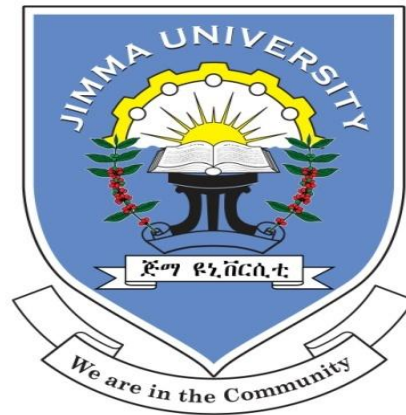PREVALENCE AND MATERNAL MANAGEMNT OUTCOMES OF PRIMARY POSTPARTUM HEMORRHAGE AMONG MOTHERS DELIVERD AT ATTAT PRIMARY HOSPITAL SNNPR STATE, GURAGIE ZONE, SOUTH- ETHIOPIA, 2017.

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A RESEARCH PAPER SUBMITTED TO THE HEALTH RESEARCH AND GRADUATING STUDIES COORDINATING OFFICE, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE, JIMMA UNIVERSITY; IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE MASTERS DEGREE IN INTEGRATED EMERGENCY SURGERY AND OBSTETRICS.

OCTOBER, 2017

JIMMA, ETHIOPIA

PREVALENCE AND MATERNAL MANAGEMENT OUTCOMES OF PRIMARY POSTPARTUM HEMORRHAGE AMONG MOTHERS DELIVERD AT ATTAT PRIMARY HOSPITAL SNNPR STATE, GURAGIE ZONE, SOUTH- ETHIOPIA, 2017.

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OCTOBER, 2017

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Abstract

Background: Primary postpartum hemorrhage (PPH) defined as blood loss in excess of 500 ml and 1000ml from the genital tract within the first 24hours following vaginal delivery and cesarean delivery respectively. Postpartum hemorrhage is a main cause of considerable maternal morbidity and mortality worldwide. Seventy to ninety percent of immediate postpartum hemorrhage is attributed to uterine atony.

Objective: To determine the prevalence, causes and management outcome of primary postpartum hemorrhage at Attat Primary Hospital, from January 1 to June 30/2017.

Method: Hospital based cross-sectional study was done in Attat Primary Hospital: 105 diagnosed cases of primary PPH were subjected to a predesigned questionnaire. Data was collected using data collection checklists by patient interview and from patient folder by trained data collectors from January 1-June 30/2017. The collected data was cleaned, and entered and analyzed using SPSS Version 21 computer software. The results were presented by tables, diagrams, charts and text accordingly.

Result: The prevalence of PPH was 5.9% with the commonest causes of uterine atony which represented 67.6% and followed by retained placenta and genital tract laceration which accounted 17.1% and 15.2% respectively. Anemia during pregnancy with AOR 6.84; 95% CI (1.40-15.51%), multiple pregnancy with AOR 6.41; 95% CI (3.92-10.46),pregnancy induced hypertension with AOR 18.58; 95% CI (1.02-33.72); and previous cesarean section with AOR 19.45; 95%CI (1.28-29.55) were associated risk factors for management outcome of primary PPH.

Conclusion: The prevalence of primary postpartum hemorrhage was 5.9% and 3.8% of mothers were died during the study period. Anemia during pregnancy, multiple gestation, hypertensive disorder of pregnancy, and previous cesarean delivery were associated risk factors for maternal outcome.

Recommendations: Risk factors associated for increasing maternal mortality from PPH like anemia during pregnancy, and hypertensive disorder of pregnancy should be identified and treated early during pregnancy; furthermore, well designed, large and multicentric studies are needed.

Keywords: Primary postpartum hemorrhage, uterine atony, maternal mortality, maternal outcome

Acknowledgment

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ABBREVIATION

AMTSL	Active Management of the Third Stage of Labour
APH	Ante partum Haemorrhage
C/S	Caesarean Section
CCT	Controlled Cord Traction
IESO	Integrated Emergency Surgery and Obstetrics
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
PPH	Postpartum Haemorrhage
SNNPR	Southern Nation Nationality & Peoples Region
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Sciences
SVD	Spontaneous Vaginal Delivery
TAH	Total Abdominal Hysterectomy
WHO	World Health Organization

CHAPTER ONE- INTRODUCTION

1.1 Background

Globally it is estimated that half a million women die annually from cause related to pregnancy and childbirth and that half of these deaths are related to obstetrics hemorrhage [1]. In 2015, the maternal mortality ratio (MMR) – defined as the number of maternal deaths per 100,000 live births – was estimated 216 globally. This translates into approximately 830 women dying every single day due to the complications of pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented [2].

In developing countries PPH continuous to be the leading cause of maternal mortality, accounting for 25-43% of maternal deaths. Postpartum hemorrhage is a frequent complication of deliveries and its incidence is commonly reported as 2-4%, after vaginal deliveries and 6% after cesarean sections; with uterine atony being the cause in about 50% of the cases(3). Primary postpartum hemorrhage is the loss of more than 500 ml of blood within the first twenty-four hours of delivery or loss of any amount that is enough to cause hemodynamic instability in the mother or loss of more than 10% of the total blood volume. It is the most common form of postpartum hemorrhage [4, 5]. It is thought that most PPHs result from an atonic uterus, where the loss of myometrial tone allows maternal blood flow to the placental bed continue unchecked. Other causes include retained placental tissue, tears of the uterus, cervix, or vagina, and clotting disorders (the '4Ts' mnemonic: tone, tissue, trauma, and thrombin). Antenatal risk factors for PPH include Asian ethnicity, obesity, previous PPH, multiple pregnancy, anemia, large baby, placenta previa, and age over 40 years. Intrapartum risk factors include induction of labor, prolonged labor, Intrapartum pyrexia, placental abruption, episiotomy, operative vaginal delivery, retained placenta, and delivery by cesarean section [6].

Majority of maternal deaths due to PPH can be avoided and the key is early diagnosis and proper treatment. However, PPH is one of the most challenging complications faced by clinicians (7).Postpartum hemorrhage is most preventable and treatable through active management of the third stage of labor (AMTSL) by conventional uterotonics, among which oxytocin is preferred, however, use of oxytocin is not feasible in many low income settings where most births take place at home with untrained birth attendants. Immediate resuscitation with attempts to treat the Cause forms the cornerstone of management of PPH (8)

1.2   Statement of the Problem

In low-income countries, postpartum hemorrhage is a major cause of maternal death and arguably the most preventable. Management strategies in developed countries involve crystalloid fluid replacement, blood transfusions, and surgery. These definitive therapies are often not accessible in developing countries. Long transports from home or primary health care facilities, lack of skilled providers, and lack of intravenous fluids and/or a safe blood supply often create long delays in instituting appropriate treatment(3).

The lack of skilled attendants at delivery who can provide even the minimum of care, long transport times to facilities that can manage uterine atony or severe lacerations of the genital tract and unattended obstructed labor leading to a ruptured uterus conspire to elevate PPH to its position as the number one killer of women during child birth(6).

These structural factors are exacerbated by the prevalence of anemia, which is estimated to affect half of all pregnant women in the world, with that figure rising to 94% in Papua New Guinea, 88% in India, and 86% in Tanzania. Anemia is rarely detected or treated during pregnancy and often exacerbated by malarial and other parasitic diseases. Severe anemia may weaken uterine muscular strength or lower resistance to infectious disease, contributing to PPH and subsequent maternal mortality (9).

In developing countries, health system face constraints that hinder the delivery of emergency care, which is vital for saving the lives of women who develop PPH. Guidance to aid clinical practice is not commonly available in developing countries. Socioeconomic status and illiteracy also may contribute for the prevalence of PPH (8).

Despite the severe burden of PPH, few studies have examined risk factors, incidence, and management outcome predicting PPH in Ethiopia. This study will investigate the prevalence of PPH, causes and management outcome in Attat Primary Hospital.

1.3 Significance of the Study

One of the sustainable development goals (SDG) was to reduce maternal mortality 70 per 100,000 live births by 2030. If this is to be achieved, maternal deaths related to PPH must be significantly reduced. In support of this, health workers in developing countries need to have access to appropriate information to ensure identification of risks, early diagnosis and provision of appropriate management. The overall aim of this study is to determine the prevalence, causes and maternal outcome of primary PPH. Exploring the prevalence, causes and maternal outcome of PPH will help health care providers with information for prompt decision making in the care of women and improved quality of care during pregnancy, labor and after delivery.

CHAPTER TWO- LITERATURE REVIEW

2.1 Literature Review

Findings from the WHO multicountry survey report shows the rate of PPH among all women was 1.2%, and factors significantly associated with PPH diagnosis included age, parity, gestational age, induction of labor, cesarean section, and geographic region (10). A systematic review and meta-analysis in UK shows overall prevalence of PPH is 10.8%. However, there was wide regional variation in PPH prevalence, ranging from 7.2% of women giving birth in Oceania to 25.7% in Africa. Just over 8% of women giving birth were estimated to suffer from PPH in both Latin America and Asia and prevalence was approximately 13% in Europe and in Northern America (11). A study done in North East India shows, postpartum hemorrhage accounts about 21.2 % of total maternal death and almost all postpartum hemorrhage died within 24 hours of admission (12). Hospital based study in Pakistan shows, frequency of primary postpartum hemorrhage is 18.6%. Among patients who developed PPH, uterine atony was the most common cause 57.6%, followed by genital tract tears which was 29.2%.(13). Another study done in India shows that, the most common causes of postpartum hemorrhage was uterine atony which contributed to 33.91% followed by retained placenta 7.82% and genital tract trauma 4.34%(14). A case control study done in Benghazi, found the most frequent cause of PPH was due to uterine atony, which represented 50.3% of cases followed by genital trauma in 32.7%, retained placenta in 15% and increased in blood transfusions in 28.1% of cases and hysterectomy was performed in 2.6% of cases. From total cases of PPH 24.8% of patients were delivered by cesarean section compared to 68.6% who delivered vaginally [15].The global incidence of primary postpartum hemorrhage has been estimated at 10.5% of live births, with a case fatality rate of 1 % (16). According to a systematic review the prevalence of PPH with ≥500 ml of blood loss was 10.5% in Africa, 8.9% in Latin America and Caribbean, 6.3% in North America and Europe, and 2.6% in Asia [17]. Age ≥35years (AOR: 2.16; 95% CI 1.26-3.72), residency (AOR: 2.43; 95% CI 1.29-4.56), preeclampsia/eclampsia (AOR: 7.54; 95% CI 2.54-22.44), peripartum severe anemia (AOR: 6.65; 95% CI 3.71-11.74),forceps/vacuum delivery (AOR: 2.63; 95%CI1.19-5.81) and birth weight≥4000gm (AOR: 2.54; 95%CI 1.26-5.10) were significantly associated with PPH maternal mortality [18]. A study done in Nigeria indicates that, primary postpartum hemorrhage with an incidence of 1.9%. Uterine atony (37.7%) was the

commonest cause of primary PPH which was closely followed by retained placenta and lower genital tract laceration which accounts 22.5% and 13.6% respectively. And the contribution of primary PPH to maternal mortality was 4.2% during the study period [19]. Another retrospective study in Nigeria indicates that the prevalence of PPH was 1.6, 3.9 and 3.4% in the tertiary, secondary and primary health care institutions respectively. Retained placenta and retained placental bits of tissue were major causes of PPH (52.4%). Major risk factors identified were multiple gestation (20%), antepartum hemorrhage (15%) and previous PPH (12.5%)[20]. A prospective cohort study conducted in Uganda shows the overall incidence of postpartum hemorrhage was 9.0%, and of severe postpartum hemorrhage (1500mlsor more) was 1.2%. The risk factors for PPH were induction/augmentation of labor, multiple pregnancy, delivery by cesarean section and delivering a macrosomic baby [21].A Hospital based prospective cross-sectional study done in Sudan shows an incidence rate of PPH 0.5% of these majority were primary postpartum hemorrhage (84.2%) and the major cause of postpartum hemorrhage is uterine atony (36.85%) followed by retained placenta (31.6%) and birth canal trauma (23.7%). In the same study, while risk factors are absent in 47.4%, grandmultiparity and operative delivery might have a role in development of postpartum hemorrhage in this study. Other risk factors among the studied group were prolonged labor 11 %, over distension of the uterus 11% and others were 14 %[22]. Another retrospective Hospital based study done in Dareselam shows the prevalence of PPH was 11.9% and the risk factors for PPH found in this study are low hemoglobin (HB), pregnancy induced hypertension (PIH), trauma after delivery, history of birth before arrival (BBA), advanced age group (>32years old) and multiparty (> 3 parity)[23]. A retrospective study on outcome of management of massive postpartum hemorrhage in UK showed that among 114 cases of primary PPH; haemostasis was achieved in 63(66.3%) women via use of additional oxytocin;19(20.0%) via suture of tears; 10(10.5%) via manual removal of placenta; 1(1.1%) via systemic devascularisation; and 1(1.1%) via subtotal/total hysterectomy (24). A Hospital based retrospective cross-sectional study conducted at black lion hospital shows, the magnitude of PPH was 1.4% with the main causes of uterine atony (22.5%) and genital tract tear (15%) (25). A study done in Dire Dawa on maternal death and factors affecting maternal death; shows that the direct obstetric causes were responsible for 91% of deaths, of which PPH 27% , hypertensive disorders of pregnancy 22% and obstructed labor 18% are the leading causes (26).

2.2   Conceptual Frameworks

ANTENATAL FACTORS

- ➢ Previous PPH
- ➢ Anemia during pregnancy
- ➢ multiparty
- ➢ multiple pregnancy
- ➢ previous c/s
- ➢ Polyhydraminous

SOCIO-DEMOGRAPHIC FACTORS

- ➢ Age
- ➢ Religion
- ➢ Ethnicity
- ➢ Educational level
- ➢ Residency

PPH

INTERA-PARTUM FACTORS

- ➢ Tears
- ➢ Prolong labor
- ➢ Atony
- ➢ Induction/ augmentation
- ➢ Mode of delivery
- ➢ Macrosomic baby

PPH MANAGEMENT

- ➢ Iv fluid resuscitation
- ➢ Medication
- ➢ Surgery
- ➢ Blood transfusion

MANAGEMENT OUTCOME

- ➢ Improved
- ➢ Died

Figure 1: Conceptual framework of the study adopted from World Health Organization, 2009

CHAPTER THREE- OBJECTIVES

3.1 General Objective

- To determine the prevalence, causes and maternal outcome of primary PPH at Attat primary Hospital, from January 1 to June 30, 2017.

3.2 Specific Objectives

- To assess the prevalence of primary PPH at Attat Hospital, from January to June 30/2017.
- To describe the causes of primary PPH at Attat Hospital, from January to June 30/2017,and
- To identify the immediate maternal outcome of primary PPH at Attat Hospital from January to June 30/2017.
- To identify associated factors of management outcome of primary PPH at Attat Hospital from January to June 30/2017.

CHAPTER FOUR-METHODOLOGY

4.1   Study area

The study was conducted at Attat Primary Hospital, Gurage Zone, SNNPR Ethiopia; which is 175 kilometers from Addis Ababa and 254kilometers from regional city Hawassa.The climate is weyna dega, teff and inset are the main agricultural product. They also reared domestic animals like cow and got.

The Hospital was established in 1961E.C by Catholic Missionaries and still now governed   by them. The catchment population is 800,000, of which 51.2% females   and 48.8 % males. The Zone has 40 Health Centers and 2 newly established Primary Hospitals which are government owned, and all referred to this Hospital. It is one of affiliated hospital for training of IEOS students in conjunctions with Jimma University. This Hospital has 100 beds including delivery room, which give services for parturient mothers and other patients. The hospital has multidisciplinary staffs (Gynecologist, General Surgeon, General practiciniare, emergency surgeon, Pharmacist, Radiographer, Lab Technologist, midwives and clinical nurses).Through all the days of week the services are provided free of charge for all laboringmothers.

4.2   Study design and Period

This was a hospital based cross-sectional study that carried out at Attat primary hospital in the period between 1st January to 30th June 2017.

4.3   Source population

All mothers who gave birth at Attat Primary Hospital, during the study period.

4.4   Study population

All mothers who were diagnosed for Primary PPH and will be managed at Attat Primary Hospital during the study period.

4.5   Study units

Individual mothers who were interviewed for this particular research.

4.6   Sample size determination

All mothers who gave birth in Attat primary Hospital from January 1 to June 30, 2017 were diagnosed and treated for primary PPH were my total sample size.

4.7   Sampling technique

By non-probability sampling technique, all mothers who were diagnosed for primary PPH during the study period that were met the inclusion criteria were included in the study.

4.8   Inclusion and exclusion criteria

4.8.1 Inclusion criteria

All mothers

- ✓ With primary PPH.
- ✓ Delivered at Hospital.

4.8.2 Exclusion criteria

- All mothers delivered at Health Centers and referred to Hospital with diagnosis of PPH
- Mothers delivered at home and come to Hospital with bleeding were not included

4.9   Study Variables

4.9.1 Independent variables

Socio-demographic variables: age, educational level, occupational status, residency

Antenatal risk factors: ANC follow up, anemia during pregnancy, pollyhydramnios, chorioamnionitis, multiple pregnancy, APH, multiparty, Hypertensive disorder of pregnancy, previous history of PPH, and previous history of cesarean delivery

Intrapartum risk factors: Induction/augmentation of labor, mode of delivery, prolonged labor.

4.9.2 Dependent variables

- Management outcome

4.10   Data collection instrument and technique

A semi-structured questionnaire was adopted from different literatures and the necessary adjustment was made to fit the local condition. The main content of the questionnaire were Socio-demographic characteristics, Antenatal and Intrapartum risk factors, management given and outcomes.

4.11   Data collection procedure

Data was collected from patient interview, record cards, registration books and anesthesia charts available in the hospital using check list questionnaires by trained data collectors. The health providers in the delivery room were trained on data collection procedure and on measurement of postpartum blood loss. During enrollment, interviewers administered questionnaires to collect data on the risk factors including: previous history of PPH, previous history of cesarean delivery, woman's age in completed years, parity, and hemoglobin during ANC obtained from patient records. Participants' hemoglobin levels was determined during admission. Gestational age at birth was calculated from self-report of last normal menstrual period (LNMP), based on early ultrasound scan estimation (if available), history of amenorrhea or fundal height estimation. The research team noted whether labor was induced or augmented with oxytocin, the mode of delivery, performance of episiotomy, perennial tear requiring suture, single or multiple deliveries, pollyhydramnios, use of oxytocin at birth to prevent PPH within 1 min of delivery. Birth weight measured using mechanical baby weight scale. In women who delivered vaginally, postpartum blood loss was measured using a calibrated plastic jack from under-buttocks bio-hazard plastic drape. After delivery of the baby and clamping of the umbilical cord, a plastic drape was placed under the woman's buttocks. Blood allowed to flow into the drape until the attending midwife felt that the flow of blood is inconsequential. The total blood loss collected in the calibrated plastic established by the attending midwife. The blood pressure and pulse rate were recorded. In women who delivered by cesarean section, we relied on the visual estimation of blood loss (number of packs & gauze socked, blood collected in suction bottle) by the operator clinician. First patient interviewed then finally documents from patient cards entered in to a structured format by pretrained 2nd year IEOS students and midwives working in the labor ward.

4.12 Data processing and management

The collected data was reviewed and checked for completeness before data entry. Complete data entered in to SPSS version 21. Descriptive analysis like; frequency, mean and percentage and binary logistic regression analysis were done and the analyzed data was presented using tables, graphs, pie-chart and written paragraph forms.

4.13 Data quality assurance

The quality of data were controlled starting from the time of data collection. Then, collected data was cleaned and cross checked for its completeness and internal consistency by the data collectors followed by data entry. To maintain the quality of the study, expert advice of data collection, data clearing and editing, strict supervision of data investigators and commenting the problems at spot were made by supervisor.

4.14 Ethical consideration

The ethical issue of this study was approved by the ethical committee of Jimma University Collage of Public Health and Medical Sciences and official permission to undertake the study obtained from Attat Primary Hospital. The purpose of the study was informed and verbal consent was obtained from mothers. Confidentiality of patient's information was assured.

4.15 Dissemination of results

The result of the study will be submitted to Jimma University College of Public Health and Medical Sciences, research coordinating office, and department of IEOS; and it also disseminated to Attat primary Hospital, Gurage zonal health department, and to Non-Governmental Organizations working on this area. Further attempt will be made to publish it on national and international scientific journal.

4.16 Operational definitions

Post-partum hemorrhage- Blood loss in excess of

- 500mlor more following vaginal delivery

- 1000ml or more following cesarean section

- Clinically change in vital signs, pallor and/ or the need for blood transfusion and for this particular study it will be obtained from estimated blood loss, vital signs of mother and determined hemoglobin value.

Uterine atony-lack of effective contraction of the uterus after delivery and will be obtained by examine the case.

Maternal death- Death of mother related to primary PPH and its complication.

Maternal outcome-Maternal condition after PPH which can be dead or improved within 24hours of postpartum period.

Precipitated labor- delivery of the foetus in <3hrs from the onset of labor diagnosed by history and follow up in the labor ward

Prolonged labor-labor which lasts >18hrs; diagnosed by history and follow up in the labor ward

Macrosomia – singleton birth weight ≥ 4000gm diagnosed by taking weight of new born

Polyhydramnios- amniotic fluid index (AFI) ≥25 cm or single deepest pocket ≥8cm diagnosed by obstetric ultrasound

Active Third Stage Management- managing third stage actively (giving oxytocin 10IU IM with in one minute of delivery, clamping and applying controlled cord traction and observing and uterine massage).

CHAPTER FIVE- RESULTS

5.1 Socio-Demographic Characteristics and Obstetric History

During the study period a total of 1786 mothers were delivered, of which 1340 were delivered vaginally whereas the rest 446 were delivered by cesarean section. The total number of subjects in this study were 105, those majority were from rural (68.6%). The majority of cases 73.3% were above the age of 25 years with the mean age of 28.7 with standard deviation of ±5.4 years. Among the study subjects 92.4% of them were married, 43.8% were illiterate with their educational level and 61% were house wives (table 1).

Table 1. Frequency distributions of study cases of primary postpartum hemorrhage in Attat Hospital, according to Socio-demographic characteristics: January 1-June 30/2017.

Socio-demographic characteristics		Frequency	%
Age category	<20	3	2.9
	20-24	25	23.8
	25-29	27	25.7
	30-34	25	23.8
	>=35	25	23.8
Ethnicity	Gurage	83	79.0
	Amara	15	14.3
	Oromo	7	6.7
Religion	Muslim	50	47.6
	Orthodox	49	46.7
	Protestant	5	4.8
	Others	1	0.9
Residency	Rural	72	68.6
	Urban	33	31.4
Marital status	Married	97	92.4
	Unmarried	8	7.6

Educational level	Illiterate	46	43.8
	Primary(Grade 1-8)	37	35.2
	Secondary(Grade9-12)	9	8.6
	Tertiary education	13	12.4
Occupational status	House wife	64	61
	Merchant	22	21
	Government employed	11	10.5
	Others(student, daily laborer)	8	7.6

Regarding to their obstetric history, 65.7% of cases were multipara and 34.3% were Primipara. About 60% of cases had gestational age of 39 to 42 weeks (full term) and 23.8% had gestational age of 37 to 39weeks (early term). Among the study cases 95% of them had ANC follow up of those 82% had four and above ANC visits (table 2).

Table 2- Frequency distribution of PPH cases according to obstetric history in Attat Hospital January 1-June 30/2017.

Obstetrics history		frequency	%
Parity	Primipara (Para-I)	36	34.3
	Multipara (P-II to P-IV)	44	41.9
	Grand multipara(>=P-V)	25	23.8
Gestational age (weeks)	Early preterm (28 to <34 weeks)	2	1.9
	Late preterm (34 to <37 weeks	6	5.7
	Early term (37 to <39 weeks)	25	23.8
	Full term (39 to <42 weeks)	63	60
	Post term (>=42weeks)	2	1.9
	Unknown LNMP had no early U/S	7	6.7
Ante Natal Care	Yes (booked)	100	95.2
	No (not booked)	5	4.8

5.2   Antepartum and Intrapartum Risk Factors

Among the study cases; 16.2% of mothers had previous history of postpartum hemorrhage, 14.3% had history of cesarean delivery and 12.4% of cases had multiple gestation in current pregnancy. Other identified risk factors were anemia during pregnancy, preeclampsia/eclampsia, Pollyhydramnios and antepartum hemorrhage contributes 10.5%, 10.5%, 3.8% and 2.9% respectively (Table 3).

Table 3- Antepartum risk factors identified among PPH cases in Attat Primary Hospital, January 1-June 30/2017.

Risk factors	Frequency	Percent (%)
Antepartum hemorrhage	3	2.9
Hypertensive disorder (Preeclampsia/eclampsia)	11	10.5
Multiple gestation of current pregnancy	13	12.4
Pollyhydramnios	4	3.8
Anemia	11	10.5
Intra uterine fetal death	10	9.5
Previous caesarean delivery	15	14.3
Previous history of postpartum hemorrhage	17	16.2

Of the identified intrapartum risk factors of postpartum hemorrhage, among the study cases 39.1% had history of prolonged labor and one mother had history of precipitated labor. Regarding onset and progression of labor 31.4% mothers were induced/augmented. Eight mothers or 7.6% had history of chorioamnionitis. Regarding to their mode of delivery; 21% were delivered by cesarean section and 79% were delivered vaginally of them 32.5% were delivered by assisted vacuum/forceps, 4 mothers were delivered vaginally with episiotomy/tear and 3 of them were destructive delivery. According to birth weight only 4 of singletons had birth weight of >4000gm (macrosomic) (Table 4).

Table 4- Intrapartum risk factors for primary postpartum hemorrhage cases in Attat primary Hospital January 1-June 30/2017.

Intrapartum risk factors		frequency	Percent (%)
Duration of labor	Precipitated labor (<3 hrs)	1	0.9
	Prolonged labor (>18hrs)	41	39.1
	Chorioamnionitis	8	7.6
	Induction/augmentation	33	31.4
Mode of delivery	Vaginal with vacuum/forceps assisted	27	32.5
	Vaginally with episiotomy extension/tear	4	4.8
	Distractive delivery	3	3.6
	Cesarean delivery	22	21
Birth weight(gram)	<2500 gm	8	8.6
	2500-3999 gm	81	87.1
	>=4000 gm	4	4.3

5.3   Causes of Current Postpartum Hemorrhage

Among 105 study cases of primary postpartum hemorrhage, the most frequent cause of PPH was due to uterine atony which represented 67.6% of cases followed by retained placenta in 17.1% and genital tract laceration/trauma in 15.2% of cases (Fig 2).
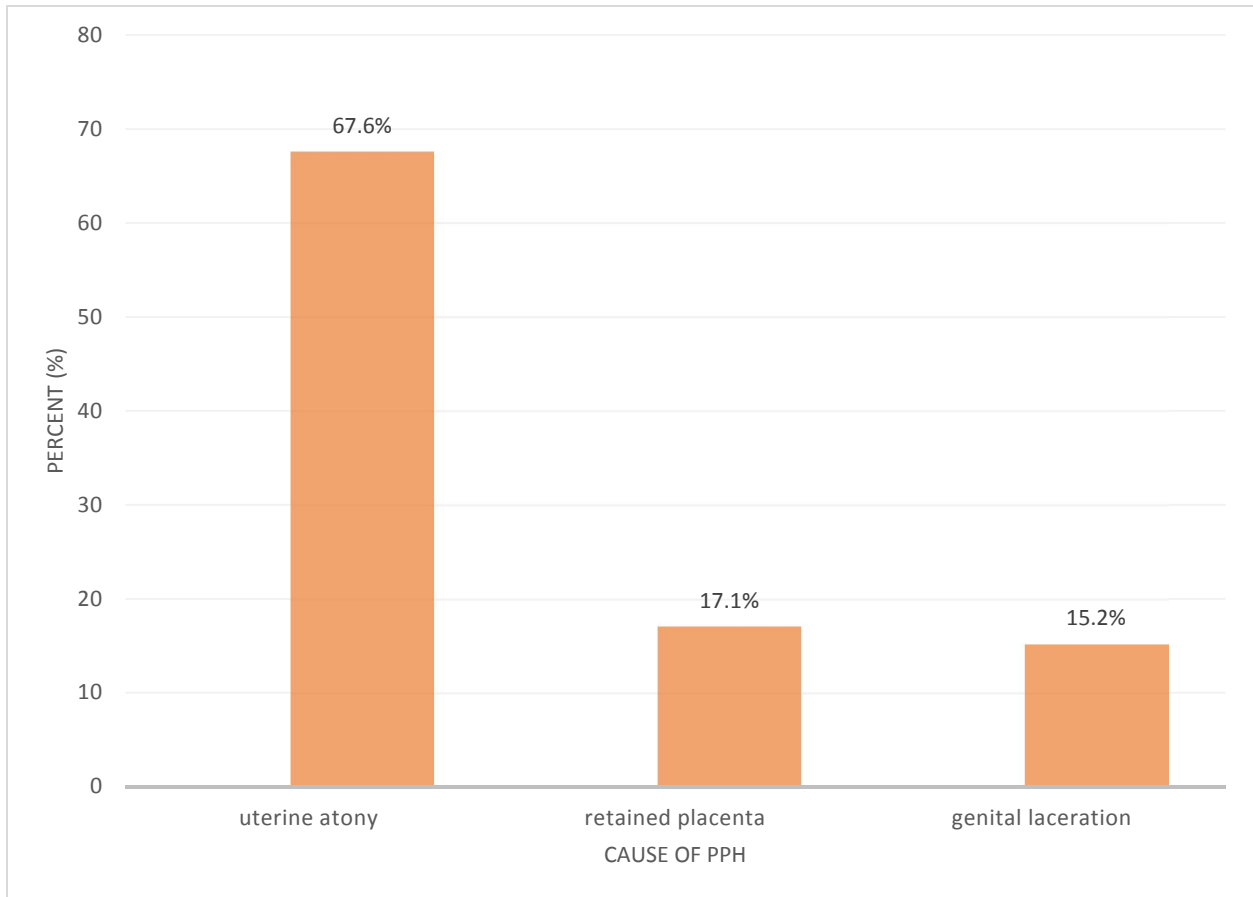

Figure 2: Causes of primary postpartum hemorrhage in Attat primary Hospital, January 1-June 30/ 2017.

5.4 Condition of Mother at Initial Evaluation for Postpartum Hemorrhage

During initial assessment for primary postpartum hemorrhage, depending on their blood pressure 46.7% had blood pressure of below 90/60mmHg, 42.9% had blood pressure of more than 90/60 mmHg and about 10.5% had unrecordable blood pressure. Regarding to their pulse rate 63.8% had pulse rate of 100-120beats per minute, 24.8% of them had 60-100 beat per minute and 11.4% had feeble pulse or undetectable. According to their estimated blood lose;51.4% had sever primary PPH (>=1500ml of blood loss),35.3% of cases had blood loss of 1000-1500ml while the rest 13.3% had blood loss of 500ml - 1000ml with the mean blood loss of 1459.52 ml and standard deviation of ±459.66. Regarding to their hemoglobin at initial evaluation for postpartum hemorrhage, 29.5% of cases had <7 gm/dl that blood transfusion needed and 70.5 % had Hemoglobin of 7-11.5mg/dl (moderate anemia) (Table 5).

Table 5- General condition of cases during initial assessment for primary PPH in Attat primary Hospital, January 1-June30/2017.

Parameters		Frequency	%
Blood pressure (mmHg)	Unrecordable	11	10.4
	Below 90/60	49	46.7
	>=90/60	45	42.9
Pulse rate	Feeble/undetectable	12	11.4
	100-120 bpm	67	63.8
	60-100 bpm	26	24.8
Estimated blood loss(ml)	500-1000 ml	14	13.3
	1000-1500 ml	37	35.3
	>=1500 ml	54	51.4
Hemoglobin (gm/dl)	<7 gm/dl	31	29.5
	7-11.5gm/dl	74	70.5
General condition of mother at initial evaluation	In shock	61	58.1
	Stable	44	41.9

5.5 Management Given For Postpartum Hemorrhage

According to the management given for primary postpartum hemorrhage, all cases were given intravenous crystalloid; 83.8% of cases were treated with uterotonics agent (oxytocin, misoprostol, ergometrine), for 17.1% of cases manual removal of placenta was done, repair tear/extension was done for 16.2% of cases, for two cases hysterectomy was done and 29.5% of cases were transfused with whole blood in addition to intravenous crystalloid (Fig 3).
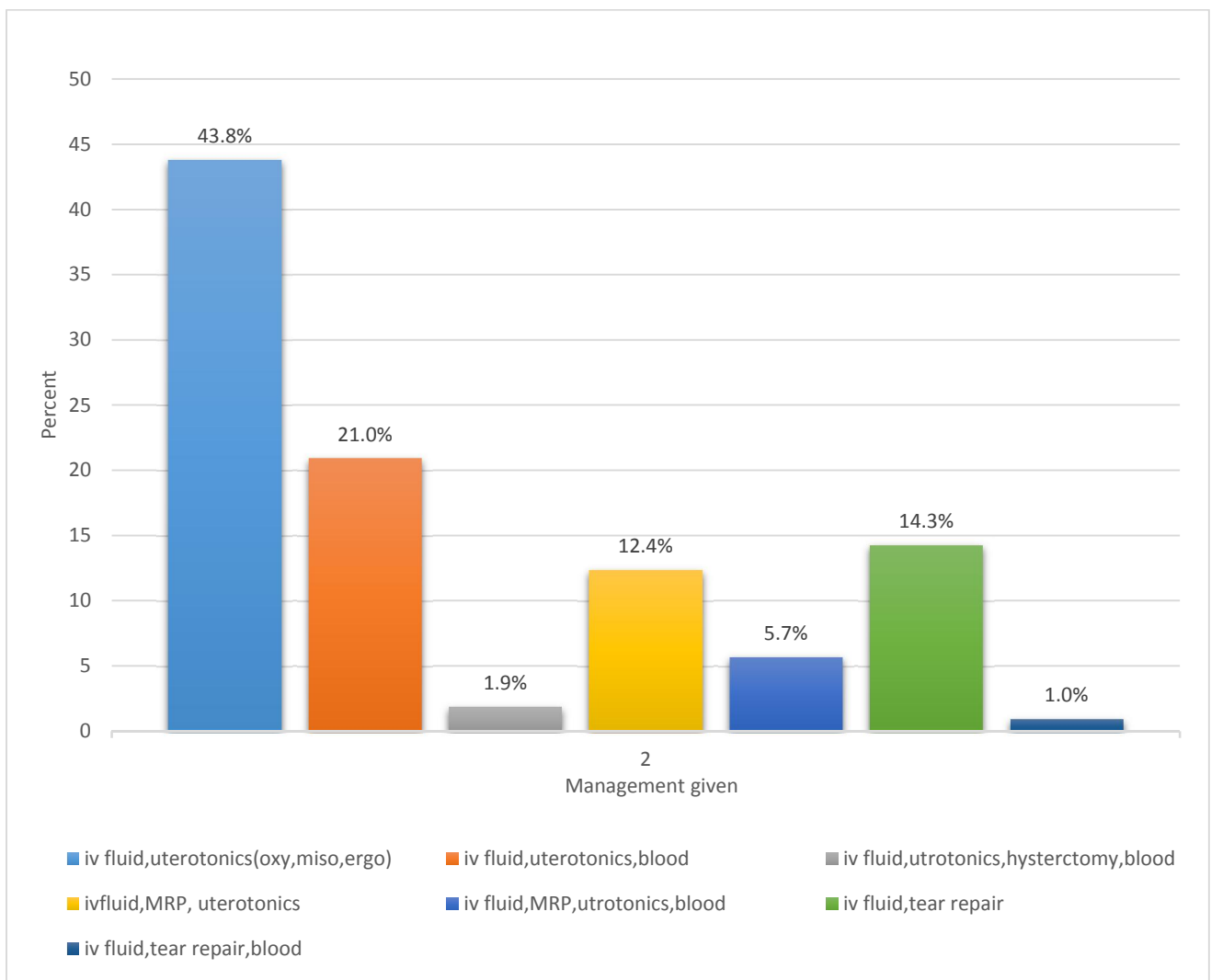
Figure 3- Management given for mothers who develop primary postpartum hemorrhage in Attat Primary Hospital; January 1– June30/2017.

5.6   Immediate Maternal Outcome of Primary Postpartum Hemorrhage

According to the immediate management outcome of mothers treated for primary postpartum hemorrhage, 96.2% were improved while 4 mothers were died which makes maternal mortality ratio of 213/100, 000 live births from primary postpartum hemorrhage (Figure 3).
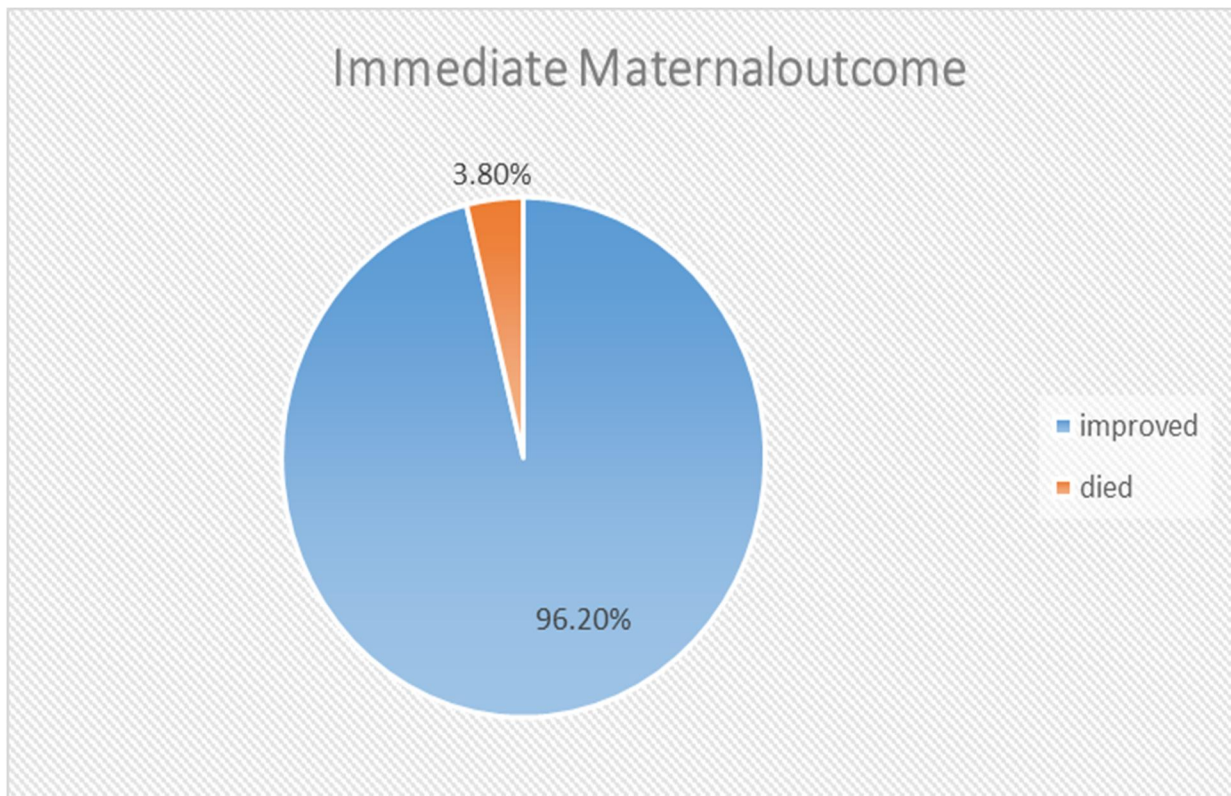

Figure 4- Immediate maternal outcome of primary postpartum hemorrhage in Attat primary Hospital; January1-June30/ 2017.

5.7 Associated Factors of Maternal Management Outcome

As shown from binary logistic regression analysis; the study showed that mothers who had anemia during pregnancy had seven fold risk of mortality from primary PPH (AOR 6.84; 95% CI 1.41-15.55), mothers who had multiple pregnancy had six fold risk of mortality from primary PPH (AOR 6.41; 95% CI 3.92-10.46), those mothers who had HDP had 19 fold risk of mortality from primary PPH (AOR 18.58; 95% CI 1.02-33.72), and mothers who had history of previous C/D had a risk of 19 times dying from primary PPH (AOR 19.45; 95% CI 1.28-29.55) as compared to those who had no such antenatal risks. However, Sociodemographic variables like age, residency, and intrapartum risk factors like induction/augmentation of labor, prolonged labor and mode of delivery had no significance association with management outcome of primary PPH in this study (table 6).

Table 6: Logistic regression analysis of Socio-demographic characteristics, antenatal risk factors and intrapartum risk factors with maternal outcome; in Attat Primary Hospital; January1-June30/2017.

Variables	Immediate Maternal outcome		OR (95% CI)	AOR (95% CI)
Socio-demographic variables	Alive	Died		
Age (year): <20	3(2.9%)	0		
20-29	49(46.7%	3(2.9%)	3.0 (0.3-29.8)	
≥30	49(46.7%)	1(0.9%)		
Residency: urban	29(27.6%)	2(1.9%)		
Rural	70(66.7%)	2(1.9%)	2.26(0.30-16.77)	
Antenatal risk factors				
Anemia : Yes	9(8.6%)	2(1.9%)		
No	92(87.6%)	2(1.9%)	10.22(1.28-81.50)	6.84(1.41-11.55)*
Multiple pregnancy: Yes	11(10.5%)	2(1.9%)		
No	90(85.7%)	2(1.9%)	8.18(1.05-64.04)	6.41(3.92-10.46)*
Preeclampsia/eclampsia: Yes	9(8.6%)	2(1.9%)		
No	92(87.6%)	2(1.9%)	10.22(1.28-81.50)	18.58(1.03-33.72)*

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Previous C/D: Yes	12(11.4%)	3(2.9%)	22.25(2.14-23.14)	19.45(1.28-29.55)*
No	89(84.8%)	1(0.9%)		
APH: Yes	3(2.8%)	0	0.000	
No	98(93.3%)	4(3.8%)		
Previous history of PPH: Yes	16(15.3%)	1(0.9%)	1.77(0.18-18.12)	
No	85(80.9%)	3(2.9%)		
Intrapartum risks				
Induction/augmentation: Yes	33(31.4%)	1(0.9%)	0.69(0.07-6.86)	
No	68(64.8%)	3(2.9%)		
Prolonged labor : Yes	40(38.1%)	1(0.9%)	1.97(0.19-19.58)	
No	61(58.1%)	3(2.9%)		
Mode of delivery: Vaginal	80(76.2%)	3(2.9%)	0.79(0.08-7.96)	
C/D	21(20.0%)	1(0.9%0		
Condition of mother at initial assessment				
Pulse rate: Feeble	9(8.6%)	3(2.9%)	0.045(0.004-0.485)	4.12(0.76-22.28)
100-120 bpm	66(62.8%)	1(0.9%)		
60-100 bpm	26(24.8%)	0		
Amount blood loss: 500-1000ml	14(13.3%)	0	0.0000	
1000-1500ml	37(35.2%)	0		
≥1500ml	50(47.6%)	4(3.8%)		

 AOR- Adjusted Odd Ratio

CHAPTER SIX-DISCUSSION

This study showed that prevalence of primary PPH in Attat primary Hospital during the study period was found to be 5.9%.It is much lower than the result of a hospital based study done in Pakistan which showed that the prevalence of primary PPH was 18.6% [13]. It also lower than to another retrospective hospital based study done in Dareselam that showed the overall prevalence of PPH was 11.9% [23]. This could be due to active third stage management was given for all mothers delivered in the Hospital. However this result was higher than a study done in Nigeria that indicates, primary postpartum hemorrhage with an incidence of 1.9% (19).It also higher than when it compared with a retrospective study done in Addis Ababa, Black Lion Hospital that showed the prevalence of PPH was 1.2% (25).

About 3.8 % of maternal deaths in the present study are attributed to primary PPH. This figure is comparable to a study done in Nigeria showed that the contribution of primary PPH to maternal mortality was 4.2% during the study period [19]. However this result is much lower than a study done in North East India that showed PPH accounts 21.2% of total maternal death (12). It also much lower than a study done in Derie Dawa which showed that PPH is responsible to 27% of maternal death (26).

The present study showed that from total cases of PPH 21% of cases were delivered by cesarean section compared to 79% who delivered vaginally.This is comparable to a study done in Benghazi, Libya showed that from total cases of PPH 24.8% of patients were delivered by cesarean section compared to 68.6% who delivered vaginally (15).

Among 105 cases of primary postpartum hemorrhage, this study showed that most frequent causes of PPH were due to uterine atony, in 67.6% of cases followed by retained placenta and genital tract laceration in 17.1% and 15.2% of cases respectively. This is comparable to a study done in Pakistan; among patients who developed PPH, uterine atony was the most common cause 57.6%, followed by genital tract tears which was 29.2% (13). It also comparable to another study done in India showed that, the most common causes of postpartum hemorrhage was uterine atony which contributed to 33.91% followed by retained placenta 7.82% and genital tract trauma 4.34%[14].

Previous cesarean delivery, multiple gestation, hypertensive disorder of pregnancy, and anemia during pregnancy were identified risk factors in this study which is consistent to study done in Dare Selam showed low hemoglobin during pregnancy, and pregnancy induced hypertension were risk factors for PPH. It is also similar with studies done in Nigeria, Uganda and South Sudan which showed that identified risk factors for PPH were multiple pregnancy, antepartum hemorrhage, previous history of PPH, delivered by cesarean section and induction/augmentation of labor [20, 21, and 22].

In this study most of cases (83.8%) were treated with uterotonics, in 17.1% manual removal of placenta was done, in 15.3% of cases suture of tear/extension, and hysterectomy was done 2(1.9%) cases. This is comparable to a study done in UK showed that among 114 primary PPH cases haemostasis was achieved in 66.3% women via use of additional oxytocin; 20.0% via sutures of tears; 10.0% via manual removal of placenta; and 1.1% via subtotal/total hysterectomy [24].The present study also demonstrated increased in blood transfusions in 29.5% of cases and hysterectomy was done for 2 cases (1.9%),which is comparable to a study in Benghazi showed that increased in blood transfusions in 28.1% of cases and hysterectomy was performed in 2.6% of cases [15].

In logistic regression anemia during pregnancy (AOR 6.84; 95% CI 1.41-15.55), multiple pregnancy (AOR 6.41; 95% CI 3.92-10.46), hypertensive disorder of pregnancy (AOR 18.58; 95% CI 1.02-33.72), and history of previous C/D (AOR 19.45; 95% CI 1.28-29.55) were positively associated with risk of maternal death under PPH. The increased risk of maternal death among mothers who had hypertensive disorders of pregnancy and severe anemia during pregnancy has also been documented in previous study. However, age over 35, residency (rural), birth weight over 4000gm and vacuum/forceps delivery which were positive associated in the past study not significant associated in this study [18].

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

The prevalence of primary postpartum hemorrhage in this study was 5.9% and maternal death due to PPH was 3.8%. The most common Causes of postpartum hemorrhage were; Atonic uterus, retained placenta, and genital trauma. Blood transfusion rate was 29.5% and hysterectomy was done for **two** cases. Anemia during pregnancy, hypertensive disorder of pregnancy, previous history of cesareandelivery; and multiple gestation were significantly associated with immediate maternal outcome.

7.2 RECOMMENDATION

- The prevalence of PPH in Attat Hospital is still higher as compared to the WHO survey report; so the Hospital needs more attention for the intervention of PPH cases.

- Risk factors associated for increasing maternal death from PPH like anemia during pregnancy, and hypertensive disorder of pregnancy should be identified and treated early during pregnancy.

- Effort should be put on improving capacity of blood bank and making blood quickly accessible when needed in the Hospital.

- Furthermore, well designed, large and multi-centric studies are needed.

7.3   LIMITATIONS OF THE STUDY

- Challenges to accurate measurement of blood loss because, sometimes blood socked with clothes or splashed over the ground.
- Sometimes mothers were discharged to home before 24hrs during postpartum period which resulted in missing the cases.
- This research didn't show the long term complication of postpartum hemorrhage.
- Because this study was facility based, it might not represent the community's problem.

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Dummy Table

Sociodemographic character	Category	Frequency	Percent
Age of mother	<20		
	20-24		
	25-29		
	30-34		
	>=35		
Ethnicity	Gurage		
	Oromo		
	Amara		
	Others		
Religion	Muslim		
	Orthodox		
	Protestant		
	Others		
Residency	Urban		
	Rural		
Educational level	Illiterate		
	Primary (Grade1-8)		
	Secondary (Grade 9-12)		
	Tertiary/higher education		

Occupational status	House wife		
	Government employed		
	Merchant		
	Others		
Obstetrics History			
Parity	Primipara		
	Multipara (2-4)		
	Grand multipara(>=5)		
Gestational age(weeks)	Early preterm(28 to <34)		
	Late preterm(34 to <37)		
	Early term (37 to <39)		
	Full term (39 to <42)		
	Post term (>=42)		
ANC follow up	Yes		
	No		
Number of ANC visits	Only 1x		
	2-3x		
	>=4x		
Antenatal risk factors			
History of caesarean delivery	Yes		
	No		

History of PPH	Yes		
	No		
APH	Yes		
	No		
Preeclampsia/eclampsia	Yes		
	No		
Multiple gestation	Yes		
	No		
Polyhydramnios	Yes		
	No		
Anemia during pregnancy	Yes		
	No		
Status of fetus	Alive		
	IUFD		
Intrapartum risk factors			
Chorioamnionitis	Yes		
	No		
Prolonged labor	Yes		
	No		
Induction/augmentation	Yes		
	No		

Mode of delivery	Vaginal		
	Caesarean section		
AMTSL given	Yes		
	No		
Causes of current PPH	Uterine atony		
	Retained placenta		
	Genital tract laceration		
	Others		
Condition of mother	Stable		
	Moribund/in shock		
Blood Pressure of mother	Unrecordable		
	<90/60		
	>=90/60		
Pulse rate of mother	Feeble/undetectable		
	100-120bpm		
	60-100bpm		
Estimated blood loss	500-1000ml		
	1000-1500ml		
	>=1500ml		
Hemoglobin	<7gm/dl		
	7-11.5gm/dl		
	>11.5		

Management given	Crystalloids		
	Uterotonic(oxytocin,miso,ergo)		
	Tear/extension repair		
	Manual removal of placenta		
	Hysterectomy		
	Blood transfusion		
Immediate Maternal outcome	Recover		
	Died		

Declaration

I, the undersigned, declare that the thesis is my original work, and has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

Declared by, Candidate

Name   <u>TEHAGER DERBEW</u>   (BSc)

Signature _____

Date   _____

This thesis has been declared for final submission with my internal examiner and advisors

Approval as university.

Name of the internal examiner _____

Signature _____

Date _____

Confirmed by, Advisor

1. DR <u>YESUF AHIMED</u> (MD, Assistant Professor and Consultant in Obstetrics & Gynecology)

Signature _____

Date _____

2. MR <u>LAMESSA DUBE</u> (BSC, MPHE Assistant Professor of Epidemiology)

Signature _____

Date _____