. Moderate anemia was 2.0% during 1st antenatal visit. (Figure 2).

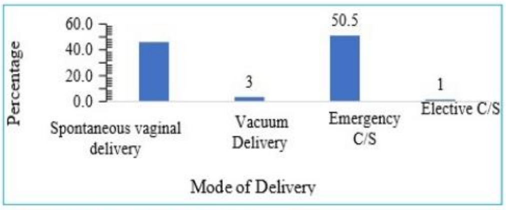


Figure 3. Mode of delivery (n=101)

Figure 3. shows that, the mode of delivery; spontaneous vaginal delivery was 45.5%, vacuum delivery was 3.0%, emergency caesarean section (C/S) 50.5% and elective cesarean section (C/S) 1.0% (Figure 3).

Table 1. Shows that, socio-demographic and socio-economic information about the women who were participated in this study (Table 1).

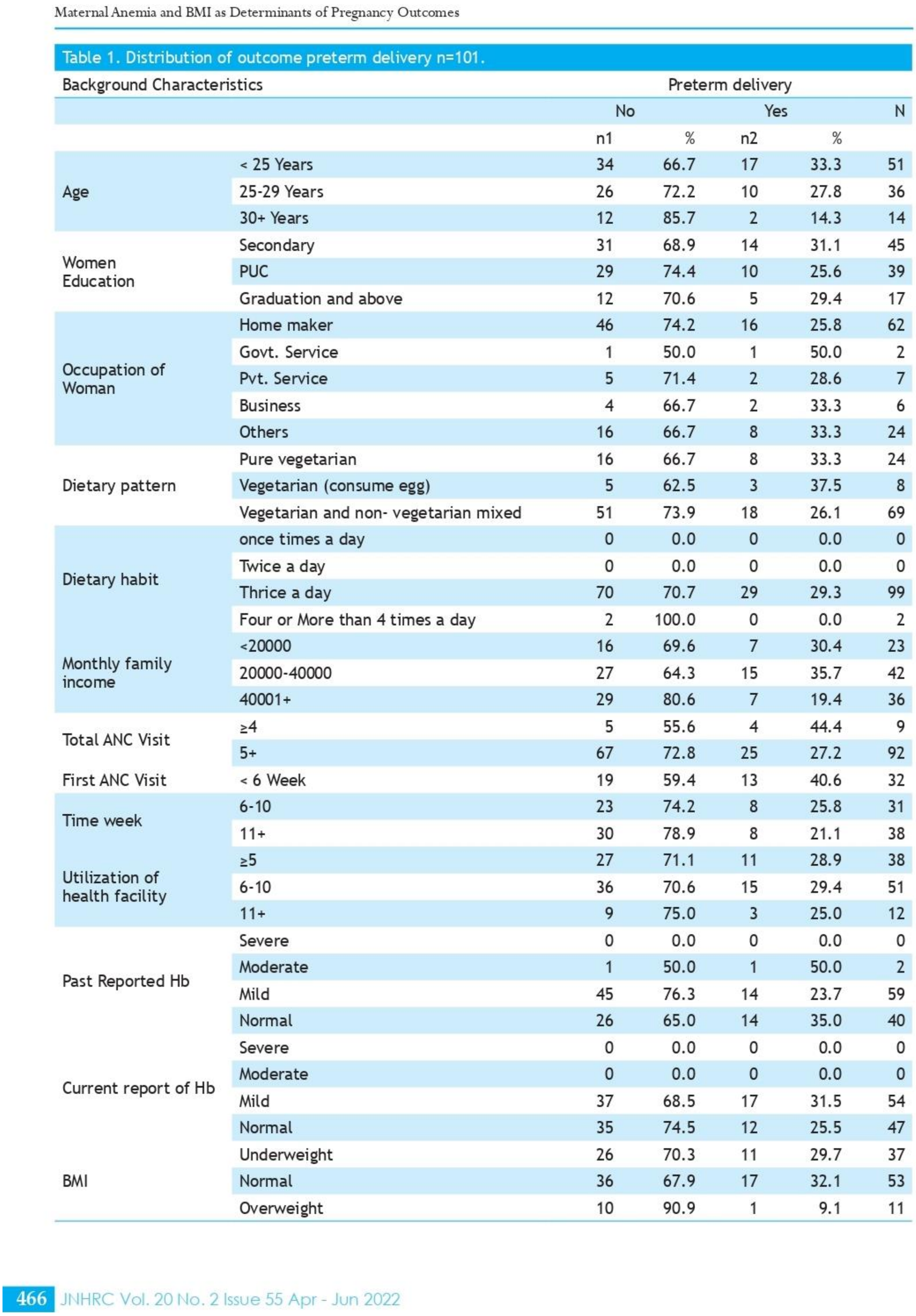


Table 1. Distribution of outcome preterm delivery n=101.

Background Characteristics		Preterm delivery				
		No		Yes		N
		n1	%	n2	%	
Age	< 25 Years	34	66.7	17	33.3	51
	25-29 Years	26	72.2	10	27.8	36
	30+ Years	12	85.7	2	14.3	14
Women Education	Secondary	31	68.9	14	31.1	45
	PUC	29	74.4	10	25.6	39
	Graduation and above	12	70.6	5	29.4	17
Occupation of Woman	Home maker	46	74.2	16	25.8	62
	Govt. Service	1	50.0	1	50.0	2
	Pvt. Service	5	71.4	2	28.6	7
	Business	4	66.7	2	33.3	6
	Others	16	66.7	8	33.3	24
Dietary pattern	Pure vegetarian	16	66.7	8	33.3	24
	Vegetarian (consume egg)	5	62.5	3	37.5	8
	Vegetarian and non- vegetarian mixed	51	73.9	18	26.1	69
Dietary habit	once times a day	0	0.0	0	0.0	0
	Twice a day	0	0.0	0	0.0	0
	Thrice a day	70	70.7	29	29.3	99
	Four or More than 4 times a day	2	100.0	0	0.0	2
Monthly family income	<20000	16	69.6	7	30.4	23
	20000-40000	27	64.3	15	35.7	42
	40001+	29	80.6	7	19.4	36
Total ANC Visit	≥4	5	55.6	4	44.4	9
	5+	67	72.8	25	27.2	92
First ANC Visit	< 6 Week	19	59.4	13	40.6	32
Time week	6-10	23	74.2	8	25.8	31
	11+	30	78.9	8	21.1	38
Utilization of health facility	≥5	27	71.1	11	28.9	38
	6-10	36	70.6	15	29.4	51
	11+	9	75.0	3	25.0	12
Past Reported Hb	Severe	0	0.0	0	0.0	0
	Moderate	1	50.0	1	50.0	2
	Mild	45	76.3	14	23.7	59
	Normal	26	65.0	14	35.0	40
Current report of Hb	Severe	0	0.0	0	0.0	0
	Moderate	0	0.0	0	0.0	0
	Mild	37	68.5	17	31.5	54
	Normal	35	74.5	12	25.5	47
BMI	Underweight	26	70.3	11	29.7	37
	Normal	36	67.9	17	32.1	53
	Overweight	10	90.9	1	9.1	11

Table 2. Distribution of outcome low birth weight in KG n=101.

Background Characteristics		Low birth weight in Kg				
		No		Yes		n
		n1	%	n2	%	
Age	< 25 Years	35	68.6	16	31.4	51
	25-29 Years	27	75.0	9	25.0	36
	30+ Years	12	85.7	2	14.3	14
Women Education	Secondary	30	66.7	15	33.3	45
	PUC	31	79.5	8	20.5	39
	Graduation and above	13	76.5	4	23.5	17
Occupation of Woman	Home maker	43	69.4	19	30.6	62
	Govt. Service	1	50.0	1	50.0	2
	Pvt. Service	6	85.7	1	14.3	7
	Business	6	100.0	0	0.0	6
	Others	18	75.0	6	25.0	24
Dietary pattern	Pure vegetarian	16	66.7	8	33.3	24
	Vegetarian (consume age)	5	62.5	3	37.5	8
	Vegetarian and non- vegetarian mixed	53	76.8	16	23.2	69
Dietary habit	once times a day	0	0.0	0	0.0	0
	Twice a day	0	0.0	0	0.0	0
	Thrice a day	72	72.7	27	27.3	99
	≥ 4 times a day	2	100.0	0	0.0	2
Monthly family income	<20000	17	73.9	6	26.1	23
	20000-40000	30	71.4	12	28.6	42
	40001+	27	75.0	9	25.0	36
Total ANC Visit	≤ 4	7	77.8	2	22.2	9
	5+	67	72.8	25	27.2	92
First ANC Visit Time Week	< 6 Week	22	68.8	10	31.3	32
	6-10	22	71.0	9	29.0	31
	11+	30	78.9	8	21.1	38
Utilization of health facility	≤ 5	29	76.3	9	23.7	38
	6-10	37	72.5	14	27.5	51
	11+	8	66.7	4	33.3	12
Past reported Hb%	Severe	0	0.0	0	0.0	0
	Moderate	2	100.0	0	0.0	2
	Mild	42	71.2	17	28.8	59
	Normal	30	75.0	10	25.0	40
Current Reported Hb %	Severe	0	0.0	0	0.0	0
	Moderate	0	0.0	0	0.0	0
	Mild	41	75.9	13	24.1	54
	Normal	33	70.2	14	29.8	47
BMI	Underweight	27	73.0	10	27.0	37
	Normal	36	67.9	17	32.1	53
	Overweight	11	100.0	0	0.0	11

Table 2 shows, that, the percentage of low birth weight babies were 31.4% and 14.3% among women of age group <25 years and >30 years respectively. The percentage of low birth weight was 37.5% and 23.2% in women who consume vegetarian and mixed diet respectively. (Table 2).

The percentage of low birth weight babies were 29.8%, 24.1% in women who had Hb % normal and who were mild anemic respectively in current Hb% normal. The percentage of low weight babies were 32.1%, 27.0% in women who had normal BMI and underweight (BMI>18.5) respectively (Table 2).

Table 3 shows that, the percentage of spontaneous vaginal delivery was 47.1% and 64.3% among women of age group <25 years and >30 years respectively. The percentage of caesarean section delivery was 53% and 28.6% among women of age group <25 years and > 30 years respectively. The percentage of spontaneous vaginal delivery was 58.3% and 59.5% among women whose family monthly income was Rs. 4000 or more than 40001 and Rs 20000- 40001 in Indian currency respectively (Table 3).

Table 4; shows that, preterm delivery was 5.82 times higher in the pregnant women of age group <25 years than >30 years. Low birth weight was 3.56 times higher in women <25 years of age group, while emergency cesarean section was 4.93 times higher than the women >30 years of age group. Likewise, emergency cesarean section was 2.99 times higher in women <25 years of age group. (Table 4).

Table 5; shows that, emergency cesarean section delivery was higher in PUC level of education women than secondary, graduate and above graduate level of education women. Preterm delivery was 10.21 times higher in women who had government service holder than women who had home maker, private service holder, business and other occupation women. Emergency caesarean section was 5 times higher in women who had occupation of business than women who were home maker. Emergency C/S delivery was statistically significant among underweight (BMI> 18.5) women, whereas preterm delivery was statistically significant among women who visit ANC for the 1st time after 11th weeks of gestation (Table 5).

Table 6; shows that, preterm delivery was 2.24 times higher in rural women than in urban women. Low birth weight was 1.53 times higher in rural women than in urban women. Emergency C/S delivery was 3.01 times higher in semi-urban women than in urban women. Preterm delivery, low birth weight and emergency C/S delivery were higher in women who had problem of preeclampsia in primi para women than multi para. While preterm delivery was 7.45 times higher in women who had problem of eclampsia with primi para women. Emergency C/S delivery was 3.14 times higher in women who had no history of gestational diabetes mellitus than women who had gestational diabetes mellitus. Low birth weight was 1.45 times higher in women who had one time abortion history than in women who had no abortion history, emergency caesarean section delivery was higher in women who had history of one time abortion than women who had no history of abortion. Low birth weight was 7.69 times higher in women who were in 4th gravida than women who were in 1st gravida, similarly emergency caesarean section was 14.17 times higher in women who were 4th gravida than women who were 1st gravida (Table 6).

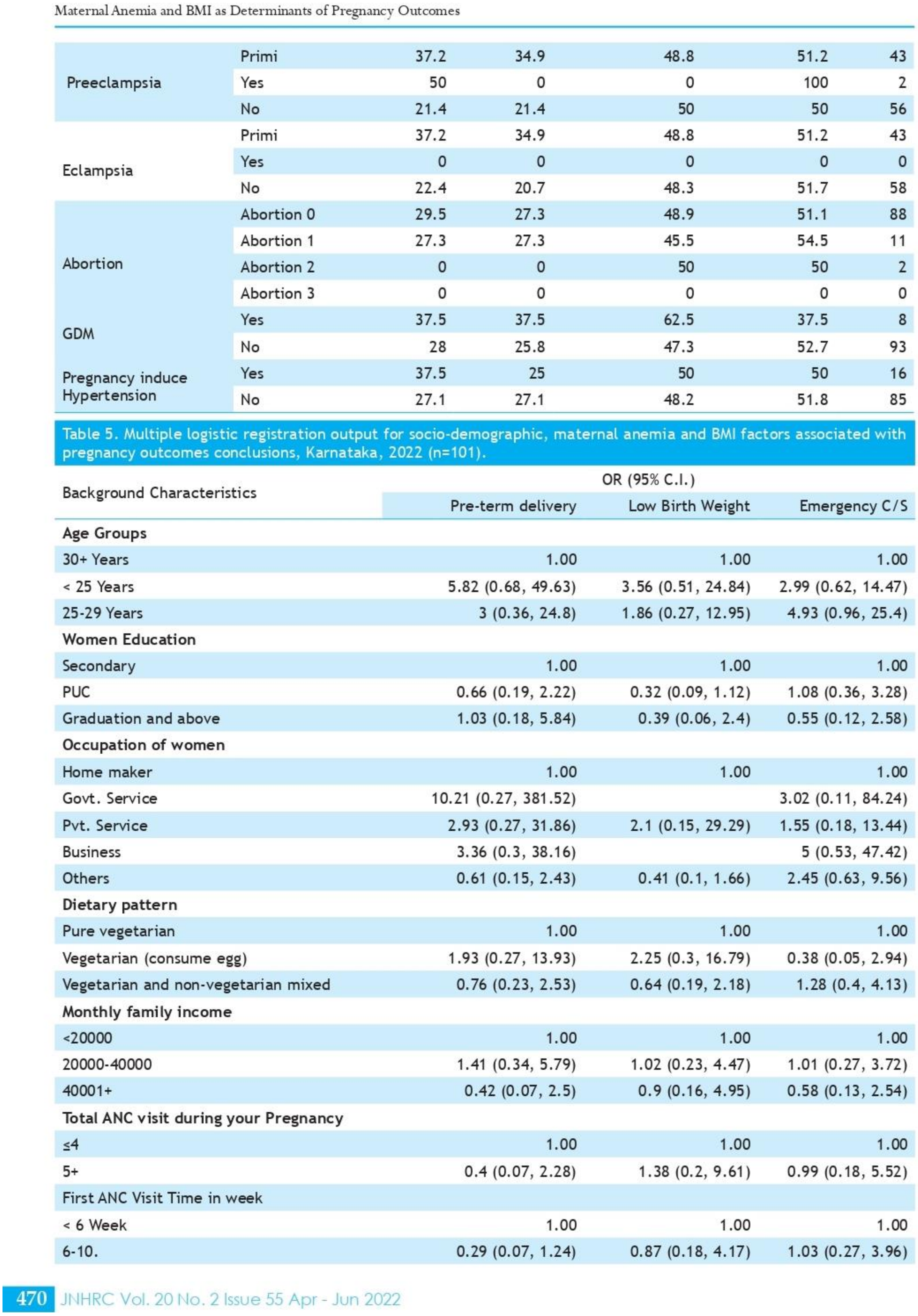
Table 3.Distribution of outcomes (Mode of delivery) (spontaneous vaginal delivery, vacuum delivery and emergency Caesarean Section C/S) delivery) n-101.

Background Characteristics		Mode of delivery						
		Spontaneous vaginal Delivery		Instrumental delivery (Vacuum)		Emergency C/S		n
		n1	%	n2	%	n3	%	
Age	< 25 Years	24	47.1	0	0	27	53	51
	25-29 Years	13	36.1	2	5.6	21	58.3	36
	30+ Years	9	64.3	1	7.1	4	28.6	14
Women Education	Secondary	19	42.2	1	2.2	25	55.5	45
	PUC	17	43.6	2	5.1	20	51.3	39
	Graduation and above	10	58.8	0	0	7	41.2	17
Occupation of Woman	Home maker	32	51.6	1	1.6	29	46.8	62
	Govt. Service	1	50	0	0	1	50	2
	Pvt. Service	3	42.9	1	14.3	3	42.9	7
	Business	2	33.3	0	0	4	66.7	6
	Others	8	33.3	1	4.2	15	62.5	24

Dietary pattern	Pure vegetarian	13	54.2	0	0	11	45.9	24
	Vegetarian (consume age)	4	50	1	12.5	3	37.5	8
	Vegetarian and non- vegetarian mixed	29	42	2	2.9	38	55.1	69
Dietary habit	once times a day	0	0	0	0	0	0	0
	Twice a day	0	0	0	0	0	0	0
	Thrice a day	44	44.4	3	3	52	52.5	99
	Four or More than 4 times a day	2	100	0	0	0	0	2
Monthly family income	<20000	11	47.8	0	0	12	52.2	23
	20000-40000	14	33.3	3	7.1	25	59.5	42
	40001+	21	58.3	0	0	15	41.7	36
Total ANC Visit	≤4	3	33.3	1	11.1	5	55.6	9
	5+	43	46.7	2	2.2	47	51.1	92
First ANC Visit Time Week	< 6 Week	15	46.9	0	0	17	53.1	32
	6-10	11	35.5	2	6.5	18	58.1	31
	11+	20	52.6	1	2.6	17	44.7	38
Utilization of health facility	≤5	15	39.5	3	7.9	20	52.6	38
	6-10	22	43.1	0	0	29	56.9	51
	11+	9	75	0	0	3	25	12
Past reported Hb%	Severe	0	0	0	0	0	0	0
	Moderate	1	50	0	0	1	50	2
	Mild	28	47.5	0	0	31	52.5	59
	Normal	17	42.5	3	7.5	20	50	40
Current reported Hb%	Severe	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0
	Mild	30	55.6	0	0	24	44.4	54
	Normal	16	34	3	6.4	28	59.5	47
BMI	Underweight	20	54.1	1	2.7	16	43.2	37
	Normal	19	35.8	1	1.9	33	62.3	53
	Overweight	7	63.6	1	9.1	3	27.3	11

Table 4. Distribution of outcomes (Mode of delivery) (spontaneous vaginal delivery, vacuum delivery and emergency Caesarean Section (C/S) delivery) (n=101).

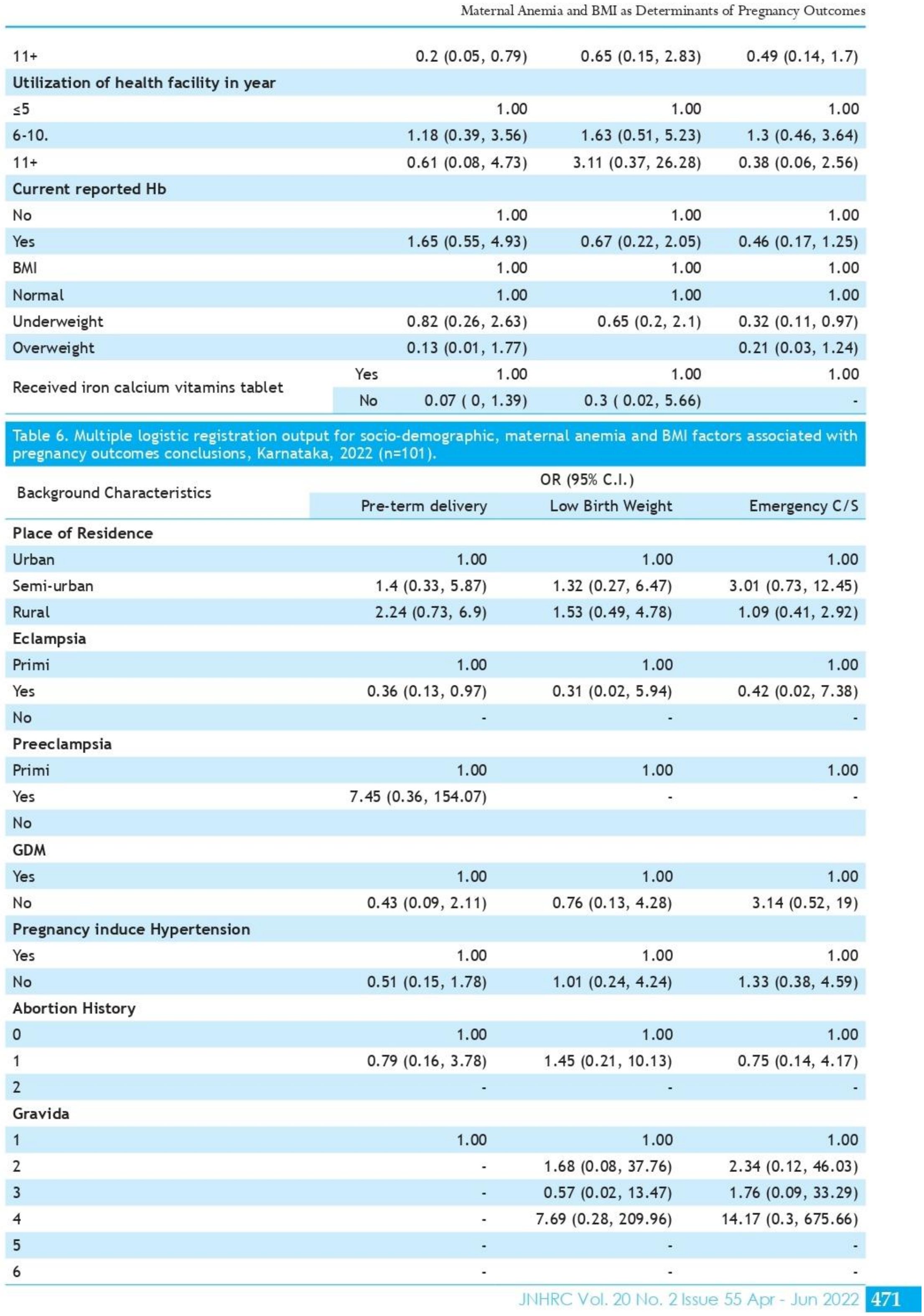
Background Characteristics		Preterm delivery	Low birth weight	Spontaneous vaginal delivery	Emergency C/S	n
Residence	Urban	21.9	21.9	53.1	46.9	32
	Semi urban	26.3	26.3	26.3	73.7	19
	Rural	34	30	54	46	50
Parity	Primi Para	31.1	31.1	48.9	51.1	45
	Low parity	24	20	50	50	50
	Multi Para	50	50	33.3	66.7	6
Gravida	G1	33.3	33.3	50	50	42
	G2	23.3	23.3	53.3	46.7	30
	G3	19	9.5	47.6	52.4	21
	G4	66.7	66.7	16.7	83.3	6
	G5	0	0	0	100	1
	G6	0	0	100	0	1



Preeclampsia	Primi	37.2	34.9	48.8	51.2	43
	Yes	50	0	0	100	2
	No	21.4	21.4	50	50	56
Eclampsia	Primi	37.2	34.9	48.8	51.2	43
	Yes	0	0	0	0	0
	No	22.4	20.7	48.3	51.7	58
Abortion	Abortion 0	29.5	27.3	48.9	51.1	88
	Abortion 1	27.3	27.3	45.5	54.5	11
	Abortion 2	0	0	50	50	2
	Abortion 3	0	0	0	0	0
GDM	Yes	37.5	37.5	62.5	37.5	8
	No	28	25.8	47.3	52.7	93
Pregnancy induce Hypertension	Yes	37.5	25	50	50	16
	No	27.1	27.1	48.2	51.8	85

Table 5. Multiple logistic registration output for socio-demographic, maternal anemia and BMI factors associated with pregnancy outcomes conclusions, Karnataka, 2022 (n=101).

Background Characteristics	OR (95% C.I.)		
	Pre-term delivery	Low Birth Weight	Emergency C/S
Age Groups			
30+ Years	1.00	1.00	1.00
< 25 Years	5.82 (0.68, 49.63)	3.56 (0.51, 24.84)	2.99 (0.62, 14.47)
25-29 Years	3 (0.36, 24.8)	1.86 (0.27, 12.95)	4.93 (0.96, 25.4)
Women Education			
Secondary	1.00	1.00	1.00
PUC	0.66 (0.19, 2.22)	0.32 (0.09, 1.12)	1.08 (0.36, 3.28)
Graduation and above	1.03 (0.18, 5.84)	0.39 (0.06, 2.4)	0.55 (0.12, 2.58)
Occupation of women			
Home maker	1.00	1.00	1.00
Govt. Service	10.21 (0.27, 381.52)		3.02 (0.11, 84.24)
Pvt. Service	2.93 (0.27, 31.86)	2.1 (0.15, 29.29)	1.55 (0.18, 13.44)
Business	3.36 (0.3, 38.16)		5 (0.53, 47.42)
Others	0.61 (0.15, 2.43)	0.41 (0.1, 1.66)	2.45 (0.63, 9.56)
Dietary pattern			
Pure vegetarian	1.00	1.00	1.00
Vegetarian (consume egg)	1.93 (0.27, 13.93)	2.25 (0.3, 16.79)	0.38 (0.05, 2.94)
Vegetarian and non-vegetarian mixed	0.76 (0.23, 2.53)	0.64 (0.19, 2.18)	1.28 (0.4, 4.13)
Monthly family income			
<20000	1.00	1.00	1.00
20000-40000	1.41 (0.34, 5.79)	1.02 (0.23, 4.47)	1.01 (0.27, 3.72)
40001+	0.42 (0.07, 2.5)	0.9 (0.16, 4.95)	0.58 (0.13, 2.54)
Total ANC visit during your Pregnancy			
≤4	1.00	1.00	1.00
5+	0.4 (0.07, 2.28)	1.38 (0.2, 9.61)	0.99 (0.18, 5.52)
First ANC Visit Time in week			
< 6 Week	1.00	1.00	1.00
6-10.	0.29 (0.07, 1.24)	0.87 (0.18, 4.17)	1.03 (0.27, 3.96)



11+		0.2 (0.05, 0.79)	0.65 (0.15, 2.83)	0.49 (0.14, 1.7)
Utilization of health facility in year				
≤5		1.00	1.00	1.00
6-10.		1.18 (0.39, 3.56)	1.63 (0.51, 5.23)	1.3 (0.46, 3.64)
11+		0.61 (0.08, 4.73)	3.11 (0.37, 26.28)	0.38 (0.06, 2.56)
Current reported Hb				
No		1.00	1.00	1.00
Yes		1.65 (0.55, 4.93)	0.67 (0.22, 2.05)	0.46 (0.17, 1.25)
BMI		1.00	1.00	1.00
Normal		1.00	1.00	1.00
Underweight		0.82 (0.26, 2.63)	0.65 (0.2, 2.1)	0.32 (0.11, 0.97)
Overweight		0.13 (0.01, 1.77)		0.21 (0.03, 1.24)
Received iron calcium vitamins tablet	Yes	1.00	1.00	1.00
	No	0.07 (0, 1.39)	0.3 (0.02, 5.66)	-

Table 6. Multiple logistic registration output for socio-demographic, maternal anemia and BMI factors associated with pregnancy outcomes conclusions, Karnataka, 2022 (n=101).

Background Characteristics	OR (95% C.I.)		
	Pre-term delivery	Low Birth Weight	Emergency C/S
Place of Residence			
Urban	1.00	1.00	1.00
Semi-urban	1.4 (0.33, 5.87)	1.32 (0.27, 6.47)	3.01 (0.73, 12.45)
Rural	2.24 (0.73, 6.9)	1.53 (0.49, 4.78)	1.09 (0.41, 2.92)
Eclampsia			
Primi	1.00	1.00	1.00
Yes	0.36 (0.13, 0.97)	0.31 (0.02, 5.94)	0.42 (0.02, 7.38)
No	-	-	-
Preeclampsia			
Primi	1.00	1.00	1.00
Yes	7.45 (0.36, 154.07)	-	-
No			
GDM			
Yes	1.00	1.00	1.00
No	0.43 (0.09, 2.11)	0.76 (0.13, 4.28)	3.14 (0.52, 19)
Pregnancy induce Hypertension			
Yes	1.00	1.00	1.00
No	0.51 (0.15, 1.78)	1.01 (0.24, 4.24)	1.33 (0.38, 4.59)
Abortion History			
0	1.00	1.00	1.00
1	0.79 (0.16, 3.78)	1.45 (0.21, 10.13)	0.75 (0.14, 4.17)
2	-	-	-
Gravida			
1	1.00	1.00	1.00
2	-	1.68 (0.08, 37.76)	2.34 (0.12, 46.03)
3	-	0.57 (0.02, 13.47)	1.76 (0.09, 33.29)
4	-	7.69 (0.28, 209.96)	14.17 (0.3, 675.66)
5	-	-	-
6	-	-	-

DISCUSSION

Maternal anemia is an indicator of health and poor nutrition. Two major indicators of maternal nutrition are body mass index (BMI) and anemia, both of which can affect health of a mother and her fetus. In rural India, undernutrition (BMI <18.5 kg/m^2) associated with low birth weight (LBW <2.5 kg) and preterm deliveries (<37 weeks of gestation). Pawalia A et al.[10] However in low and middle income country 56% of pregnant women were suffering from anemia Black RE et al.[11] Therefore this study aimed to evaluate the anemia and BMI as determinants of pregnancy outcomes in South, India.

The study shows that, BMI during first antenatal visit of the women was 36.6% underweight, 58.4% Mild anemia, while during last antenatal visit 53.5% Mild anemia. While, Hb% >7 was 2.0% moderate anemia during first antenatal visit. Similarly, anemia 90% low BMI (18.5<) 35%, and 0.2% severe anemia. Majority of the women suffered from mild anemia than moderate and severe anemia. The risk of caesarean section delivery were significantly higher in non-anemic women than anemic women. While, this study women with anemia were significantly higher risk for C/S delivery, didn't supported the Patel A et al and Kumar A et al.[12,13] Age of the pregnant women and gravida were independently associated with maternal anemia, low birth weight, and preterm delivery, while preterm delivery was significant among women who visited first ANC visit after 11th weeks of gestation, which was supported, Agarwal KN et al.[14] Kumari S et al study maternal anemia was a strongly statistically significant risk for preterm birth than non-anemic women. Whereas, weakly statically significant risk for low birth weight. While, preterm delivery and low birth weight were positive association between each other.[15] Participants were 32% from rural area, whereas in similar study 20% participant were from rural area, Ethiopia CS. Statistical 2004/2005.[16] Mild anemic women were 54.5% during first antenatal visit, which was supported, Bagi- Ansari N et al.[17] Supplementation of iron sulfate, folic acid, calcium and vitamins during current pregnancy did not significantly reduced the incidence of anemia which was supported the Brion MJ et al, Thirukkanesh S et al, Zhang Q et al, Aikawa R et al and Khan DA et al.[18-22] Nutritional status, education, occupation, dietary pattern, and socio-economic status of the women were associated factors of anemia and body mass index which were risk of preterm delivery, low birth weight and emergency caesarean section which was supported, Bodnar LM et al.[23]

Maternal weight was associated with maternal and neonatal health outcomes. Maternal obesity may increase risk of pregnancy induced hypertension, preeclampsia, eclampsia, GDM and cesarean section delivery. Preeclampsia, eclampsia, and gestational diabetes mellitus were risk of low birth weight, preterm delivery and cesarean section delivery. Preterm delivery and low birth weight were high risks of neonatal deaths, while C/S delivery was the risk of maternal mortality, which was supported, James AH et al, Doherty DA et al, and Callaway LK et al.[24-26]

CONCLUSIONS

The combination of anemia and body mass index (BMI) in pregnancy increased the risk of low birth weight, preterm birth, and neonatal mortality. These adverse birth outcomes raise major concerns because national programs to address iron deficiency anemia have not reduced the rates of anemia among rural pregnant women in Karnataka. Meanwhile, seeking simultaneously short-term strategies such as spouse counseling, community awareness program in reproductive health. Reduce or minimize delay in the decision to seek care, delay in identifying, reaching health facilities and delay in receipt of adequate and appropriate treatment to better healthcare service and management of the provision of safe delivery for the segment of pregnant women who are both anemic and underweight could be helpful in reducing neonatal and maternal mortality and morbidity. Such actions are could be helpful in reducing neonatal and maternal mortality and imperative to break the intergenerational cycle of poor growth in the new-born and also for improving child health survival.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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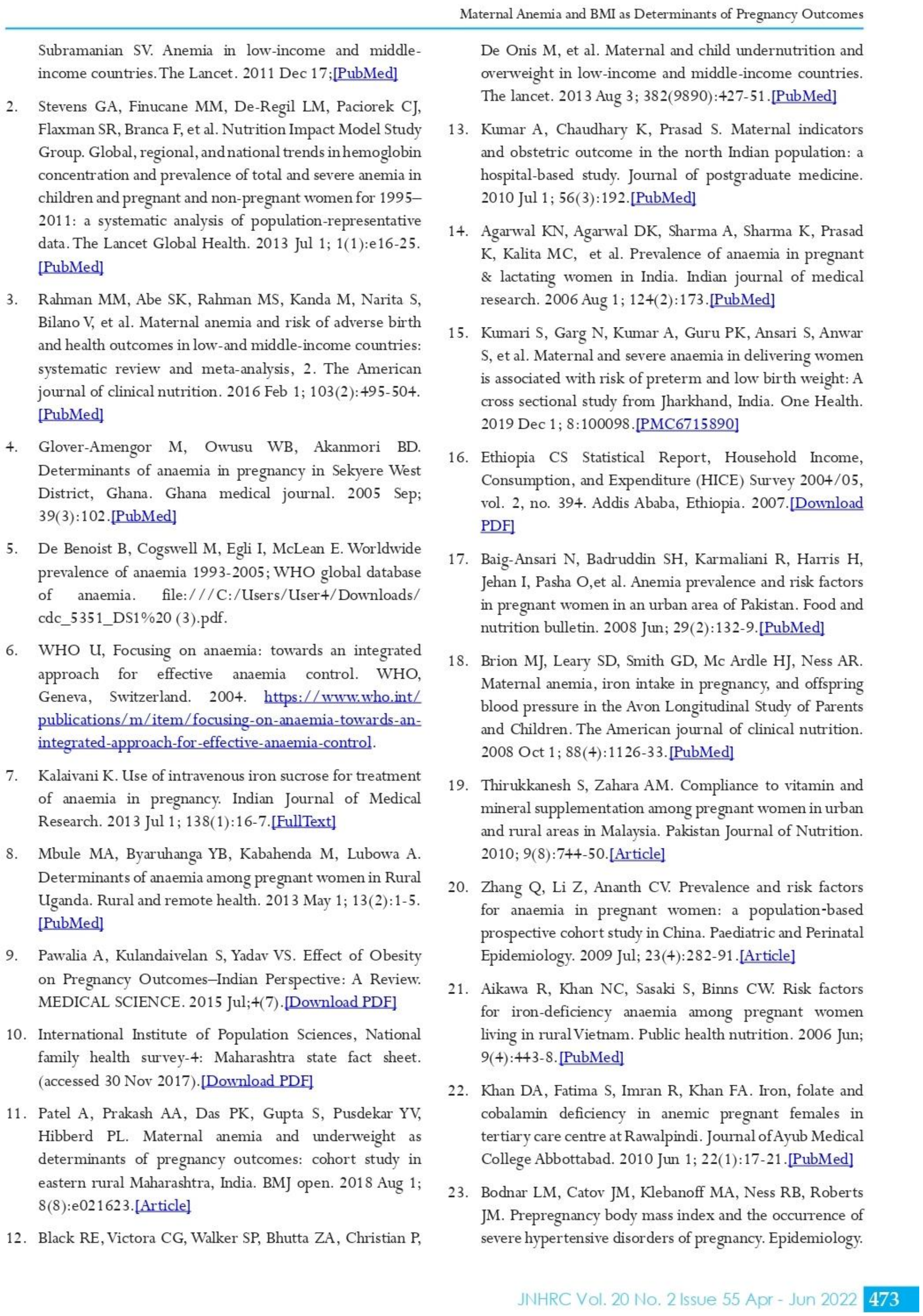

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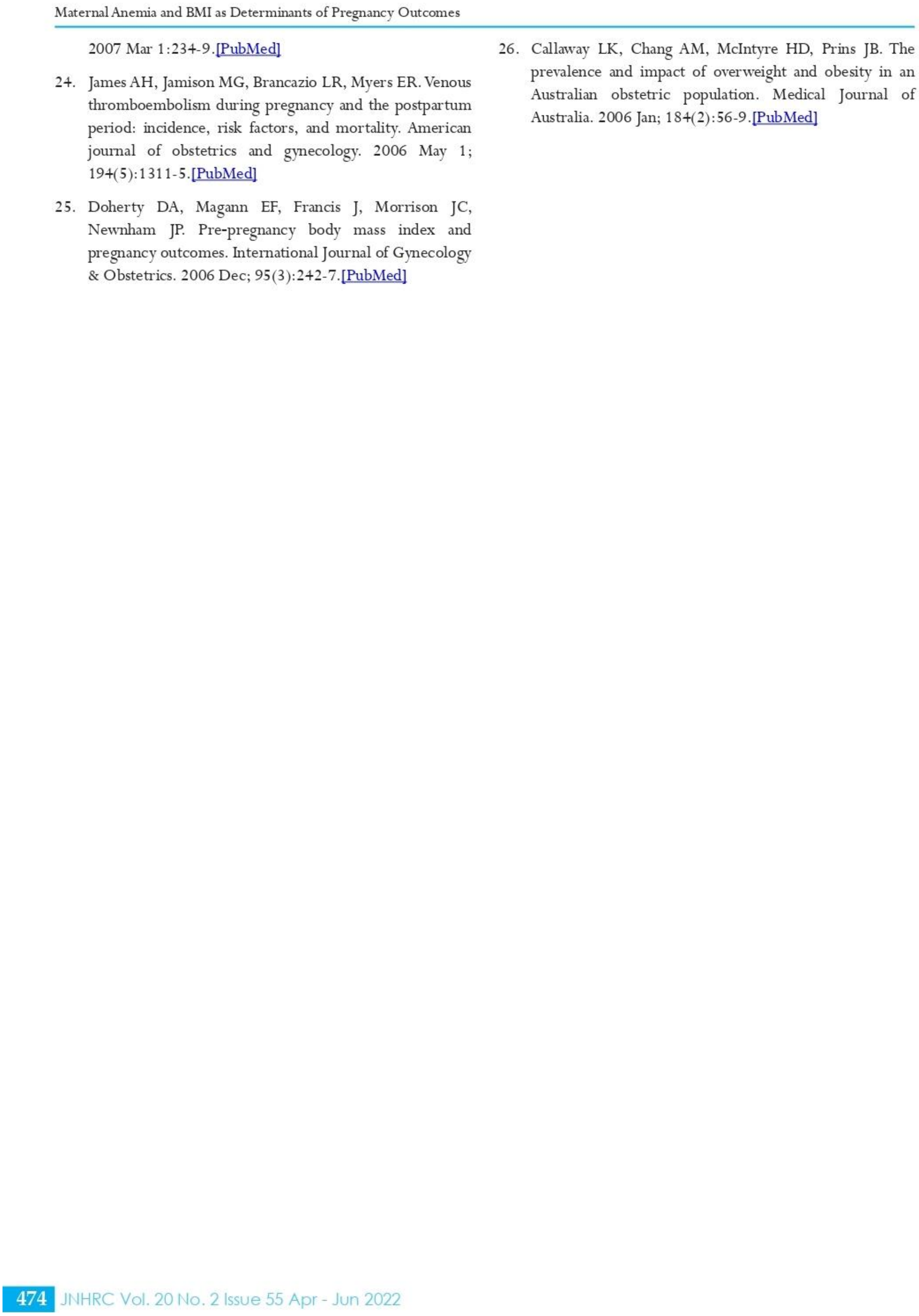

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DETERMINANTS OF IMMEDIATE ADVERSE PREGNANCY OUTCOMES: A HOSPITAL-BASED STUDY

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ABSTRACT

Adverse pregnancy outcomes are a major public health problem which can lead to serious short and long- term health effect to the mother and the newborn. Hence, the objective of this study is to find out the determinants of immediate adverse pregnancy outcomes in tertiary care hospital in South India. The study comprised of antenatal mothers admitted for delivery in selected tertiary care hospital in Belgaum, Karnataka, India from 10th November, 2021 to 20th January 2022. All registered deliveries in the study period have been included, comprises of 101. Bivariate logistic regression was used to determine the factors associated with outcome variables. A significance level of 5% was used to decide the significance of statistical tests. The mean age in years (± SD) of the mother was 24.6 (± 3.9). The average cost invested for a family health check-up in a year was Rupees 18,099. The average birth weight of the newborn was 2.7 kg, while the minimum weight of the newborn was 1.4 kg, and the maximum weight was 3.8 kg. The average week of gestation for the first-time with respect to antenatal care visit of pregnant women was 9.6 weeks. The average weight of the women was 47.6 kg during first antenatal care visit and 61.5 kg during last antenatal care visit. Adverse outcomes reported were post-partum hemorrhage was 7.9%, low birth weight 26.7%, preterm delivery 28.7%, anemia 53.5%, neonatal physiological and jaundice 15.8%. However, use of mode of transportation during antenatal care visit was found to be significant factor for preterm delivery. Every fourth baby was low birth weight, and every fourth women have preterm delivery and every second woman was anemic. Socioeconomic, demographic and chronic illness was associated with immediate adverse pregnancy outcomes.

KEYWORDS

Antenatal visit, postpartum hemorrhage, low birth weight, preterm delivery, blood transfusion, neonatal jaundice

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INTRODUCTION

The adverse pregnancy outcomes include low birth weight (LBW), stillbirth, and preterm birth.[1,2] Worldwide 15 million neonates are born preterm (<37 weeks of gestation) and this trend is increasing. A rate of 5% to 18% of preterm offsprings are born among 184 countries.[3] The most severe adverse outcome of pregnancy is the death of mother or her offspring.[4,5]

Birth or pregnancy-related complications occur every 2 minutes as per UNFPA report 2017.[6] Prematurity and low birth weights are the considerable cause of neonatal morbidity and mortality. This may lead to serious and long-term health effects on the mother and the neonates.[2,7] Socio-demographic and economic factors affect preterm delivery and low biological weight, dependent on maternal health status, maternal health behavior, and provision utilization of health facilities.[8]

Maternal mortality ratio (MMR) in India still remains high as 113 per 1,00,000 live births and Karnataka 92 per 1,00,000 live births.[9] The neonatal mortality rate is not uniform across the country with Kerala and Tamil Nadu having a low neonatal mortality rate (<20 per 1000 live births), Odisha, Madhya Pradesh and Uttar Pradesh with very high neonatal mortality rate (NMR) neonate mortality rate (35 or more per 1000 live births).[10]

Maternal, neonatal and infant mortality are the leading health problem in India, still maternal and neonatal mortality and morbidity, stillbirth has impacted by data gaps, especially regarding coverage and quality care of health institutions. Findings of the study will be useful in identifying the determinants of immediate adverse pregnancy outcomes among the women who are admitted to tertiary care hospital for delivery. This data can be used for health planning, policy-making and implementation. With the high burden of maternal and newborn morbidity and mortality, health care providers and policy makers can think and take required action against complications during pregnancy and labor. Based on the facts and figures, researcher realized that this type of study has rarely been done in India and it is needed to do such study.

MATERIALS AND METHODS

The study was conducted in KLE (Dr. Prabhakar Kore Charitable Hospital, Belagavi, Karnataka) which is one of the tertiary care hospitals located in south India. The hospital has a mainly rural catchment population for tertiary-level care.

A hospital-based cross-sectional study was conducted during 10th November to 20th January 2022. Antenatal mothers admitted for delivery in a tertiary care hospital in Belgaum, Karnataka, India were included (minimum sample size was 101).

Participant and enrolment: The purpose of the study has been already explained to women before the data collection, and written informed consent was taken from every subject. For socio-demographic, socio-economic condition, personal and previous antenatal information, semi-structured interview schedule techniques were used. For the maternal and new-born immediate adverse pregnancy outcome information checklist and patient's case sheet have been used. The total number of samples were 101. Data was collected from 10th November 2021 to 20th January, 2022.

Statistical analysis: The collected data was entered in MS Excel-2016 and exported in SPSS- version 20 for analysis. Data has been checked for consistency and completeness by exploratory data analysis before running the statistical analysis. Univariate and bi-variate were used to see the distribution of the study subjects by outcome variables (Post-Partum Hemorrhage (PPH), low birth weight, Anemia, preterm delivery, neonatal jaundice and Blood Transfusion). Bivariate logistic regressions were used to determine the factors associated with outcome variables. A significant level of 5%, was used to decide the significance of statistical tests.

Ethical considerations: Ethical clearance was obtained from the ethical review committee of KLE Academy of Higher Education and Research (KAHER), to conduct the study. Approval number (Ref. No. KAHER/EC/21-22/015). Further permission obtained from the Medical Director of KLE's Dr. Prabhakar Kore Charitable Hospital, and Medical Research Centre (MRC), department head of gynecology and obstetric ward. Discretion was maintained by making the data collectors aware not to record identifying information found on the persistent case sheet.

Data quality control and management: Data quality was ensured in collection, coding, entry, and analysis. Semi-structured interview schedule and patient case sheet, each case information was checked for its consistency, provision of full information and apposite documents.

RESULTS

The mean age (± SD) of the mother was 24.6 (± 3.9). The minimum scheduled family income in Indian currency was Rs. 9,000 while, maximum scheduled family income was Rs. 2,00,000. The average cost invested for a family health check-up in a year was Rs.18,099. The average size of the family living in a house was 7.3. The average birth weight of the newborn was 2.7 kg, while the minimum weight of the newborn was 1.4 kg, and the maximum weight was 3.8 kg. The average APGAR score of the newborn within one minute was 7.1/10. The average APGAR score of the newborn within 5 minutes was 8.5/10, and the average total hospital stay (day) was 7.9 days (Table 1a).

The average week of gestation for the first-time antenatal care visit of pregnant women was 9.6 weeks. While, the average total number of ANC visit was 7.9 times, whereas maximum total number of antenatal care visits was 15 times. The average gestational age of expecting women was 38 weeks (Table 1b).

The average number for utilization of health facilities was 8 times in a year. The average week of gestation for the first-time antenatal (ANC) visit of pregnant women was 9.6 weeks. The average total number of ANC visit was 7.9 times, whereas maximum total number of antenatal (ANC) visits was 15 times (Table 1b).

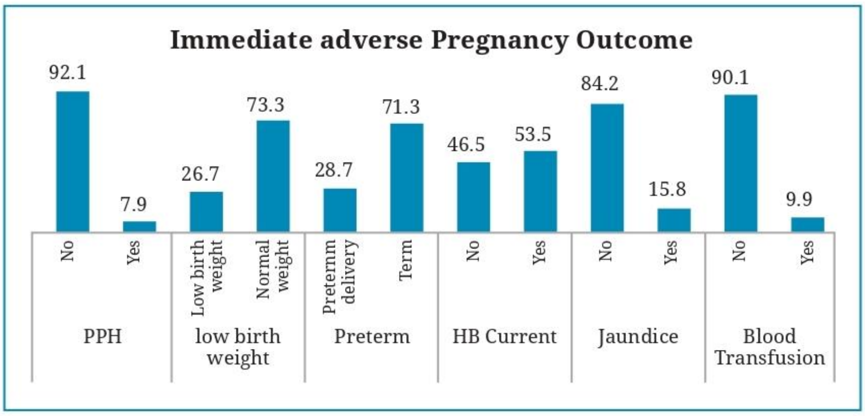

Fig. 1: Immediate adverse pregnancy outcomes' in tertiary care hospital, Karnataka, India. Post-partum hemmorrhage (PPH) 7.9%, low birth weight (LBW) 26.7%,preterm delivery 28.7%, anemia 53.5%, neonatal physiological jaundice 15.8% and blood transfusion (9.9%)

Table 1a: Descriptive statistics by socio-demographic and health variables

	N	**Mean**	**SD**	**Median**	**Min**	**Max**
Age (years)	**101**	**24.6**	**3.9**	**24.0**	**19.0**	**40.0**
Monthly family income (INR)	101	39703.0	33265.8	30000.0	9000.0	200000.0
cost invested for family health check up in a year (INR)	101	18099.0	19241.4	10000.0	2000.0	100000.0
No of family members live in Home	101	7.3	4.1	6.0	2.0	30.0
No of room in house	101	4.0	3.1	4.0	1.0	30.0
Birth weight (kg) -overall	101	2.7	0.6	2.7	1.4	3.8
Singleton birth weight (kg)	97	2.8	0.5	2.7	1.4	3.8
First twins birth weight (kg)	4	1.9	0.2	1.9	1.7	2.0
Weight of the second baby	4	1.9	0.1	1.9	1.8	2.0
APGAR score within 1 min	101	7.1	1.2	7.0	0.0	8.0
APGAR score within 5 min (/10)	101	8.5	1.0	9.0	0.0	9.0
Duration of hospital stay (day)	101	7.9	4.7	7.0	3.0	20.0

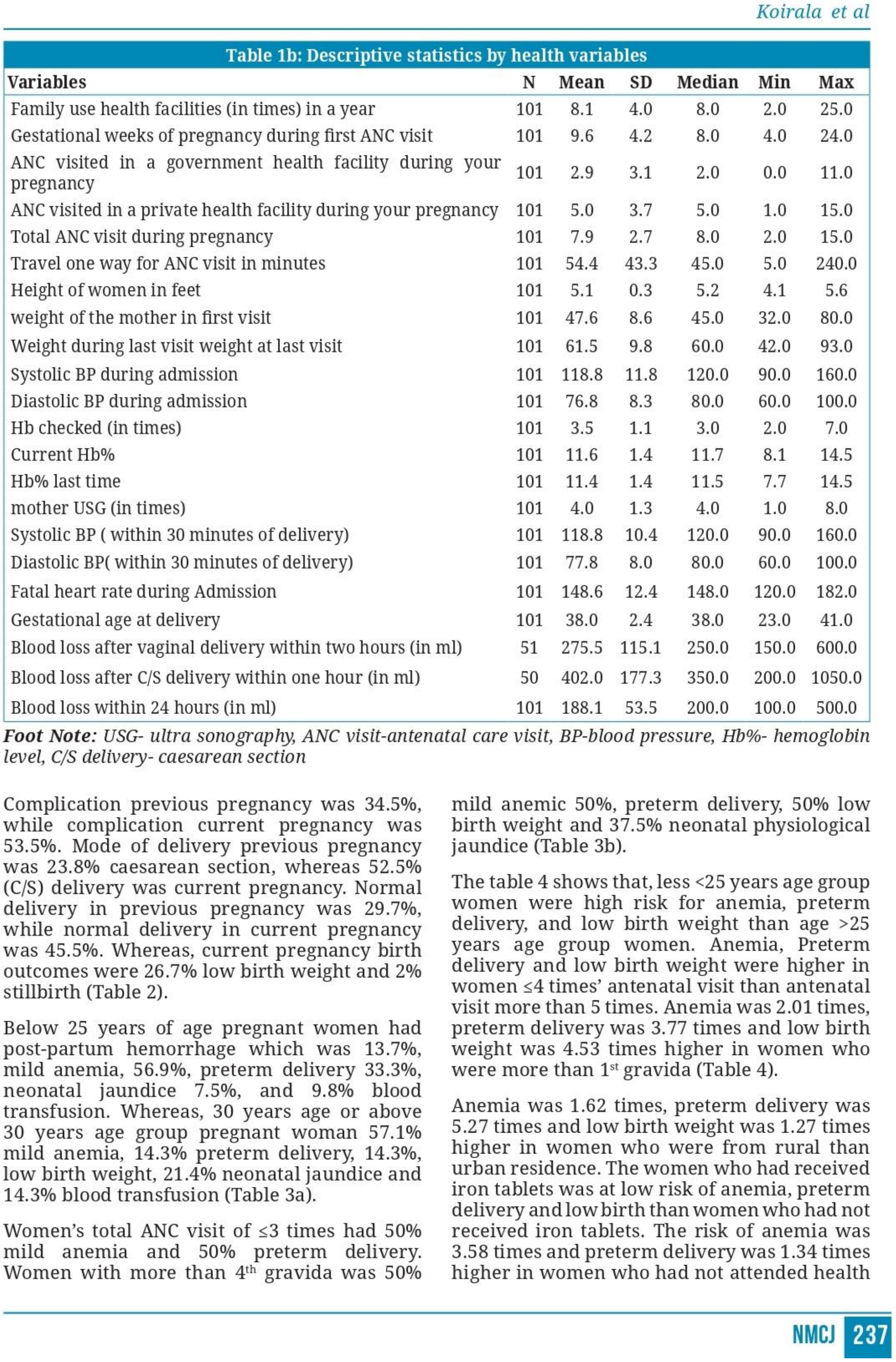

Table 1b: Descriptive statistics by health variables

Variables	N	Mean	SD	Median	Min	Max
Family use health facilities (in times) in a year	101	8.1	4.0	8.0	2.0	25.0
Gestational weeks of pregnancy during first ANC visit	101	9.6	4.2	8.0	4.0	24.0
ANC visited in a government health facility during your pregnancy	101	2.9	3.1	2.0	0.0	11.0
ANC visited in a private health facility during your pregnancy	101	5.0	3.7	5.0	1.0	15.0
Total ANC visit during pregnancy	101	7.9	2.7	8.0	2.0	15.0
Travel one way for ANC visit in minutes	101	54.4	43.3	45.0	5.0	240.0
Height of women in feet	101	5.1	0.3	5.2	4.1	5.6
weight of the mother in first visit	101	47.6	8.6	45.0	32.0	80.0
Weight during last visit weight at last visit	101	61.5	9.8	60.0	42.0	93.0
Systolic BP during admission	101	118.8	11.8	120.0	90.0	160.0
Diastolic BP during admission	101	76.8	8.3	80.0	60.0	100.0
Hb checked (in times)	101	3.5	1.1	3.0	2.0	7.0
Current Hb%	101	11.6	1.4	11.7	8.1	14.5
Hb% last time	101	11.4	1.4	11.5	7.7	14.5
mother USG (in times)	101	4.0	1.3	4.0	1.0	8.0
Systolic BP (within 30 minutes of delivery)	101	118.8	10.4	120.0	90.0	160.0
Diastolic BP(within 30 minutes of delivery)	101	77.8	8.0	80.0	60.0	100.0
Fatal heart rate during Admission	101	148.6	12.4	148.0	120.0	182.0
Gestational age at delivery	101	38.0	2.4	38.0	23.0	41.0
Blood loss after vaginal delivery within two hours (in ml)	51	275.5	115.1	250.0	150.0	600.0
Blood loss after C/S delivery within one hour (in ml)	50	402.0	177.3	350.0	200.0	1050.0
Blood loss within 24 hours (in ml)	101	188.1	53.5	200.0	100.0	500.0

Foot Note: *USG- ultra sonography, ANC visit-antenatal care visit, BP-blood pressure, Hb%- hemoglobin level, C/S delivery- caesarean section*

Complication previous pregnancy was 34.5%, while complication current pregnancy was 53.5%. Mode of delivery previous pregnancy was 23.8% caesarean section, whereas 52.5% (C/S) delivery was current pregnancy. Normal delivery in previous pregnancy was 29.7%, while normal delivery in current pregnancy was 45.5%. Whereas, current pregnancy birth outcomes were 26.7% low birth weight and 2% stillbirth (Table 2).

Below 25 years of age pregnant women had post-partum hemorrhage which was 13.7%, mild anemia, 56.9%, preterm delivery 33.3%, neonatal jaundice 7.5%, and 9.8% blood transfusion. Whereas, 30 years age or above 30 years age group pregnant woman 57.1% mild anemia, 14.3% preterm delivery, 14.3%, low birth weight, 21.4% neonatal jaundice and 14.3% blood transfusion (Table 3a).

Women's total ANC visit of ≤3 times had 50% mild anemia and 50% preterm delivery. Women with more than 4th gravida was 50% mild anemic 50%, preterm delivery, 50% low birth weight and 37.5% neonatal physiological jaundice (Table 3b).

The table 4 shows that, less <25 years age group women were high risk for anemia, preterm delivery, and low birth weight than age >25 years age group women. Anemia, Preterm delivery and low birth weight were higher in women ≤4 times' antenatal visit than antenatal visit more than 5 times. Anemia was 2.01 times, preterm delivery was 3.77 times and low birth weight was 4.53 times higher in women who were more than 1st gravida (Table 4).

Anemia was 1.62 times, preterm delivery was 5.27 times and low birth weight was 1.27 times higher in women who were from rural than urban residence. The women who had received iron tablets was at low risk of anemia, preterm delivery and low birth than women who had not received iron tablets. The risk of anemia was 3.58 times and preterm delivery was 1.34 times higher in women who had not attended health

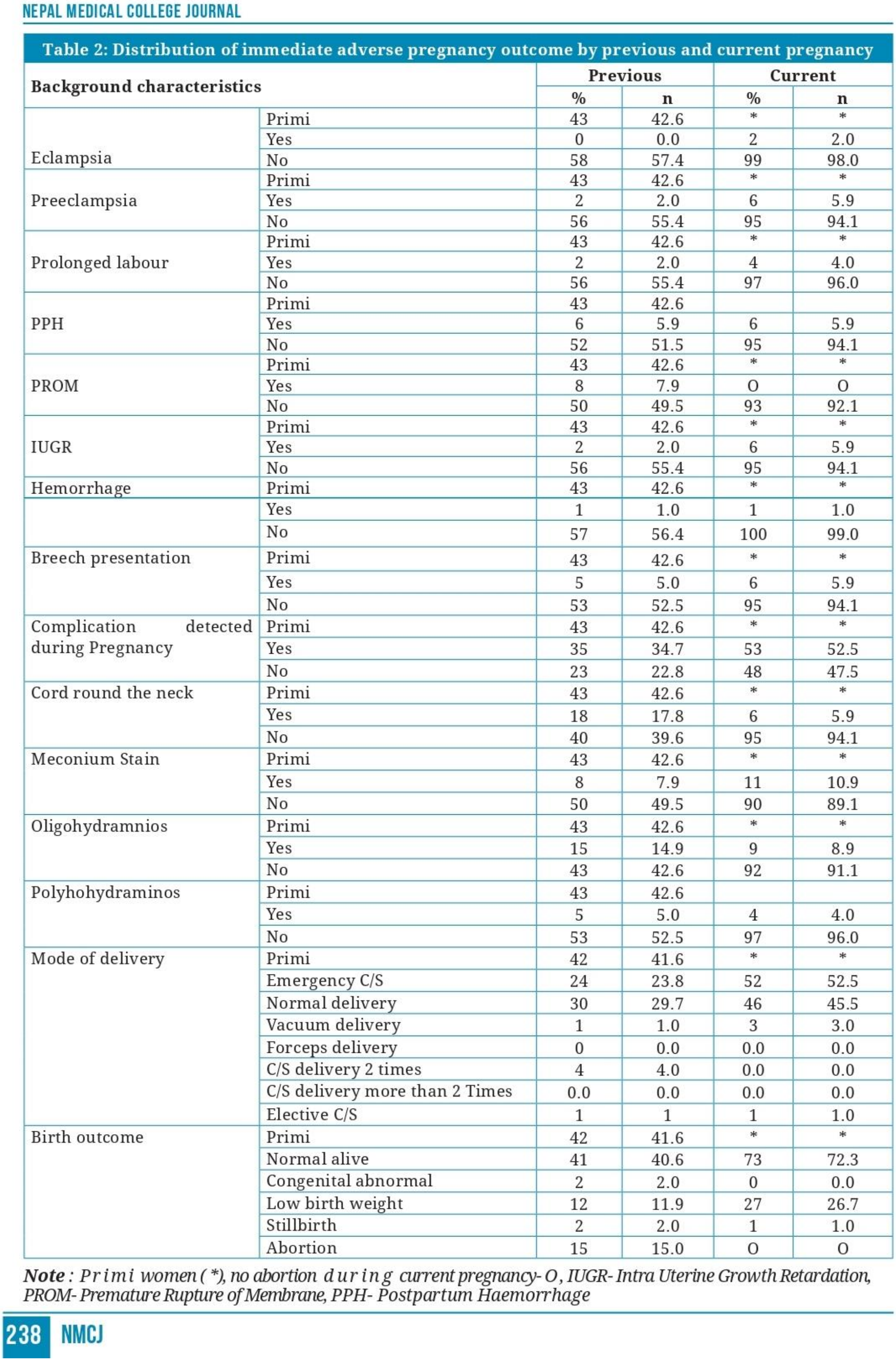

Table 2: Distribution of immediate adverse pregnancy outcome by previous and current pregnancy

Background characteristics		**Previous**		**Current**	
		%	**n**	**%**	**n**
Eclampsia	Primi	43	42.6	*	*
	Yes	0	0.0	2	2.0
	No	58	57.4	99	98.0
Preeclampsia	Primi	43	42.6	*	*
	Yes	2	2.0	6	5.9
	No	56	55.4	95	94.1
Prolonged labour	Primi	43	42.6	*	*
	Yes	2	2.0	4	4.0
	No	56	55.4	97	96.0
PPH	Primi	43	42.6		
	Yes	6	5.9	6	5.9
	No	52	51.5	95	94.1
PROM	Primi	43	42.6	*	*
	Yes	8	7.9	O	O
	No	50	49.5	93	92.1
IUGR	Primi	43	42.6	*	*
	Yes	2	2.0	6	5.9
	No	56	55.4	95	94.1
Hemorrhage	Primi	43	42.6	*	*
	Yes	1	1.0	1	1.0
	No	57	56.4	100	99.0
Breech presentation	Primi	43	42.6	*	*
	Yes	5	5.0	6	5.9
	No	53	52.5	95	94.1
Complication detected during Pregnancy	Primi	43	42.6	*	*
	Yes	35	34.7	53	52.5
	No	23	22.8	48	47.5
Cord round the neck	Primi	43	42.6	*	*
	Yes	18	17.8	6	5.9
	No	40	39.6	95	94.1
Meconium Stain	Primi	43	42.6	*	*
	Yes	8	7.9	11	10.9
	No	50	49.5	90	89.1
Oligohydramnios	Primi	43	42.6	*	*
	Yes	15	14.9	9	8.9
	No	43	42.6	92	91.1
Polyhohydraminos	Primi	43	42.6		
	Yes	5	5.0	4	4.0
	No	53	52.5	97	96.0
Mode of delivery	Primi	42	41.6	*	*
	Emergency C/S	24	23.8	52	52.5
	Normal delivery	30	29.7	46	45.5
	Vacuum delivery	1	1.0	3	3.0
	Forceps delivery	0	0.0	0.0	0.0
	C/S delivery 2 times	4	4.0	0.0	0.0
	C/S delivery more than 2 Times	0.0	0.0	0.0	0.0
	Elective C/S	1	1	1	1.0
Birth outcome	Primi	42	41.6	*	*
	Normal alive	41	40.6	73	72.3
	Congenital abnormal	2	2.0	0	0.0
	Low birth weight	12	11.9	27	26.7
	Stillbirth	2	2.0	1	1.0
	Abortion	15	15.0	O	O

***Note**: Primi women (*), no abortion during current pregnancy- O, IUGR- Intra Uterine Growth Retardation, PROM- Premature Rupture of Membrane, PPH- Postpartum Haemorrhage*

Table 3a: Distribution of outcomes (PPH, preterm delivery, low birth weight, jaundice, blood transfusion and Hb% count mild, moderate, severe and normal

Background characteristics		PPH %	Hb%		Preterm delivery %	Low birth weight	jaundice %	Blood transfusion %
			Mild	Normal				
Age	< 25 Years	13.7	56.9	43.1	33.3	31.4	7.8	9.8
	25-29 Years	2.8	47.2	52.8	27.8	25	25	8.3
	30+ Years	0	57.1	42.9	14.3	14.3	21.4	14.3
Labor started	Spontaneous	4	64	36	28	26	20	6
	Augmented	16.1	45.2	54.8	22.6	19.4	9.7	19.4
	No	5	40	60	40	40	15	5
Travel for ANC	<20	6.7	53.3	46.7	20	20	6.7	6.7
	20-59	5.3	52.6	47.4	34.2	26.3	15.8	15.8
	60-99	12.1	51.5	48.5	30.3	21.2	15.2	3
	100+	6.7	60	40	20	46.7	26.7	13.3
Total ANC Visit	<=3	0	50	50	50	0	0	0
	4-10	8	53.4	46.6	28.4	27.3	14.8	10.2
	11+	11.1	55.6	44.4	22.2	33.3	33.3	11.1
Gravida	1	11.9	50	50	33.3	33.3	19	7.1
	2-3	5.9	56.9	43.1	21.6	17.6	9.8	13.7
	4+	0	50	50	50	50	37.5	0
Monthly family income	<20000	13	60.9	39.1	30.4	26.1	21.7	17.4
	20000-40000	4.8	52.4	47.6	35.7	28.6	9.5	7.1
	40001+	8.3	50	50	19.4	25	19.4	8.3
Residence	Urban	6.3	56.3	43.8	21.9	21.9	21.9	9.4
	Semi urban	15.8	42.1	57.9	26.3	26.3	15.8	10.5
	Rural	6	56	44	34	30	12	10
Education of Woman	Illiterate	0	100	0	100	100	0	0
	Primary	0	100	0	0	0	100	0
	Secondary	7	53.5	46.5	30.2	32.6	16.3	9.3
	PUC	5.1	53.8	46.2	25.6	20.5	12.8	15.4
	Graduation	23.1	46.2	53.8	15.4	15.4	15.4	0
	Post-Graduation	0	50	50	75	50	25	0
Dietary habit	Thrice a day	8.1	53.5	46.5	29.3	27.3	16.2	9.1
	4+ times a day	0	50	50	0	0	0	50
current Hb%	Mild	7.4	100	0	31.5	24.1	22.2	16.7
	Normal	8.5	0	100	25.5	29.8	8.5	2.1

Foot Note: *PPH- Post Partum Hemorrhage, PD (Preterm Delivery), LBW- Low Birth Weight, NPJ-Neonatal physiological Jaundice, BT- Blood Transfusion, PT- Public Transportation, ANC visit – antenatal care visit, DM-Diabetes mellitus, HTN- Hypertension*

education provided by health professional during antenatal visit than mother who had attended health education provided by the health professional (Table 4).

Table 5 shows that, neonatal jaundice in 25-29 years age group women's newborn was 10.48 times higher than in <25 years age group. Blood transfusion was 64% increase risk in above 30 years age group women. While, neonatal physiological jaundice was 7.65 times higher in more than 4th gravida than 2-3 gravida. Neonatal physiological jaundice was higher in women whose family income was Rs <20000 per month than above Rs.20000 per month (Table 5).

Neonatal physiological jaundice was 2.43 times higher in women with PUC education than secondary level education women. Neonatal jaundice was higher in women with the problem of hypertension than women without problem of hypertension. Likewise, neonatal jaundice was higher in women without attend heath education provided by the health professional during antenatal visit than mother who attended antenatal health education (Table 5).

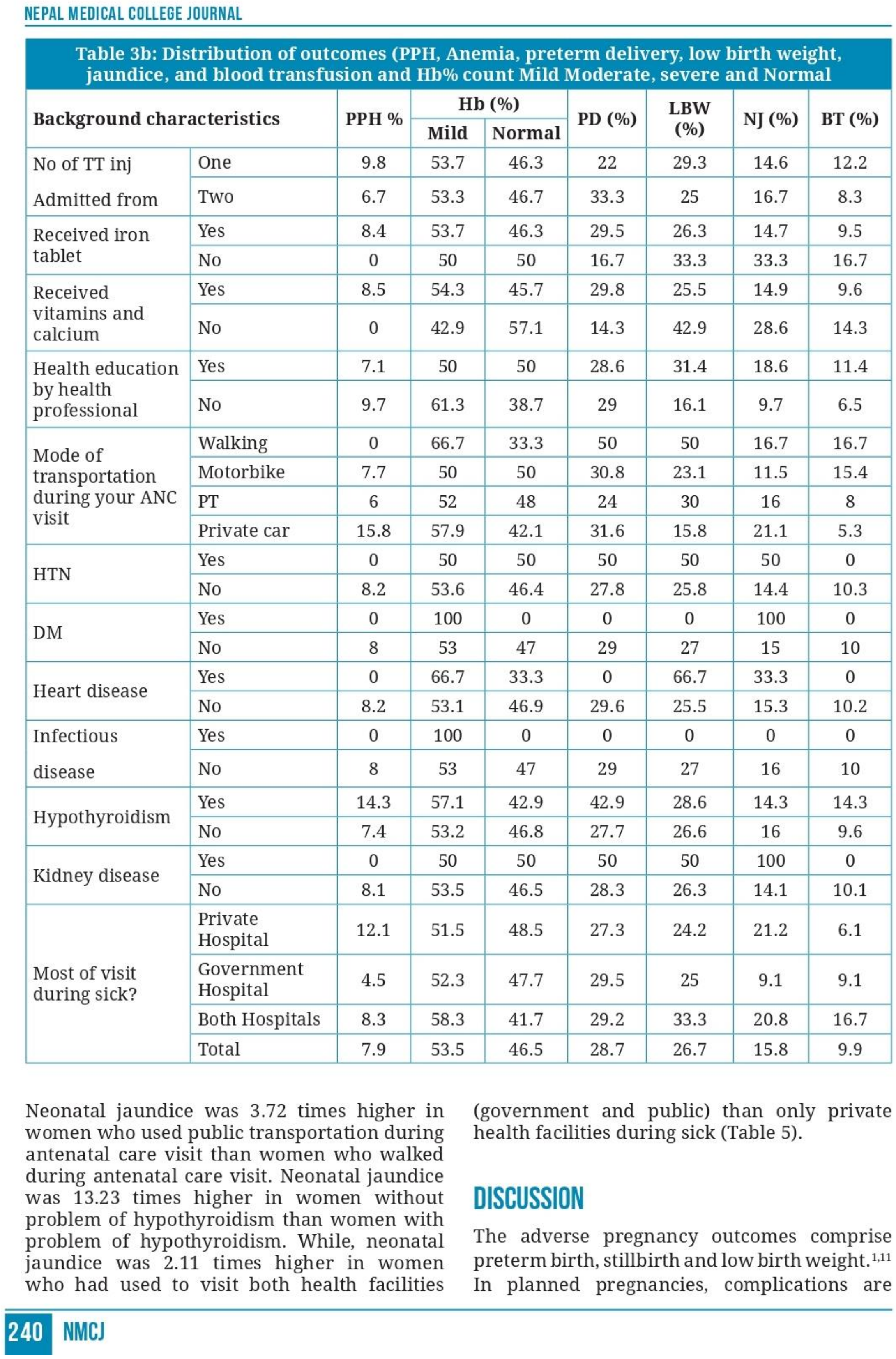

Table 3b: Distribution of outcomes (PPH, Anemia, preterm delivery, low birth weight, jaundice, and blood transfusion and Hb% count Mild Moderate, severe and Normal

Background characteristics		PPH %	Hb (%)		PD (%)	LBW (%)	NJ (%)	BT (%)
			Mild	Normal				
No of TT inj	One	9.8	53.7	46.3	22	29.3	14.6	12.2
Admitted from	Two	6.7	53.3	46.7	33.3	25	16.7	8.3
Received iron tablet	Yes	8.4	53.7	46.3	29.5	26.3	14.7	9.5
	No	0	50	50	16.7	33.3	33.3	16.7
Received vitamins and calcium	Yes	8.5	54.3	45.7	29.8	25.5	14.9	9.6
	No	0	42.9	57.1	14.3	42.9	28.6	14.3
Health education by health professional	Yes	7.1	50	50	28.6	31.4	18.6	11.4
	No	9.7	61.3	38.7	29	16.1	9.7	6.5
Mode of transportation during your ANC visit	Walking	0	66.7	33.3	50	50	16.7	16.7
	Motorbike	7.7	50	50	30.8	23.1	11.5	15.4
	PT	6	52	48	24	30	16	8
	Private car	15.8	57.9	42.1	31.6	15.8	21.1	5.3
HTN	Yes	0	50	50	50	50	50	0
	No	8.2	53.6	46.4	27.8	25.8	14.4	10.3
DM	Yes	0	100	0	0	0	100	0
	No	8	53	47	29	27	15	10
Heart disease	Yes	0	66.7	33.3	0	66.7	33.3	0
	No	8.2	53.1	46.9	29.6	25.5	15.3	10.2
Infectious disease	Yes	0	100	0	0	0	0	0
	No	8	53	47	29	27	16	10
Hypothyroidism	Yes	14.3	57.1	42.9	42.9	28.6	14.3	14.3
	No	7.4	53.2	46.8	27.7	26.6	16	9.6
Kidney disease	Yes	0	50	50	50	50	100	0
	No	8.1	53.5	46.5	28.3	26.3	14.1	10.1
Most of visit during sick?	Private Hospital	12.1	51.5	48.5	27.3	24.2	21.2	6.1
	Government Hospital	4.5	52.3	47.7	29.5	25	9.1	9.1
	Both Hospitals	8.3	58.3	41.7	29.2	33.3	20.8	16.7
	Total	7.9	53.5	46.5	28.7	26.7	15.8	9.9

Neonatal jaundice was 3.72 times higher in women who used public transportation during antenatal care visit than women who walked during antenatal care visit. Neonatal jaundice was 13.23 times higher in women without problem of hypothyroidism than women with problem of hypothyroidism. While, neonatal jaundice was 2.11 times higher in women who had used to visit both health facilities (government and public) than only private health facilities during sick (Table 5).

DISCUSSION

The adverse pregnancy outcomes comprise preterm birth, stillbirth and low birth weight.[1,11] In planned pregnancies, complications are

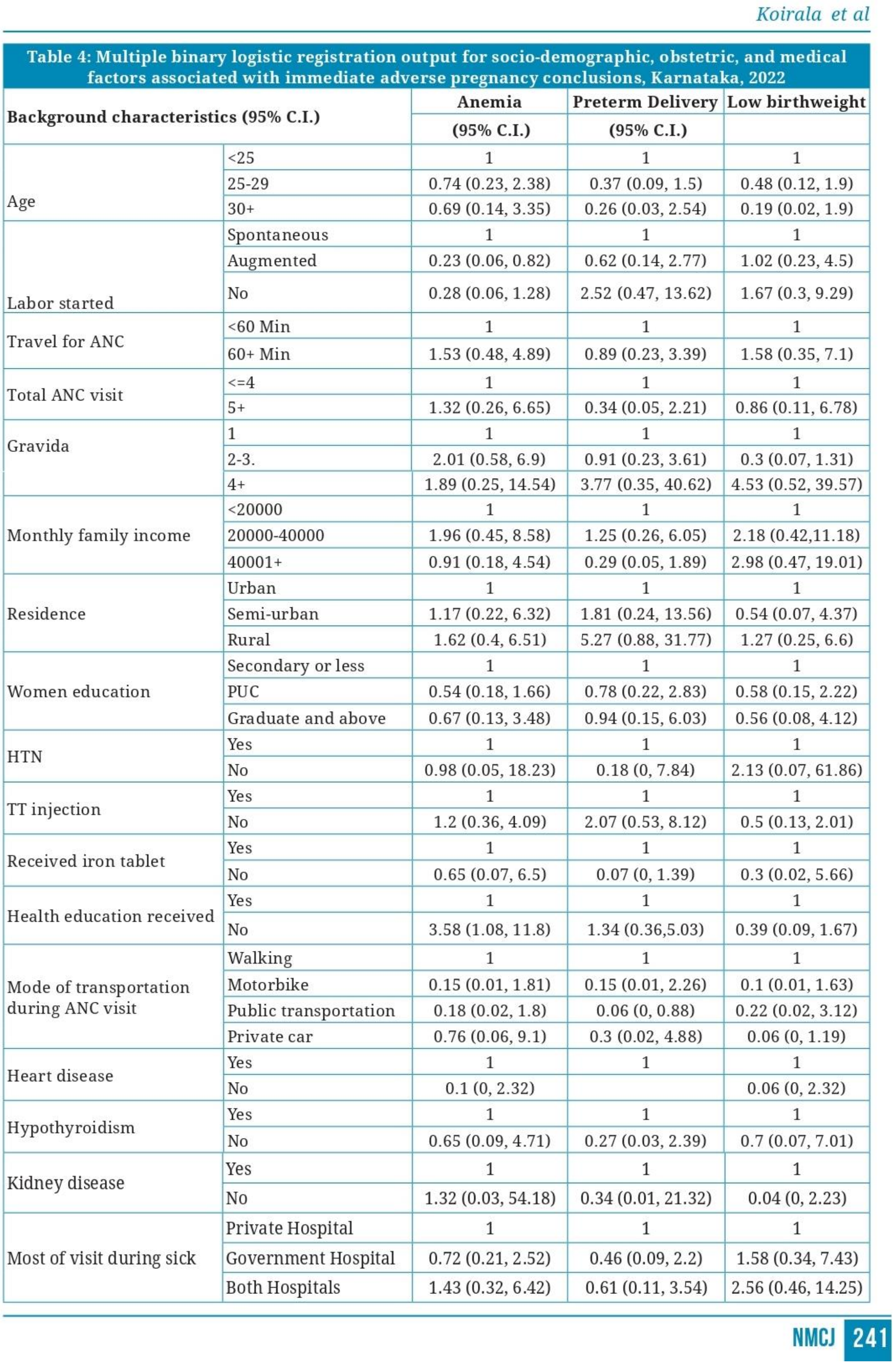

Table 4: Multiple binary logistic registration output for socio-demographic, obstetric, and medical factors associated with immediate adverse pregnancy conclusions, Karnataka, 2022

Background characteristics (95% C.I.)		**Anemia**	**Preterm Delivery**	**Low birthweight**
		(95% C.I.)	**(95% C.I.)**	
Age	<25	1	1	1
	25-29	0.74 (0.23, 2.38)	0.37 (0.09, 1.5)	0.48 (0.12, 1.9)
	30+	0.69 (0.14, 3.35)	0.26 (0.03, 2.54)	0.19 (0.02, 1.9)
Labor started	Spontaneous	1	1	1
	Augmented	0.23 (0.06, 0.82)	0.62 (0.14, 2.77)	1.02 (0.23, 4.5)
	No	0.28 (0.06, 1.28)	2.52 (0.47, 13.62)	1.67 (0.3, 9.29)
Travel for ANC	<60 Min	1	1	1
	60+ Min	1.53 (0.48, 4.89)	0.89 (0.23, 3.39)	1.58 (0.35, 7.1)
Total ANC visit	<=4	1	1	1
	5+	1.32 (0.26, 6.65)	0.34 (0.05, 2.21)	0.86 (0.11, 6.78)
Gravida	1	1	1	1
	2-3.	2.01 (0.58, 6.9)	0.91 (0.23, 3.61)	0.3 (0.07, 1.31)
	4+	1.89 (0.25, 14.54)	3.77 (0.35, 40.62)	4.53 (0.52, 39.57)
Monthly family income	<20000	1	1	1
	20000-40000	1.96 (0.45, 8.58)	1.25 (0.26, 6.05)	2.18 (0.42,11.18)
	40001+	0.91 (0.18, 4.54)	0.29 (0.05, 1.89)	2.98 (0.47, 19.01)
Residence	Urban	1	1	1
	Semi-urban	1.17 (0.22, 6.32)	1.81 (0.24, 13.56)	0.54 (0.07, 4.37)
	Rural	1.62 (0.4, 6.51)	5.27 (0.88, 31.77)	1.27 (0.25, 6.6)
Women education	Secondary or less	1	1	1
	PUC	0.54 (0.18, 1.66)	0.78 (0.22, 2.83)	0.58 (0.15, 2.22)
	Graduate and above	0.67 (0.13, 3.48)	0.94 (0.15, 6.03)	0.56 (0.08, 4.12)
HTN	Yes	1	1	1
	No	0.98 (0.05, 18.23)	0.18 (0, 7.84)	2.13 (0.07, 61.86)
TT injection	Yes	1	1	1
	No	1.2 (0.36, 4.09)	2.07 (0.53, 8.12)	0.5 (0.13, 2.01)
Received iron tablet	Yes	1	1	1
	No	0.65 (0.07, 6.5)	0.07 (0, 1.39)	0.3 (0.02, 5.66)
Health education received	Yes	1	1	1
	No	3.58 (1.08, 11.8)	1.34 (0.36,5.03)	0.39 (0.09, 1.67)
Mode of transportation during ANC visit	Walking	1	1	1
	Motorbike	0.15 (0.01, 1.81)	0.15 (0.01, 2.26)	0.1 (0.01, 1.63)
	Public transportation	0.18 (0.02, 1.8)	0.06 (0, 0.88)	0.22 (0.02, 3.12)
	Private car	0.76 (0.06, 9.1)	0.3 (0.02, 4.88)	0.06 (0, 1.19)
Heart disease	Yes	1	1	1
	No	0.1 (0, 2.32)		0.06 (0, 2.32)
Hypothyroidism	Yes	1	1	1
	No	0.65 (0.09, 4.71)	0.27 (0.03, 2.39)	0.7 (0.07, 7.01)
Kidney disease	Yes	1	1	1
	No	1.32 (0.03, 54.18)	0.34 (0.01, 21.32)	0.04 (0, 2.23)
Most of visit during sick	Private Hospital	1	1	1
	Government Hospital	0.72 (0.21, 2.52)	0.46 (0.09, 2.2)	1.58 (0.34, 7.43)
	Both Hospitals	1.43 (0.32, 6.42)	0.61 (0.11, 3.54)	2.56 (0.46, 14.25)

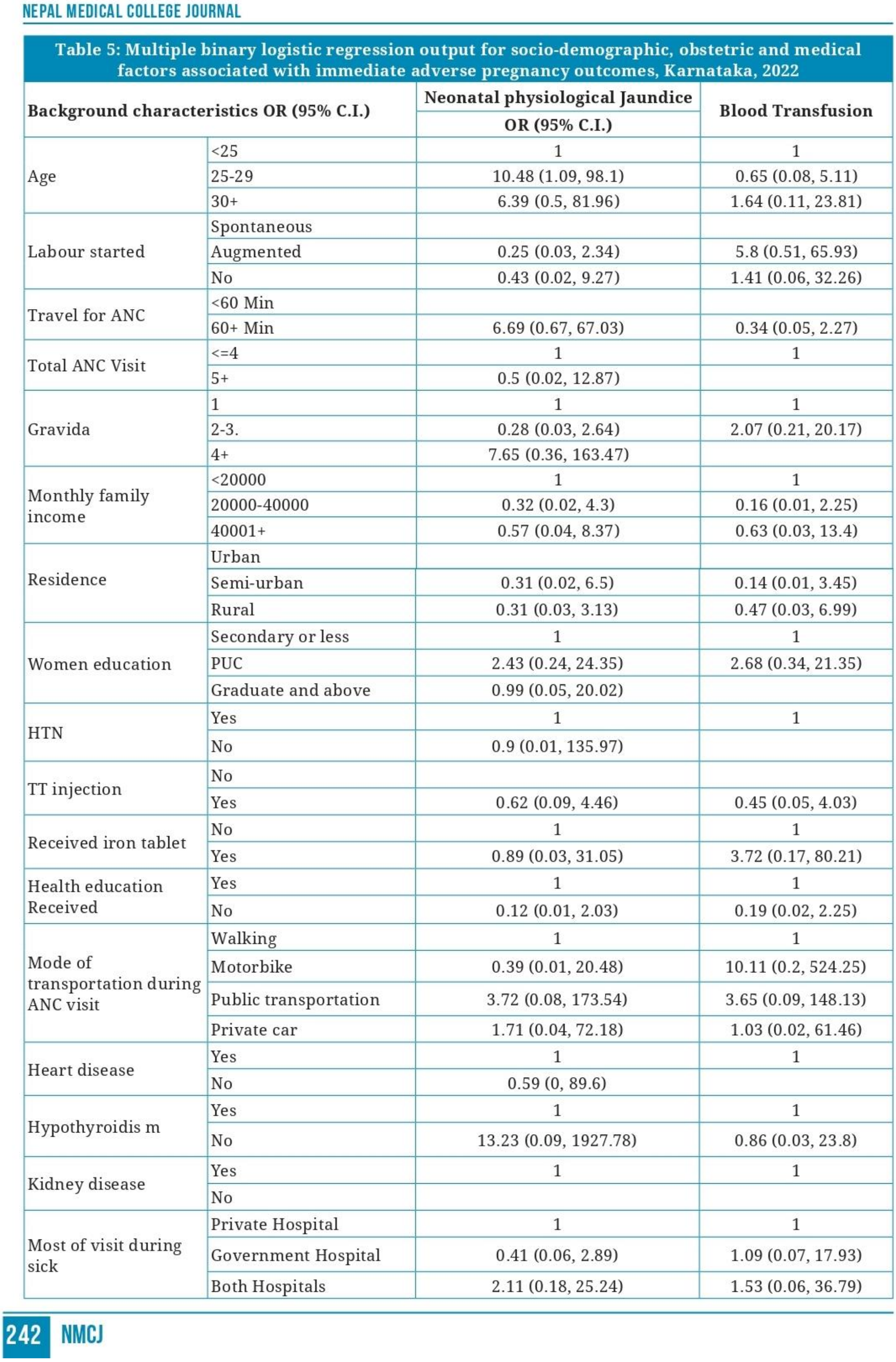

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Table 5: Multiple binary logistic regression output for socio-demographic, obstetric and medical factors associated with immediate adverse pregnancy outcomes, Karnataka, 2022

Background characteristics OR (95% C.I.)		Neonatal physiological Jaundice	Blood Transfusion
		OR (95% C.I.)	
Age	<25	1	1
	25-29	10.48 (1.09, 98.1)	0.65 (0.08, 5.11)
	30+	6.39 (0.5, 81.96)	1.64 (0.11, 23.81)
Labour started	Spontaneous		
	Augmented	0.25 (0.03, 2.34)	5.8 (0.51, 65.93)
	No	0.43 (0.02, 9.27)	1.41 (0.06, 32.26)
Travel for ANC	<60 Min		
	60+ Min	6.69 (0.67, 67.03)	0.34 (0.05, 2.27)
Total ANC Visit	<=4	1	1
	5+	0.5 (0.02, 12.87)	
Gravida	1	1	1
	2-3.	0.28 (0.03, 2.64)	2.07 (0.21, 20.17)
	4+	7.65 (0.36, 163.47)	
Monthly family income	<20000	1	1
	20000-40000	0.32 (0.02, 4.3)	0.16 (0.01, 2.25)
	40001+	0.57 (0.04, 8.37)	0.63 (0.03, 13.4)
Residence	Urban		
	Semi-urban	0.31 (0.02, 6.5)	0.14 (0.01, 3.45)
	Rural	0.31 (0.03, 3.13)	0.47 (0.03, 6.99)
Women education	Secondary or less	1	1
	PUC	2.43 (0.24, 24.35)	2.68 (0.34, 21.35)
	Graduate and above	0.99 (0.05, 20.02)	
HTN	Yes	1	1
	No	0.9 (0.01, 135.97)	
TT injection	No		
	Yes	0.62 (0.09, 4.46)	0.45 (0.05, 4.03)
Received iron tablet	No	1	1
	Yes	0.89 (0.03, 31.05)	3.72 (0.17, 80.21)
Health education Received	Yes	1	1
	No	0.12 (0.01, 2.03)	0.19 (0.02, 2.25)
Mode of transportation during ANC visit	Walking	1	1
	Motorbike	0.39 (0.01, 20.48)	10.11 (0.2, 524.25)
	Public transportation	3.72 (0.08, 173.54)	3.65 (0.09, 148.13)
	Private car	1.71 (0.04, 72.18)	1.03 (0.02, 61.46)
Heart disease	Yes	1	1
	No	0.59 (0, 89.6)	
Hypothyroidis m	Yes	1	1
	No	13.23 (0.09, 1927.78)	0.86 (0.03, 23.8)
Kidney disease	Yes	1	1
	No		
Most of visit during sick	Private Hospital	1	1
	Government Hospital	0.41 (0.06, 2.89)	1.09 (0.07, 17.93)
	Both Hospitals	2.11 (0.18, 25.24)	1.53 (0.06, 36.79)

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few and outcomes are generally auspicious for maternal and newborns in developed countries.[4,12] However, in low-income countries, chances of adverse pregnancy outcomes are more frequent. Therefore, this study was aimed to measure the determinants of immediate adverse pregnancy outcomes in Karnataka, India. Postpartum hemorrhage was 7.9%, low birth weight 26.7%, preterm delivery 28.7%, anemia 53.5%, neonatal physiological jaundice 15.8% and blood transfusion 9.9%. Whereas, 12% premature birth, 8% low birth weight and 3% have major congenital abnormalities.[13,14]

This study also revealed that, preterm delivery (28.7%) was higher than a previous study which was done in Gondar University Hospital, Northwest Ethiopia (17.1%).[15] Similarly, this finding was higher than reports from South West Ethiopia (22.5%), and nearly similar in West Bengal (28.8%). Preterm delivery was similar to Ethiopian Demographic Health Survey (EDHS) 2011, which was (28%).[16-18]

In this study augmented labor and blood transfusion was found to be significant factor for anemia and preterm delivery was significantly associated with using the mode of transportation during ANC visit. Other studies found that, adverse pregnancy outcomes were significantly associated with previous obstetric history and adverse birth outcomes.[19-21]

Socioeconomic factors, maternal education, residence and family monthly income were associated with preterm delivery. Other studies indicates that, socioeconomic factors, maternal education, residence, monthly household income had a significant association with preterm delivery.[22-25] This study shows that, illness during pregnancy was associated with poor pregnancy outcomes. However, previous study had illness during pregnancy which was significantly associated with poor pregnancy outcomes. This finding was consistent with a similar study done in Kenya.[24] Furthermore, this study disclose that, anemic mothers had a higher chance to deliver low birth weight neonates, consistent with a study.[25] In this study, gravida, residence, number of antenatal visits, utilization of health facilities, TT vaccination, dietary pattern, distance of health facilities, previous pregnancy complications, current medical illness, previous obstetric/abortion history, and anemia are determines factors of current pregnancy outcomes. Whereas a similar study 'Determinants of adverse pregnancy outcomes' was done in Jimma University's specialized hospital.[1]

In conclusion, determinants of immediate adverse pregnancy outcomes were; 7.9% postpartum hemorrhage, 26.7% low birth weight 28.7%, preterm delivery 53.5% anemia, 15.8% neonatal physiological jaundice and 9.9% blood transfusion. Whereas, determinants factors which affected immediate adverse pregnancy outcomes were; socioeconomic, demographic, previous obstetric history, and chronic illness, which were associated with anemia, preterm delivery, low birth weight, neonatal jaundice, postpartum hemorrhage, and blood transfusion. Augmented labor and blood transfusion were found significant factor for anemia, whereas use of mode of transportation during antenatal visit was found to be significant factor for preterm delivery.

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