



**WOLLEGA UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
SCHOOL OF MEDICINE**

**ASSESSMENT OF BIRTH PREPAREDNESS , COMPLICATION
READINESS AND ASSOCIATED FACTORS AMONG PREGNANT
WOMEN ATTENDING ANTENATAL CARE AT WOLLEGA
UNIVERSITY COMPREHENSIVE SPECIALIZED HOSPITAL,
WESTERN ETHIOPIA, 2025 G.C**

By: Dr. Dugasa Erko Garbi (MD, Obstetrics and Gynecology Resident)

**MAY, 2026G.C
NEKEMTE, ETHIOPIA**



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**A RESEARCH PAPER TO BE SUBMITTED TO THE, INSTITUTE OF
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LIST OF ACRONYMS AND ABBREVIATIONS

ACOG	American College of Obstetricians and Gynecologists
AJOG	American Journal of Obstetricians and Gynecologists
ANC	Antenatal Care
AOR	Adjusted Odds Ratio
BeMOC	Basic Emergency Obstetric Care
BPCR	Birth preparedness and complication readiness
CHWs	Community Health Workers
COR	Crude Odds Ratio
C/S	Cesarean Section
EDHS	Ethiopian Demographic Health Survey
ETB	Ethiopian Birr
FMoH	Federal Minister of Health
GA	Gestational age
GYN/OBS	Gynecology and Obstetrics
JHPIEGO	John Hopkins Program for International Education in Obstetrics and Gynecology
MM	Maternal Mortality
MNM	Maternal and neonatal mortality
NICE	National Institute for Health and Care Excellence
NICU	Neonatal Intensive Care Unit
SB	Still birth
SDG	Sustainable Development Goals
WHO	World Health Organization
WUCSH	Wollega university comprehensive specialized hospital

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ABSTRACT

Background- Birth preparedness and complication readiness (BPCR) is a key strategy to improve timely utilization of skilled maternal and neonatal care by encouraging pregnant women and their families to plan for normal birth and anticipate complications. It plays a critical role in reducing the three delays associated with maternal mortality: delay in decision-making, delay in reaching care, and delay in receiving adequate care. Despite ongoing efforts, BPCR practice remains suboptimal in Ethiopia.

Objective - To assess the prevalence of birth preparedness , complication readiness and its associated factors among pregnant women attending antenatal care at Wollega University Comprehensive Specialized Hospital, Western Ethiopia, 2025.

Method - An institutional-based cross-sectional study was conducted among 342 pregnant women attending antenatal care. A systematic random sampling technique was used. Data were collected using a pretested interviewer-administered questionnaire. Data were entered into EpiData version 4.7 and analyzed using SPSS version 27. Bivariable and multivariable logistic regression analyses were performed to identify factors associated with BPCR. Variables with $p \leq 0.25$ in bivariable analysis were included in multivariable analysis. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were used, and statistical significance was declared at $p < 0.05$.

Results: Among 342 pregnant women, the prevalence of BPCR was 52.9% (95% CI: 47.5–62.7). Regarding its components, 297 (86.7%) planned to save money, 215 (63%) planned for place of delivery, and 185 (54.2%) planned to arrange transportation. However, only 91 (26.6%) planned to be attended by a skilled birth attendant , and 121 (35.3%) of them had awareness & knew means to access blood transfusion services, indicating gaps in critical birth preparedness & complication readiness practice. BPCR practice was significantly associated with several factors, including urban residence [AOR=6.72; 95% CI: 4.89 – 8.23], formal education [AOR=6.10; 95% CI: 4.56 – 8.12], being government employee [AOR=3.80; 95% CI: 2.34 – 5.12], small family size per household [1-3 person per household, AOR=2.50 ;95% CI:1.56 – 4.01], and absence of under-five child in the household [AOR=4.20, 95% CI: 2.89 – 6.12]. Also, women who had knowledge about pregnancy danger signs [AOR=3.50;

95% CI: 2.34 – 5.23] and those who had prior awareness of BPCR [AOR=2.64; 95% CI: 1.78 – 3.89] were more likely to practice BPCR. Additionally pregnant women who were in the middle and high household income group were likely prepared for BPCR than their counter parts, with adjusted odds ratio of [AOR=1.8; 95% CI: 1.34 - 2.34 & AOR=3.2; 95% CI: 2.34-4.56] respectively.

Conclusion: The prevalence of BPCR was moderate (52.9%) in the study area based on WHO recommendation that every pregnant women expected to prepare for child birth & its complications .It is comparable to studies done in similar study settings. Having formal education, high house hold income, smaller family size in household, being urban dwellers, being government employee, having knowledge of pregnancy danger signs, and hearing about BPCR significantly associated with BPCR practice. Strengthening antenatal counseling and targeted health education, particularly for rural and less-educated women, is essential to improve BPCR practices.

Keywords: Birth preparedness, complication readiness, antenatal care, maternal health, Ethiopia

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Birth preparedness and complication readiness (BPCR) is the preparation process for normal deliveries and anticipation of the required things in the event of an emergency. This includes finding out where they will give birth, identify a blood donor, and trained birth attendant. Identifying and choosing their means of transport if there is an emergency and saving money are also the main parts of birth preparedness and complication readiness [1].

Maternal mortality due to pregnancy and childbirth is a worldwide problem. Approximately 810 maternal deaths happen per day, or around 295,000 deaths per year around the world. Maternal mortality due to complications during pregnancy and childbirth decreased by 50% from an estimated 523,000 deaths in 1990 to 289,000 deaths in 2013. While this progress has been significant, the average annual rate of decrement is well below what is desired to attain the objective. The Sustainable Development Goals (SDGs) target 5.5% by 2030 [2]. Maternal mortality is more common in low-income and middle-income countries, with around 94% of maternal deaths occurring in these countries. In fact, approximately 66% of maternal deaths occurred in sub-Saharan countries. Therefore, the maternal mortality rate is approximately 216 per 100,000 live births worldwide and 542 per 100,000 live births in Africa. As a result, maternal mortality rates in low-income countries are almost 29 times higher than in high-income countries[3]. Ethiopia has made remarkable effort in enhancing maternal and children wellbeing. However, the healthcare system still faces considerable obstacles that hold high priority for the country. These challenges include underutilization of maternal health services, such as trained birth attendant and significant unmet demand for family planning; scarcity of accessible sexual and reproductive health services; inadequate awareness of healthy behaviors; as well as barriers and disparities in accessing and receiving quality health care[4].

In our country, around 15% of mothers and her newborn experience critical complications that need to be addressed by specialized healthcare facilities offering comprehensive emergency obstetric and neonatal care, including cesarean section, blood and emergency laparoscopic surgery[5]. It is crucial to have skilled medical personnel present during births, as this intervention plays a significant role in lowering maternal and child deaths [6] in high-income countries women's psychological and physical comfort is prioritized over birth planning and preparing for complications. However in low- and middle-income countries, emphasis must be placed on childbirth preparation and potential complications [7].

Maternal mortality trends show that Ethiopia is among the five countries responsible for more than half of all global maternal deaths. In 2016, it accounted for 412 maternal deaths per 100,000 live births. Majority of maternal deaths occur during and after childbirth. The highest proportion of direct maternal deaths was due to obstetric hemorrhage, followed by hypertensive disorders of pregnancy. High rates of maternal and neonatal mortality in low- and middle-income countries are caused by three delays. The first is the delay in decision to seek healthcare, second is the delay in arriving at health facility, and the third is the delay in receiving adequate treatment after arriving to health facility. Delays can be due to a variety of factors, including logistical and financial constraints, as well as a lack of awareness of maternal and neonatal health [8]. Therefore, essential measures to decrease death in mother and neonate include emergency obstetric management, qualified midwives, postpartum care, and postnatal care. Arranging emergency transportation can reduce these delays [9].

In health centers and hospitals at all levels in Ethiopia, women were briefed on pregnancy-specific complications such as severe headaches, abdominal pain, passage of liquor, vaginal bleeding and blurred vision during ANC contacts; but only half of pregnant women received the recommended minimum of four ANCs visits in developing countries [10]. An Ethiopian hospital survey conducted in 2011 found that the level of care in ANC, labor and delivery, and essential neonatal care was below internationally recognized standards. Only 40% of healthcare providers knew how to prevent, recognize and treat maternal complications [11].

The process of organizing for a successful delivery and anticipating the steps required in an emergency is known as Birth preparedness and complications readiness (BPCR). It aimed at addressing delays by enabling women, their families and communities to better plan childbirth and act in emergencies [12]. BPCR has the following elements: Saving money, identify potential blood donors, arranging transportation, identifying skilled birth attendant, be aware of obstetric danger signs and need to act immediately [1][13].

Research on women in the Robe, Goba, and Adigrat revealed extremely low levels of BPCR - 16.5, 29.9 and 22.1% - respectively [13][14][15]. Knowing the most critical obstetric warning signs is the crucial first step for women to recognize factors and seek appropriate emergency care [16][17]. On the other hand, little information is available about the causes of this low coverage in Ethiopia generally and in the study area in particular.

According to WHO, every pregnant woman needs a written BPCR plan, review it with a qualified delivery attendant at some stage in each ANC or at least a month prior to delivery [18]. Antenatal clinics in Wollega University comprehensive specialized hospital are managed by OBGYN seniors, residents, medical interns and midwives and follow 2016 WHO antenatal care model. The 2016 WHO ANC model has at least 8 contacts, which focuses on evidence-based interventions including BPCR for all women, in addition to giving care and support for women and their families. The literature's levels of BPCR are often modest and varied. Age, parity, education and other socio-economic elements, such as income, have been demonstrated to have an impact on BPCR. Social support elements like community, family and spouse support seem to have an impact on BPCR. Moreover, there are differences in the meaning of BPCR in the literature, which could explain why certain researches don't agree with each other.

In accordance with WHO's BPCR plan the following must be determined: the birth place, favored skilled birth attendant, area of suitable facility for delivery nearby, budget for birth or in case of emergencies, a companion during labor and birth, care at home after delivery, transport to a reach health delivery and in case of emergencies and donors of blood as required [19]. JHPIEGO's clearly outlines the duties of all parties involved, like legislators and members of community, making strategy more all-encompassing.

Some nations, including Nepal, have instituted birth preparedness cards, also called as ‘key chains,’ with messages on birth preparedness [20]. Ethiopia, Eritrea, Kenya, Uganda, and Tanzania covered domestic visits with the aid of volunteers to teach households on BPCR; educating health personnel to provide education and assistance on BPCR; the supply of visual aids and instructional materials on BPCR; and surveillance systems for pregnancies in community, are all regularly evaluated[12]. In addition doing home visits and community meetings, Community Health Workers in Rwanda also use mobile technology to repeat BPCR messages via SMS notifications [21].

So this study aims to advance our understanding on factors influencing pregnant women attending Antenatal Care at Wollega University comprehensive specialized hospital, Oromia, Ethiopia, 2025G.C, in terms of their BPCR in 2025G.C. In addition it helps to close the knowledge gap, offers potential advice for professionals, health managers, and other stake holders employed by maternity and child health facilities.

1.2. Statement of the Problem

One critical strategy for reducing maternal and neonatal mortality is enhancing Birth Preparedness and Complication Readiness (BPCR). BPCR is a comprehensive approach that involves planning for normal birth and anticipating the actions needed in case of complications. It encompasses identifying a skilled birth attendant, choosing a delivery facility, arranging transportation, saving money for potential expenses, and recognizing danger signs during pregnancy, childbirth, and the postpartum period [1]. BPCR is a key component of the WHO's Safe Motherhood Initiative and has been widely promoted as an essential element of antenatal care (ANC) services.

Despite the recognized importance of BPCR, studies indicate that the magnitudes of preparedness among pregnant women remains suboptimal in many parts of Ethiopia. For instance, a study conducted in Southern Ethiopia found that only 18.3% of pregnant women were well-prepared for birth and complications [24]. Similarly, a study in Arba Minch town revealed that just 30.6% of mothers were adequately prepared for delivery and emergency conditions[13]. Inadequate BPCR is linked to delays in seeking, reaching, and receiving appropriate care, which are key contributors to maternal deaths, as outlined in the “Three Delays” model [25].

Several factors influence the level of BPCR, including maternal education, occupation, parity, previous experience with obstetric complications, timing and frequency of ANC visits, and the provision of BPCR counseling during ANC sessions. A study conducted in Northern Ethiopia indicated that mothers with higher educational levels, those who attended four or more ANC visits, and those who were informed about danger signs were more likely to be well-prepared[26]. However, findings are not always consistent across regions, suggesting the importance of contextual factors such as access to healthcare, cultural beliefs, and the quality of ANC services.

Wollega University Comprehensive Specialized Hospital (WUCSH), located in Oromia Region, serves a large catchment area with diverse populations. Despite being a referral center with access to skilled healthcare providers and maternal services, anecdotal reports and clinical observations suggest that many women still arrive at the hospital without

adequate preparation for childbirth or knowledge of potential complications. This raises concerns about the effectiveness of BPCR interventions in the area and the quality of ANC counseling provided. There is currently a paucity of published data assessing the level of BPCR and associated factors among pregnant women attending ANC at WUCSH.

Without clear evidence on the magnitude of birth preparedness and the factors that influence it in this setting, it is difficult to design and implement targeted interventions aimed at improving maternal outcomes. Understanding these factors is essential for optimizing ANC services and reducing preventable maternal and neonatal deaths. Hence, this study seeks to assess the magnitude of birth preparedness, complication readiness and its associated factors among pregnant mothers attending ANC at Wollega University Comprehensive Specialized Hospital. The findings will help hospital policy makers, improve service delivery, and ultimately contribute to the reduction of maternal and neonatal morbidity and mortality in the region.

1.3. Significance of the Study

Understanding the factors that influence BPCR is crucial for improving child and maternal health. By identifying determinants, interventions can be designed to address specific barriers and promote better health practices throughout pregnancy, delivery and postnatal care. By studying the determinants, researchers can access the gaps in knowledge, resources, and access to care, which can then be addressed through targeted interventions. This can potentially lead to a decrease in preventable deaths related to pregnancy and childbirth. A study on the determinants of BPCR can provide valuable insights into the strengths and weaknesses of the healthcare system in Nekemte area. It can highlight areas of improvement, such as availability and accessibility of healthcare facilities, availability of skilled birth attendants, and availability of necessary medical supplies. This information can guide policymakers and healthcare providers in strengthening the health system to better meet the needs of pregnant women. Understanding the determinants of BPCR can empower pregnant women to take an active role in their own healthcare. By identifying the factors that influence their level of preparedness, women can be provided with the necessary information, skills, and resources to make informed choices about their ANC, facility –based delivery, and emergency preparedness. This can lead to improved self-efficacy and decision-making, ultimately promoting better health outcomes for both the mother and the newborn. This research can also contribute to the existing body of knowledge on this topic. It can provide context-specific insights and generate evidence that can be used to inform similar studies in other settings. This can ultimately contribute to a better understanding of the factors affecting BPCR globally and help in developing effective strategies and interventions to promote better maternal child health outcomes worldwide.

CHAPTER TWO

2. LITERATURE REVIEWS

2.1. Global Context of BPCR

A crucial component of safe motherhood is being ready for labor and all of its complications. This encourages visionary, health-seeking behaviors among pregnant mothers which are important in avoiding bad obstetric outcomes. Globally, maternal mortality remains a significant public health issue, with approximately 287,000 maternal deaths in 2020, the majority occurring in low-resource settings. Studies show low levels of BPCR, particularly in sub-Saharan Africa and South Asia contributing for this mortality. For instance, a study done in Nepal showed that only 32.4% and an Indian study shows that 47.8% [27] of women were well prepared for birth and complications.

2.2. Regional and National Context

In Africa, several studies highlight poor levels of BPCR. The research conducted in Nigeria, Uganda and, Tanzania, using nearly identical definitions for BPCR revealed that our nation's degree of BPCR was poor. Percentage of women prepared for child birth according to a study done in Nigeria by [28] were 34.9%. Likewise, , Ugandan report, 35% of them [29] , 87.4% reported by Tobin et al. in Nigeria [30] and 82.3% according [31] in Tanzania were well-prepared for birth and its complication management. So there are significant variations in different studies settings likely due to different study period and sample size, different socio-demographic traits and variations in the way the health care system is implemented .In Ethiopia, Local studies indicate varying levels of BPCR across regions.

The research conducted in different parts of Ethiopia revealed that level of BPCR was low when compared with each other & other countries. For example in Jimma zone, it revealed that the “practice of birth preparedness and complication readiness plan was found to be 23.3% [32], in Gondar 34% [33], Adigrat Town, 22.1% [24] ,in Mizan-Aman Town 22.2% [14] ,in Sidama, southern Ethiopia 17% by [16] , Wolayita Zone, Duguna Fango district 18.3% [34], inYirgalem General hospital 48.6%[51]and in Jarte, Horro Guduru Wollega only27.5% of them were well-preparedfor birth and its complication

management[35]. However, the practice of BPCR in Arsi zone was even lower than the studies in other parts of our countries 16.5% [15]. Similar results was seen also seen in Goba town [13]. Other studies in Addis Ababa and Dire-Dawa showed a higher BPCR rate (56.3% and 54.7%, respectively [36][37].

2.3. Factors Influencing BPCR

Multiple factors influence BPCR practices, including sociodemographic characteristics (age, education, and income), obstetric history (parity, ANC visits), and knowledge of danger signs, partner involvement, and health system factors. Studies have consistently shown that women with higher education levels, more ANC visits, and greater knowledge of danger signs are more likely to be well prepared. According to a research conducted in Gondar's Farta District, "21.4% of respondents gave birth to their last kid at a health facility. Approximately 79% of women had at least one ANC follow-up during their last pregnancy[33]. The result are in line with the findings of the 2024-25 EDHS, which revealed that "49.4% of rural women and 89.4% of urban women gave birth at a health facility, and 82% of women who delivered in the previous 5 years received at least once ANC follow-up [38]. Similarly in Nigerian, Northern part in which 21.9% of the women delivered their last child in a health facility and 75.5% of the them had at least one ANC visit [39].

In a recent study conducted in Jarte, Horro Guduru Wollega 28% of the repliers attend antenatal care at least once during their recent pregnancy[35]. Also, study done in Farta District, Gondar reported "mothers who have ANC follow-up during their previous pregnancy were 3.67 times more likely prepared for birth and its complication than those who had no ANC follow up visit [33]. The research conducted in Goba, Adigrat town and Robe woreda, Arsi zone also reveals comparable findings[13][15][24, 24].

Being an urban resident had a significant association with BPCR as research showed in Jarte, Horro Guduru Wollega "women who lived in urban areas were 5.94 times more likely to be prepared for childbirth and its complication than rural dwellers [35]. This finding is in line with the studies in Goba district and Sub- Saharan Africa [13][40] ; but contradicting a study conducted in Southern Nigeria where no difference in residence was observed [41].

In a study conducted in Jarte, Horro Guduru *Wollega.*, primiparous women were better prepared for childbirth and its complications compared to grand multiparous women [35]. This is in line with a study conducted in Duguna Fango, Wolayta Zone, Ethiopia and Uganda 53.9% of them were prepared [42]. An independent negative correlation has been found between birth preparedness and the presence of under-five child in the household during pregnancy of the recent delivery[34]; this may be due to the fact that women take care of her under-five child rather than preparing themselves for the coming delivery. This may indicate the need for teaching on family planning in line with the mothers' health.

The practice of BPCR was substantially correlated with knowledge of birth preparedness and danger signs in pregnancy, during and after childbirth. "Women who had knowledge of BPCR were 8.83 times more likely to be prepared for birth and its complication than their counterparts in a study done in Gondar, Farta District. Similarly, women who had knowledge about danger signs during pregnancy, during child birth and after childbirth were better prepared for birth and its complication" [33]). This is consistent with the studies conducted in Arsi, Guraghe Zone, Sub-Saharan Africa and Tanzania [15][31][43][44]. According to a study conducted in Nigeria only 44.9% and 36.9% of the respondents had sufficient knowledge of BPCR, respectively[45].

A study done in Mizan Aman town showed that mothers with income levels between 1001-1500 Birr/month were nearly three times more likely planned to give birth at the health facility and ready for any possible complications too. Thus, these results are in harmonious with studies conducted in Arsi Robe woreda, Ethiopia, Ogbomosho Nigeria and India [34][46]. A study done in Jarte, Horro Guduru Wollega found that about 29% of the study participants had a history of obstetric complication[35]. Women with a past obstetric complication were more likely to be well-prepared than those without complications in past. Similarly, a study conducted in Mizan Aman town showed that mothers with history of stillbirth were almost four times more likely to plan the place of birth and prepare for possible complications that could then arise [14]. This is also confirmed by research conducted in Farta District, Adigrat and Wolayta, Ethiopia.

A research conducted in Farta District found that a significant number of respondents were unaware about BPCR. According to a Mizan Aman town study, individuals who were aware of the danger signs of pregnancy were almost three times more likely to be well prepared for BPCR[14]. This is also confirmed by research conducted in Gurage Zone and Goba woreda [13][43].

According to a research done in the Farta District, more than 50% of the participants know where to go in case of emergency, made plans for transportation, communication means, and the preparation of required materials for child birth when asked 12 open-ended questions asked about elements of BPCR items [33]. This is in line with the research conducted in Robe woreda and Adigrat town [15][24]. Vaginal bleeding was identified by most women as the primary danger sign during pregnancy (49.1%), childbirth (52.8%), and the postpartum period. Similar results were reported in studies conducted in Aleta Wondo and Tsegedie districts [16][17]. Mothers who reported two or more postpartum danger signs were 3.571 more likely to be ready for BPCR according to a Mizan Aman Town study [14]. This aligns with research conducted in Arsi robe, Uganda and Nepal [15][29]. The literature reveals substantial gaps in BPCR practices, particularly in low-income countries. Understanding the associated factors is crucial for designing effective interventions. This study seeks to fill gaps in knowledge specific to the study area and contribute to improved maternal and neonatal outcomes.

2.4. Conceptual Framework

This study is guided by a conceptual framework adapted from the JHPIEGO BPCR model and Andersen's Behavioral Model of Health Services Use, which posits that health behavior is influenced by predisposing, enabling, and need factors. The framework illustrates the relationship between the independent variables (socio-demographic, knowledge and attitude, obstetric history, and health service utilization factors) and the dependent variable (BPCR practice).

The framework postulates that BPCR practice is directly influenced by a woman's knowledge and attitudes towards BPCR. Furthermore, socio-demographic factors, obstetric history, and health service utilization influence BPCR practice, both directly and by shaping her

knowledge and attitudes. The interrelationships among these factors are depicted in the figure below.

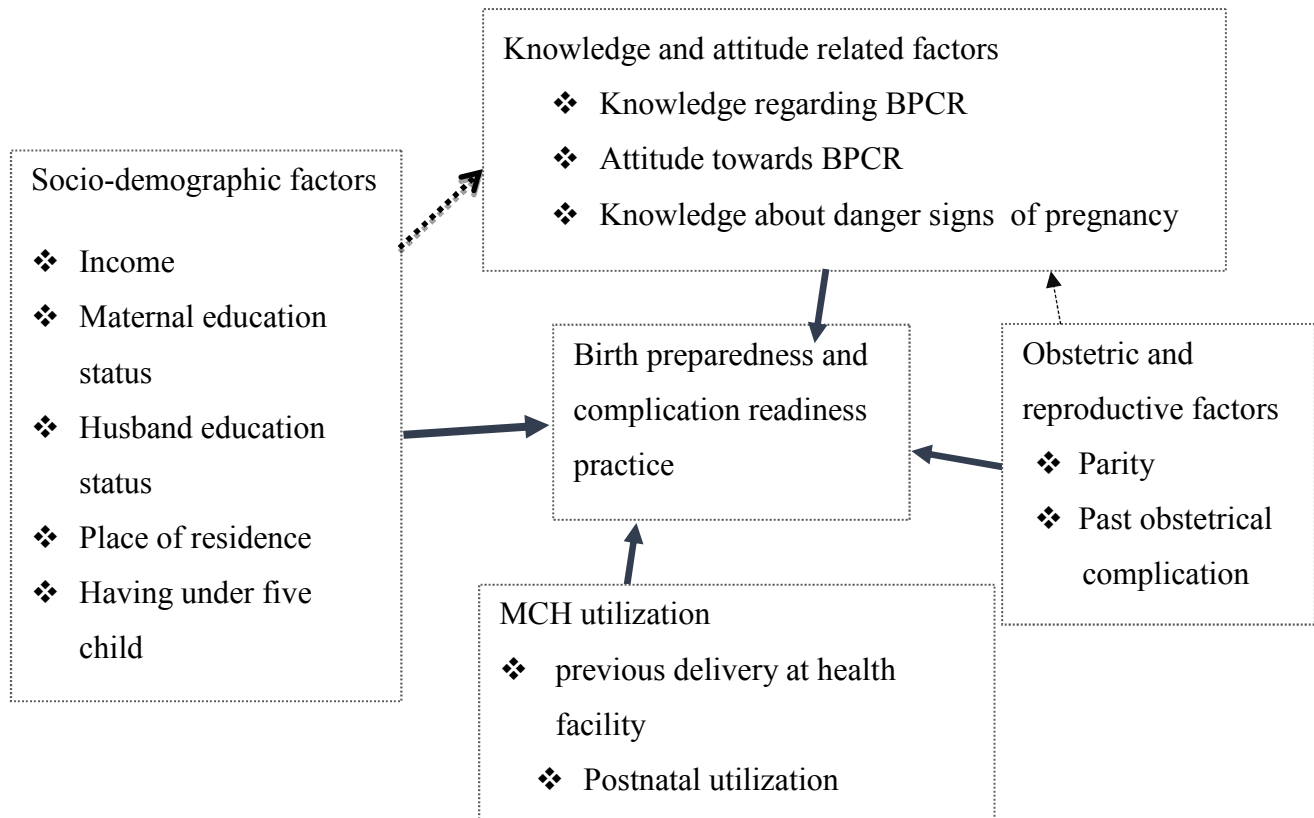


Figure 1: Conceptual framework of the study

CHAPTER THREE

3. OBJECTIVES OF THE STUDY

3.1. General Objectives

1. To assess the magnitude of BPCR and associated factors among pregnant women attending ANC at WUCSH, Ethiopia.

3.2. Specific Objectives

1. To determine magnitude of birth preparedness and complication readiness among pregnant women attending ANC at WUCSH, Ethiopia.
2. To identify factors associated with birth preparedness and complication readiness among pregnant women attending ANC at WUCSH, Ethiopia.

CHAPTER FOUR

4. METHODS AND MATERIALS

4.1. Study Area and Period

The research was conducted at Wollega University Comprehensive Specialized Hospital, one of the major teaching hospitals in the Oromia Region, Ethiopia. The hospital is located in Nekemte town, the capital of the East Wollega Zone, approximately 330 km west of Addis Ababa. It is a referral hospital affiliated with Wollega University and provides health care services to a large catchment population from East Wollega, West Wollega, Horro Guduru Wollega, and parts of the Benishangul-Gumuz Region.

Established in 2009 E.C., the hospital has progressively expanded its capacity and infrastructure to deliver both general and specialized medical services. It is equipped with various departments, including Internal Medicine, Surgery, Pediatrics and Child Health, Obstetrics and Gynecology, Anesthesia and Pain Medicine, and Emergency and Critical Care Medicine. The Obstetrics and Gynecology Department has senior physicians, midwives, residents, and medical interns providing antenatal care, delivery services, postnatal care, and gynecological services.

As a teaching hospital, it serves as a training site for medical students, residents, nurses, and other health science students from Wollega University. The hospital has a steadily increasing patient load, making it an ideal setting for clinical and public health research.

4.2. Study Design

A hospital-based cross-sectional study was conducted among women attending antenatal care services at WUCSH.

4.3. Source population

All pregnant women whose gestational ages were ≥ 28 weeks, having ANC at WUCSH during the study period constituted the source population.

4.4. Study population

All pregnant women whose gestational age were of ≥ 28 weeks, had antenatal care (ANC) at WUCSH and were willing to participate during the data collection period.

4.5. Sample size determination

A single population proportion formula was used to calculate the minimum required sample size. The calculation assumed a 95% confidence interval, a 5% margin of error, and a proportion (p) of 27.5%. This proportion was based on a previous study conducted in the Jardega Jarte district of the Horro Guduru Wollega Zone, which found that 27.5% of women were well-prepared for birth and its complications[35].

So, using the Cochran's formula for single population [47]:

$$n = \frac{Z^2 p(1-p)}{d^2},$$

Where:

n = required sample size

Z = standard normal deviate for the desired confidence level (1.96 for 95%)

p = estimated proportion of the population with the attribute (0.275)

d = margin of error (5%)

$$n = \frac{(1.96)^2 0.275(1-0.275)}{(0.05)^2} = 1.05644 \times \frac{0.725}{0.0025} = \frac{0.765919}{0.0025} = 307$$

Considering 10% non-response rate (r), the final sample size (n_f) was calculated as:

$$n_f = \frac{n}{1-r} = \frac{307}{1-0.1} = \frac{307}{0.9} = 342$$

Thus, a total of 342 participants were selected using a systematic random sampling technique

4.6. Inclusion and Exclusion Criteria

4.6.1. Inclusion Criteria

All pregnant women who had ANC at WUCSH, had a gestational age of ≥ 28 weeks, and were willing to participate were included in the study.

4.6.2. Exclusion Criteria

All pregnant women attending ANC at WUCSH, whose gestational age was ≥ 28 weeks but who were critically ill & mentally disabled, were excluded from the study.

4.7. Study Variables

4.7.1. Dependent variables

Birth preparedness and complication readiness practice

4.7.2. Independent variables

1. Age, address, religion, ethnicity, marital status, occupation, educational status, income, place of residence
2. Gravidity, parity, gestational age, utilization of antenatal care, past obstetric complications, ANC contact,

4.8. Operational Definitions

Birth Preparedness and Complication Readiness (BPCR): This includes five components: - identifying the place of delivery, identifying a skilled birth attendant, having awareness & knowing means to get blood transfusion services, planning transportation in case of emergency, and saving money for emergencies. Women who planned for at least three of these five components were considered “well prepared for birth and its complications, whereas failure to plan for at least 3 components of BPCR were considered not well prepared[1].

Knowledge of Danger Signs/symptoms:

- Pregnancy: Women who spontaneously mentioned at least 3 key danger signs during pregnancy period (Headache, blurred vision, Epigastric pain, gush of fluid per vagina ,vaginal bleeding before labor & delivery, swollen hands/face, absent fetal movement) were considered to have knowledge about pregnancy danger signs(antepartum period)
- Labor& Delivery: Women who spontaneously mentioned at least 3 key danger signs (convulsions during labor, profuse vaginal bleeding during labor, prolonged labor >12 hours, Cessation of pushing down pain,, abnormal fetal presentation during labor, retained placenta) were considered to have knowledge of danger signs during labor & delivery
- Postpartum: Women who spontaneously mentioned at least 3 danger signs (post-partum profuse vaginal bleeding, high fever, foul-smelling vaginal discharge, painful leg swelling, breast pain, swelling & ulceration, new onset of behavioral change) were considered to have knowledge of post-partum danger signs.
- Neonatal danger signs- those who spontaneously mentioned at least 4 of neonatal danger signs(failure to suck, fast breathing, yellowish discoloration of eye/skin, small birth weight, umbilical cord bleeding/discharge) were considered to have knowledge of neonatal danger signs

4.9. Sampling techniques

A systematic random sampling technique was used. In the previous year, about 1,030 pregnant women with gestational age of ≥ 28 weeks attended ANC at WUCSH over a 6-month period (June to November). A similar number was expected for the study period. The sampling interval (K) was calculated as:

$$K = \frac{N}{n} = \frac{1030}{342} \approx 3$$

So, study units were selected ,by initially choosing the first participant randomly from ANC chart registration from 1 to Kth ,then the remaining study units were selected every kth interval (every 3 registered pregnant women) until reaching required total sample size of 342.

4.10. Data collection method and quality assurance

Data were collected using interviewer administered questionnaires through face-to-face interviews. The data collection instruments were adapted from standardized BPCR tools and indicators [1]. A pre-tested and semi-structured questionnaire was used to assess the socio-demographic characteristics of the participants (age, educational level, marital status, religion, occupation, and monthly income) as well as their practices regarding Birth Preparedness and Complication Readiness (BPCR). The tool was developed in English and translated into local languages (Afaan Oromoo) by two independent bilingual translators & then back translated to English to guarantee consistency. Training was provided to data collectors & Supervisor prior to data collection. Pretest was done on 10% of the sample size (35 pregnant women who fulfilled the inclusion criteria) on a portion of population with similar characteristics in similar setting & necessary modifications were made to the questionnaire after the pretest. Data collection was conducted by trained midwives and closely supervised. The supervisor monitored the data collection process to ensure that each completed questionnaire was accurate. To ensure completeness and quality, each filled questionnaire was checked daily by supervisor & also the data were checked at the end of entry for completeness. The reliability of 11 Likert scale attitude items used for measuring attitudes towards BPCR was evaluated with Cronbach alpha coefficient with computed value of 0.8 and each 11 Likert scale attitude items was rated on a five point scale with mean score.

4.11. Data analysis and interpretation

The data were entered into EpiData version 4.7 and analyzed using the Statistical Package for Social Sciences (SPSS) version 27. Binary logistic regression analysis was conducted to identify factors associated with birth preparedness and complication readiness. Candidate variables with a P-value ≤ 0.25 in the bivariable analysis were selected for multivariable logistic regression analysis. Multivariable logistic regression was used to identify factors

significantly associated with birth preparedness and complication readiness after controlling for potential confounders. Adjusted odds ratios (AORs) with 95% confidence intervals (95% CI) were used to determine the strength of the association between the dependent and independent variables. A P-value < 0.05 was considered statistically significant.

Multi collinearity diagnostic test was conducted with VIF with threshold of 10 & there is no collinearity detected among independent variables (maximum VIF was 1.35). Model fitness was checked with Hosmer & Lemeshow fitness model & the model was fitted (p value-0.245)

4.12 Ethical considerations

Ethical clearance was obtained from the Institute of Health Sciences Research Ethics Review Committee, and permission to conduct the study was granted (IHS REC/14/046/2025). Verbal informed consent was obtained from the study participants, and their right to withdraw or refuse participation was respected. Additionally, participants' names were not used in the study, and all information obtained from them was kept confidential.

4.13. Plan for dissemination of the result

The results of this study will be presented to the scientific community of Wollega University and submitted to the School of Medicine, Department of Obstetrics and Gynecology. After approval by the advisors, publication in peer-reviewed national or international journals will be considered accordingly.

CHAPTER FIVE

5. RESULTS

5.1. Socio-demographic characteristics

Of the total 342 pregnant women respondents, 240 (70.18%) were urban residents. Majority, 243 (71%), lied in the age group of 23- 32, while 78 (22.8%) were 33–42 years of age; with a mean ($\pm$ SD) age of 26.02 ± 4.744 years. The minimum age was 18years & the maximum was 43years. Oromo were the predominant ethnic group, 230 (67.25%). The leading religion was protestant, 199 (58.19%). The majority 335 (97.9%) of the respondents were found to be currently married, while the remaining proportion were separated, divorced, widowed, or single. The great majority had private work 126 (36.8%) and 104 (30.41%) housewives. Regarding their educational status, about 232 (67.84%) of mother had formal education. The mean family size was 3.58 ± 1.467 standard deviation (SD) with a range of 1–10 people in a household. About 157 (45.91%) of the participants had under-five children in the house currently.

5.2. Past obstetric history

Gravidity, number of pregnancies ever had, ranged from 1 to 8 among the respondents with a mean ($\pm$ SD) of 2.77 ± 1.9 . Similarly, number of live births ever had ranged from 0-7 with a mean ($\pm$ SD) of 1.6 ± 1.431 . About 73 (21.3%) of the respondents were prim gravida, while (12.8%) of them had had five or more pregnancies. Among the respondents, more than half (65.5%) were found to have 2–4 children. Among those who ever had pregnancies prior, 40 (11.69%) and 8 (2.34%) had history of abortion and stillbirth, respectively. The majority of women, 337 (98.54%) had at least one ANC contact; 51.75% already had four ANC contacts and 3.2% had eight times. Among those who attended ANC, more than three quarters (67.4%) attended four or more contacts already, while five (1.46%) women had come for first time. With regard to medical decision-making; the majority of 243 (63.3%) of respondents indicated that their medical decisions were taken by themselves and their husbands. On the other hand, 24 (6.3%) and 117 (30.5 %) of the respondents revealed that their medical decisions are taken by themselves only and their husband, respectively.

Table 1: Socio-demographic characteristics of respondents among Pregnant Women Attending Antenatal Care at WUCSH, Western Ethiopia, 2025

Variables		Frequency	Percentage
Place of residence	Urban	240	70.18
	Rural	102	29.82
Age (Years)	18-22	19	5.56
	23-27	130	38.01
	28-32	113	33.04
	33-37	60	17.54
	38-42	18	5.26
	43- 49	2	0.58
Ethnicity	Oromo	230	67.25
	Amhara	85	24.85
	Tigre	10	2.92
	Gurage	17	4.97
Religion	Protestant	199	58.19
	Orthodox	80	23.39
	Muslim	59	17.25
	Catholic	4	1.17
Marital status	In marital Union	335	97.95
	Not in marital Union	7	2.05
Educational Status	No formal education	110	32.16
	Primary education	120	35.09
	Secondary Education	74	21.64
	College or Higher Education	38	11.11
Occupation	Farmer	86	25.14
	Government Worker	26	7.6
	House wife	104	30.41
	Private work and others	126	36.84
Under five child at home	Yes	157	45.91
	No	185	54.09
Number of person living in the house hold	1-3	182	53.22
	4-6	143	41.81
	7 or more	17	4.97
Decision maker in the house hold	Respondent and husband	216	63.16
	Husband	104	30.41
	Herself	22	6.43
Number of prior ANC before	atleast 1x	337	98.54
	4x	177	51.75

current ANC contact		149	43.57
	8x or more	11	3.22
House hold income (by tertile method)	Low (<5000ETB)	114	33.3%
	Middle(5000-10,000ETB)	114	33.3%
	High(10,000ETB)	114	33.3%

5.3 Birth preparedness, complication readiness and associated factors

5.3.1. Knowledge of key danger signs and attitude towards BPCR

The key obstetric danger signs were assessed by women's spontaneous response to the questions focusing on each period of pregnancy, labor & delivery, and postpartum. Among the respondents, 273 (79.69%), 27 (7.81%), and 71 (20.83%) women spontaneously mentioned vaginal bleeding, swollen hands/face, and blurred vision as danger signs during pregnancy, respectively. However, only 77 (22.5%) spontaneously mentioned at least three of key danger signs during the pregnancy (antepartum period). The qualitative findings substantiated that vaginal bleeding, headache, decreased fetal movement and gush of fluid before labor is the most common danger sign associated with pregnancy. Regarding danger signs during labor & delivery, 273 (79.69%), 3 (0.8%), 36 (10.4%), and 107 (31.25%) of the respondents spontaneously mentioned vaginal bleeding during labor, retained placenta, prolonged labor, and convulsions, respectively, as danger signs associated with labor/delivery. On the other hand, 14 (4.1%) of the respondents spontaneously mentioned at least three of the key danger signs associated with labor/delivery. The qualitative findings substantiated that mal presentation and loss of consciousness during labor is the other common danger sign associated with labor and delivery.

Regarding key danger signs during postpartum period: severe vaginal bleeding, foul smelling vaginal discharge and high fever were spontaneously mentioned by 273 (79.69%), 35 (10.16%), and 59 (17.19%), of respondents respectively. In addition, 67 (19.5%) respondents spontaneously mentioned at least three of the danger signs of postpartum period mentioned earlier. The four key danger signs of neonates: difficult or fast breathing, small birth weight, lethargy/unconscious and seizure/convulsion were spontaneously mentioned by 151 (44.01%), 40 (11.72%), 56 (16.41%) and 55 (16.1%), respectively. While, only 29 (8.47%) were able to spontaneously mention the four key danger sign of neonates. Attitude of the

respondents was measured by using a composite variable of eleven attitude items with a Likert scale and attitude score was done by mean score with a five point scale. Then, mothers, who scored above or equal to the mean score were rated as having favorable attitude. Based on this, 241 (70.57%) were found to have favorable attitude towards BPCR.

Table 2: Awareness of key danger signs and attitude towards BPCR among Pregnant Women Attending Antenatal Care at WUCSH, Western Ethiopia, 2025

Variables		Frequency	Percent
Knowledge of key danger signs during pregnancy (multiple responses)	vaginal bleeding before labor & delivery	273	79.69
	swollen hands/face	27	7.81
	blurred vision	71	20.83
	Headache	126	36.72
	Gush of fluid without labor	65	19.01
	decreased/absent fetal movement	102	29.69
Knowledge of key danger signs during labor and delivery (multiple responses)	loss of consciousness	121	35.49
	convulsions	107	31.25
	prolonged labor	36	10.42
	retained placenta	3	0.78
	severe vaginal bleeding during labor & delivery	273	79.69
	abnormal fetal presentation during labor	74	21.61
Knowledge of key danger signs during postpartum period (multiple responses)	foul smelling vaginal discharge	35	10.16
	high fever	59	17.19
	Postpartum profuse vaginal bleeding	273	79.69
Knowledge of key danger signs during neonatal period (multiple responses)	difficult or fast breathing	151	44.01
	lethargy/unconscious	56	16.41
	small birth weight	40	11.72
	seizure/convulsion	55	16.15
	yellow skin or eye color (jaundice)	85	24.74
	poor sucking or feeding	216	63.28
	Fever	77	22.66
Attitude towards birth preparedness and complication readiness	favorable attitude (above or equal to mean score)	241	70.57
	unfavorable attitude (less than mean score)	101	29.43

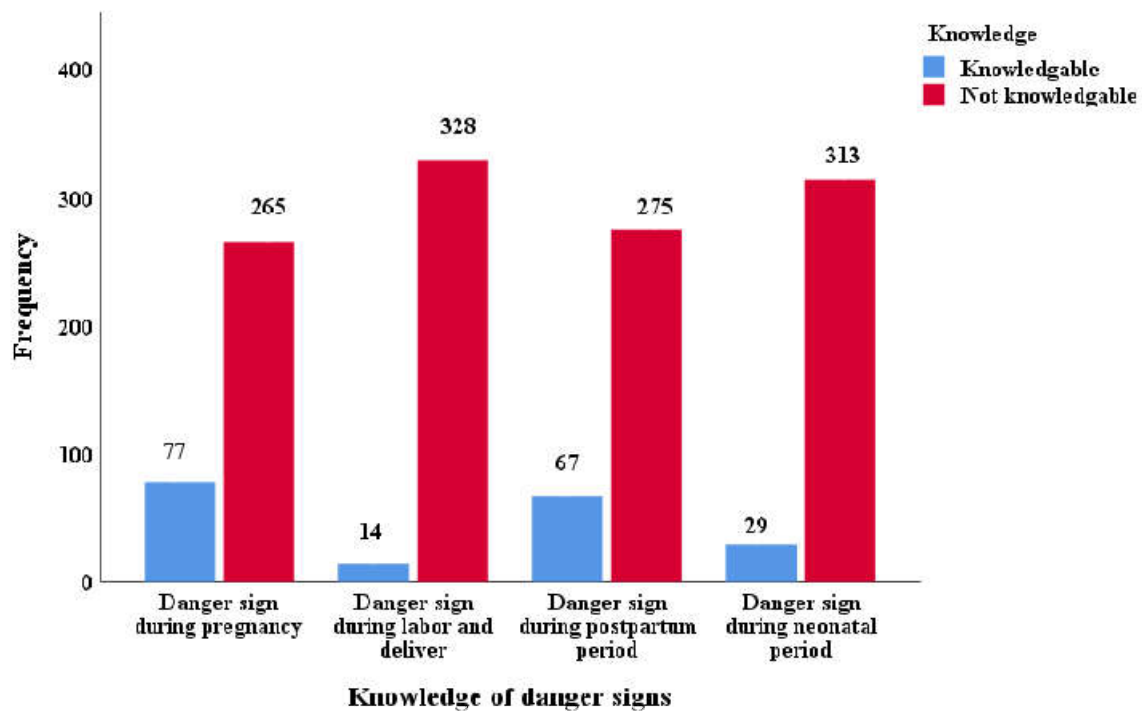


Figure 2: Knowledge of danger signs

5.3.2 Birth preparedness and complication readiness practice

According to the study, 259 (75.7) of women described that they have heard the term “birth preparedness” before from health providers during ANC contact. Among the five elements of BPCR, 297 (86.7%) planned to save money, 185 (54.2%) planned to arrange transport, 121(35.3%) have awareness &knew means to get blood transfusion services, 215 (63%) plan to give birth at health facility and 91 (26.6%) plan to be attended by skilled birth attendant for their pregnancy. By considering three or more components of BPCR of the five components, 181 (52.9%) were found to fulfill the criteria and rated as well prepared for BPCR.

Table 3:BPCR practice among women attending ANC at WUCSH among Pregnant Women Attending Antenatal Care at WUCSH, Western Ethiopia, 2025

Variables		Frequency	Percentage
Components of BPCR practice	Planned to save money	297	86.7
	Planned to arrange transport	185	54.2
	Planned to give birth at health facility	215	63
	Have awareness & knew means to access blood transfusion services	121	35.3
	Planned to be attended by skilled attendant	91	26.6
Number of components planned for	< 3 (not well prepared)	161	47.1
	≥ 3 (well prepared)	181	52.9

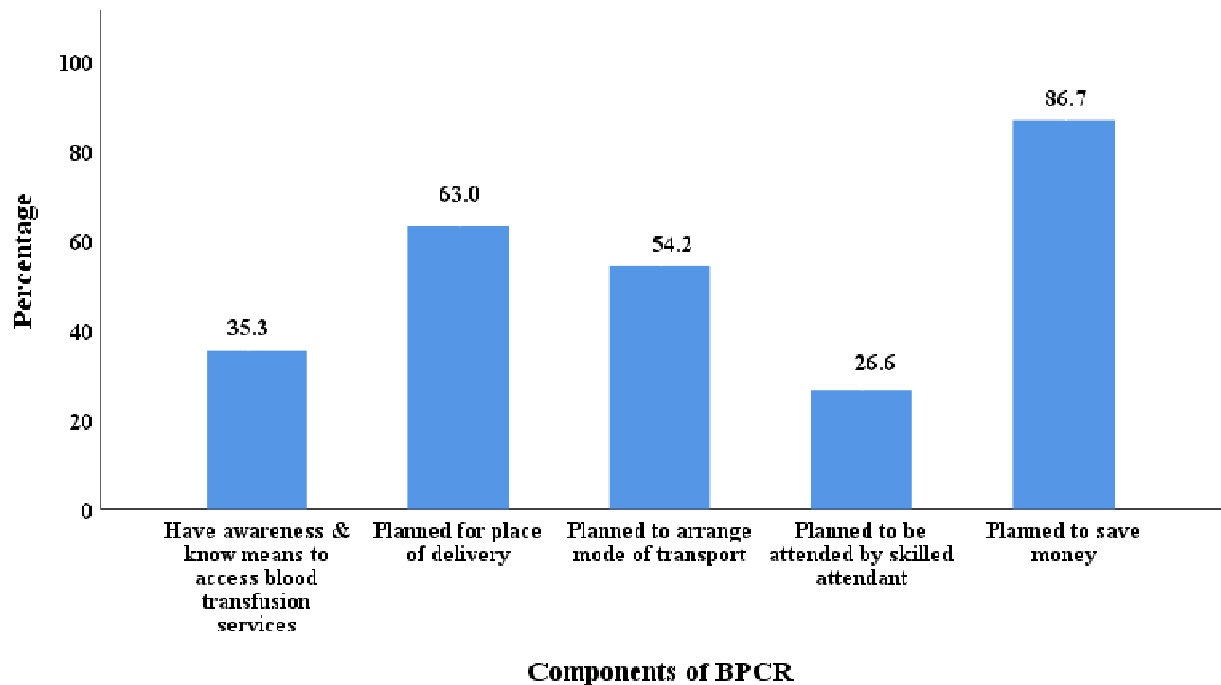


Figure 3: Components of BPCR among Pregnant Women Attending Antenatal Care at WUCSH, Western Ethiopia, 2025

5.3.3. Factors affecting birth preparedness and complication readiness

According to the bivariate logistic regression analysis, the following study variables were significantly associated with BPCR practice ($p < 0.05$): urban dwellers, mother and husband having formal education, being government employee, high household income, small family size, history of obstetrics complications like abortion & SB on the last pregnancy, presence of under-five child at home, having heard about BPCR prior and knowledge about danger signs of pregnancy, postpartum period and neonate. In addition, those variables with p value < 0.25 from the bivariate analysis were shifted and analyzed by multivariate analysis. Accordingly, those mothers who were urban dwellers, governmental employee, high household income, small family size, who had a knowledge about danger signs of pregnancy, who previously heard about BPCR, pregnant women and her partners who had formal education, and those who don't have under five years child at home were more prepared for BPCR.

The odds of birth preparedness and complication readiness among mothers who had knowledge about danger signs of pregnancy were significantly higher (approximately 3.5 times) compared to their counterparts [AOR = 3.50, 95% CI: 2.34 – 5.23]. Likewise, pregnant women and her partner who had formal education were nearly six times [AOR = 6.10, 95% CI: 4.56 – 8.12] and 4.5 times [AOR = 4.50, 95% CI: 3.12 – 6.45] more likely to be prepared for BPCR as compared to those who had no formal education, respectively. The odds of birth preparedness and complication readiness of pregnant women who had no under-five child at home were 4.20 times higher [AOR = 4.20, 95% CI: 2.89 – 6.12] than those who had under five child at home. Pregnant women who had heard about BPCR were 2.64 times more likely to be prepared for birth and complication readiness compared to those who had not heard about BPCR [AOR = 2.64, 95% CI: 1.78 – 3.89]. Also, those pregnant women having relatively smaller family size per household & those who are government employee were more likely well prepared for BPCR with [AOR = 2.50; CI 1.56 – 4.01] & [AOR = 3.80; CI: 2.34 – 5.12] respectively. Household income was categorized into tertiles (low, middle & high) using rank based classification where respondents were divided into three equal groups, ($n/3$) based on household income distribution. Accordingly, Pregnant women who were in a relatively high household

income group were 3.2 times [AOR=3.2, 95% CI: 2.34 – 4.56]likely to prepare for BPCR than low income groups, whereas those in middle income group were 1.8 times [AOR=1.8, 95% CI: 1.34 – 2.34]prepared than lower house income group.

Table 4: Multivariate analysis on BPCR among Pregnant Women Attending Antenatal Care at WUCSH, Western Ethiopia, 2025

Variables	Categories	Not prepared	Prepared	COR (95% CI)	AOR (95% CI)	p-value
Residence	Rural(ref)	82	20	1	1	0.001
	Urban	79	161	8.00 (6.34 – 9.89)	6.72 (4.89 – 8.23)	
Mother education	No formal(ref)	17	111	1	1	0.001
	Formal	50	164	8.50 (6.89 – 10.45)	6.10 (4.56 – 8.12)	
Husband education	No formal(ref)	67	15	1	1	0.02
	Formal	94	166	6.50 (5.12 – 8.23)	4.50 (3.12 – 6.45)	
Under 5 child	Yes(ref)	105	52	1	1	0.03
	No	37	148	6.00 (4.89 – 7.45)	4.20 (2.89 – 6.12)	
	≥7(ref)	11	15	1	1	
Family size	1-3	90	92	3.00 (2.12 – 4.23)	2.50 (1.56 – 4.01)	<0.001
	4-6	60	74	3.20 (2.34 – 4.45)	3.00 (1.89 – 4.76)	
Knowledge of danger signs	Not knowledgeable(ref)	113	105	1	1	0.02
	Knowledgeable	48	76	4.50 (3.45 – 5.89)	3.50 (2.34 – 5.23)	
Occupation	Farmer(ref)	55	31	1	1	<0.001
	Government employee	6	20	4.50 (2.89 – 6.45)	3.80 (2.34 – 5.12)	
	Housewife	44	60	3.20 (2.12 – 4.56)	2.50 (1.67 – 3.78)	
	Non-governmental & other	60	66	2.98 (2.01 – 4.23)	2.20 (1.45 – 3.34)	
Heard about BPCR prior	No(ref)	64	29	1	1	0.04
	Yes	97	162	4.00 (3.12 – 5.12)	2.64 (1.78 – 3.89)	
Income level	Low(ref)	84	30	1	1	0.03
	Middle	59	55	2.50 (1.89 – 3.34)	1.80 (1.34 – 2.34)	
	High	34	80	4.50 (3.56 – 5.78)	3.20 (2.34 – 4.56)	

CHAPTER SIX

6. DISCUSSION

This study was conducted to assess magnitude of birth preparedness, complication readiness and associated factors among mothers attending ANC in WUCSH. Birth preparedness and complication readiness are proven and effective health care strategies for reducing maternal and child mortality, particularly in countries with a high risk of maternal death and an inadequate health-care system. Thus, the lack of BPCR full package implementation necessitates performing this like studies. Accordingly, the overall prevalence of BPCR practice plan in the study area was 52.9%. The finding aligns with those study conducted in Addis Ababa, Dire Dawa, Wolayta Sodo town & Yirgalem General hospital , with BPCR practice of 56.3%, 54.7%, and 48.5%&48.6% , respectively[36][37][48][51]. Whereas it is higher compared to a study conducted in Jimma Zone, south west Ethiopia 23.3% [32], Mizan Aman town, southern Ethiopia 22.2% [14], Adigrat town, North Ethiopia 22.1% [24], Gondar 34% [33], Sidama, southern Ethiopia 17.0% [17], Wolayita Zone, Duguna Fango district 18.3%, [49], Jarte, Horro Guduru Wollega27.5% [35] Goba, East Ethiopia 29.9% [13] and India 47.8% [27]. The discrepancy might be due difference in study settings, application of exclusion criteria and the current quality of health care & availability of information about BPCR by this time of study. In contrast, the level of BPCR in this current study is lower compared to a study conducted in Nigeria 87.4% [30] , and Tanzania 82.3% [31] . The difference could be due to likely difference in socio-demographic variation, sample sizes and variations in the way the health care system is implemented.

According to this study, 86.7% pregnant women planned to save money, 63% planned to identify place of birth, 26.6%planned to identify skilled birth attendant, 54.2% planned to arrange transportation, and 35.3% have awareness & knew means to get access to blood transfusion services which is relatively high compared to study done in Jimma Zone, Southwest Ethiopia 32.4% of mothers identify place of birth, 21.9% identifying skilled birth attendants, 73.5% save money, 60.2% arranged transport and 19.9% identified potential blood donors [32]. In contrast, the level of the five components of BPCR was relatively low in this study compared to study conducted in Sodo town 69.9% planned for place of birth, skilled birth attendants are identified 42.6% of the time, transportation is arranged 38.4% of

the time, potential blood donor was identified 1.6% of the time, and money is saved 86.9% of the time [48] and a study done in Bangkok, Thailand 92.5% planned to give birth by skilled birth attendant, 42.5% planned to save money and 91% planned to arrange transport [50]. This might be due to by difference in socio demographic characteristics, methodologies & the difference in study settings.

Being an urban resident was significantly associated with birth preparedness and complication readiness. Women who lived in urban areas were 6.72 times more likely to be prepared for childbirth and its complication than women living in rural dwellers. This finding is in line with the studies in Jarte [35], Goba district, and Sub-Saharan Africa; but contradicting to study conducted in Southern Nigeria where no difference in residence was observed. Those women who were government employee were more likely prepared as compared to farmer. The reasons may be, being urban dweller and being employed are related to access to information, better knowledge and income, which enable them to prepared for birth and its complications.

Formal education of the mother and her husband was significantly associated with birth preparedness and complication readiness (BPCR) practice.

The respondent and her partner who had a formal education of were nearly 6 times and 4.5 times more likely to be well prepared for BPCR as compared to those who had no formal education, respectively. These findings indicate that higher educational attainment of both the mother and her partner greatly increases the likelihood of being prepared for childbirth and potential complications.

The finding of this study was in line with the study done in Jimma zone, Wolayta zone, Sodo town, Southern Ethiopia and Robe Woreda, Arsi zone, Central Ethiopia. The reason may be education gives a greater health care seeking behaviors, build confidence and decision making ability that enhance their birth preparedness and complication readiness.

Per this study, 45.91% of the participants had children under five years of age at home. Mothers who did not have children under five at home were 4.2 times more likely to be prepared for birth and its potential complications compared to mothers who had children

under five. This finding is consistent with a study conducted in Jarte [35]. The low likelihood of birth preparedness among mothers with young children may be due to the additional responsibilities of caring for under-five children, which could limit their ability to focus on themselves. This signifies the importance of integrating family planning services and support for maternal health to ensure that mothers can adequately prepare for childbirth and its potential complications. The odds of birth preparedness and complication readiness among Women who had knowledge about danger signs during pregnancy were significantly higher (approximately 3.5 times) compared to their counterparts. Furthermore, knowledge of key danger signs during pregnancy was also significantly associated with birth preparedness and complication readiness. Also, women who had heard about birth preparedness before were more likely to be prepared for birth and its complications compared to those who had not heard it. This finding underscores the importance of awareness and prior information in enhancing birth preparedness and complication readiness practice. This is consistent with other studies conducted both in Ethiopia and internationally, which found that knowledge of danger signs is a strong predictor of BPCR practice, Arsi, Robe woreda [15], Farta district [33], Abeshige district, Gurage Zone [43], Ghana [44], Tanzania [31]. This could be due to the fact that recognizing the danger signs in pregnancy would lead women to seek solutions from medical staff and be willing to take some better action. Knowing the pregnancy danger signs is a key step in recognition of the complication. This, in turn, leads to the awareness of the need for medical care, the decision to seek treatment and to behave where it needs to obtain emergency care from a skilled provider. This suggests importance of having prior knowledge of pregnancy danger signs for better BPCR practice. Additionally, according to the findings of this study pregnant women in the relatively high & middle house hold income group were 3.2 times & 1.8 times likely to be well prepared for BPCR than those in relatively in low household income group. This is consistent with studies conducted in similar low resource settings-where economic capacity plays a key role in reducing delays in seeking & reaching care. The positive correlation between higher household income & BPCR may be explained by improved financial access to health services, transportation & emergency funds.

CHAPTER SEVEN

7. STRENGTH AND LIMITATION OF THE STUDY

7.1. Strength of the Study

The study was conducted in comprehensive specialized hospital serving large diverse pregnant women on a relatively large sample size (342, pregnant women) which enhances the representativeness of the findings for pregnant women attending ANC in similar settings. Standardized, expert reviewed, data collection tool(BPCR questionnaire, adapted from JHPIEGO,2004), was used after pretested & modified to fit local context ensuring data reliability, consistency& comparability. Furthermore appropriate statistical method were employed(Bivariate logistic regression, Multivariate logistic regression. Multi collinearity test, model fitness test)which enables identifications of independent variables associated with BPCR while controlling for potential confounders.Additionally, data quality was maintained through proper training of data collectors, supervisors, and close supervision during data collection &daily checking completed questionnaires with check of data after entry for completeness & consistency. More over the study addressed important public health issue in maternal health, providing locally relevant evidence that can support interventions improving BPCR practices in the study area.

7.2. Limitation of the Study

Since cross sectional study design was used, it was difficult to study temporal relationships between independent and dependent variables made subjected to recall &social desirability bias limiting the reliability.

Since it was a health facility based study ,it did not included those pregnant women who had no ANC, so the findings may not generalized to wider pregnant women outside the facility

CHAPTER EIGHT

8. CONCLUSION AND RECOMMENDATIONS

8.1. Conclusion

According to WHO maternal & newborn care all pregnant women are expected to have a written BPCR plan. Based on this standard, this study revealed moderate level of plan to practice BPCR in the study area, only near half (52.9%) were prepared for child birth & its potential complications. pregnant women not well prepared for BPCR could mean, they will not going to be delivered by skilled birth attendant contributing for maternal, neonatal morbidity & mortality. Moreover, having knowledge of pregnancy danger signs, being urban dwellers, not having under five child at home, having formal education, having relatively small family size, being government employee, being heard about BPCR prior & having high household income were significantly associate with BPCR practice.

8.2. Recommendations

Promoting BPCR practices by Intensive health education program and paying particular attention to mothers from rural areas, house wives, no formal education & no knowledge of pregnancy danger signs during the ANC contact at the facility level is recommended. On the other hand, availing health service to rural areas will be important interventions to prevent pregnancy-related complications. Improving ANC, giving special emphasis to knowledge of key danger signs and BPCR during health education and ANC counseling are recommended as a short term solutions. Giving a written BPCR plan with in depth counseling and rehearsing it with skilled personnel during ANC contacts or at least a month prior to delivery is recommended. Some nations, including Nepal, have instituted birth preparedness cards, also called as 'key chains,' with messages on BPCR [20]. Additionally, Health facilities, can use TV and mobile technology (SMS notifications) to repeat BPCR messages. In addition doing home visits and community meetings, Community Health Workers in Rwanda also use mobile technology to repeat BPCR messages via SMS notifications [21] women education are recommended as long term interventions.

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ANNEXES

Annex I: Participant Information Sheet [English Version]

Introduction/Purpose: My name is Dr. Dugasa Erko and I am a 4th year OB/GYN resident at Wollega University. Currently, I am conducting research titled, magnitude of BPCR among pregnant mothers having ANC at WUCSH, western Ethiopia. The information you will give is very important for successful completion of this study and for health policy makers as well.

Procedures: The procedure followed in this study will include a brief questionnaire that will seek to gather socio-demographic and general clinical condition related information from attendant physician, and pregnant women.

Risk: There will be no risk and serious invasive procedure at the beginning as well as at the end of the research.

Benefits: The participant will not be paid for participating in this study.

Confidentiality: The data of respondent will be kept confidential and could only be accessed by the researcher and the data collectors. There will be no personal information to be attached to your data.

Voluntary participation and withdrawal: Taking part in this research is voluntary. I will respect your decision if you later on change your mind and you can refuse to participate or withdraw from the interview at any time. Refusal to participate will not result in loss of medical care provided or any other benefits. You can get your results of the analysis.

Contact person: I will be pleased to respond to your inquires and provide more details if necessary to help you understand the study. So please let me know if anything regarding the study is not clear. You can contact or give me a call with any questions you may have about this study.

Principal Investigator: Dr. Dugasa Erko

Mobile Number: +251911254104, e-mail **dhugaaofiii25@gmail.com**

Annex II: Consent form [English version]

QUESTIONNAIRE

VERBAL CONSENT

Good morning/afternoon/evening. My name is _____. I am speaking with pregnant women about the experience of being pregnant and of having children. I will like to ask you a few questions if I may, but you can refuse to answer any question I ask. You may end the interview at any time. You can also refuse to involve in the interview entirely. The interview will last approximately 15 minutes. The information I collect from you will not be shown to anyone outside of this research. May I proceed with the questions? Yes/No _____ Date _____

SECTION 1. SOCIODEMOGRAPHIC AND GENERAL INFORMATION

1. Age _____
2. Residency, Urban or Rural? _____
3. Reproductive History _____
4. Ethnicity _____ 5. Religion _____
6. What is your marital status now? A. single B. married C. widowed D. divorced
E. Separated
7. Are you currently living with your partner? A. yes _____ B. No _____
8. Have you ever attended school (Educational Status) A. primary education?
B. secondary education C. Higher education D. No formal education
9. Your Occupation A. Private work B. Government employee
C. House wife D. Farmer E. Others (specify) _____
10. Average house hold monthly income in ETB _____ (average best estimate if you don't know exact amount)
11. Did your partner attend Formal education? A. Primary education B. Secondary education
C. Higher education D. No formal education

SECTION 2. KNOWLEDGE

Now I will like to ask you some questions about pregnancy and childbirth. Specifically, I am going to ask you questions about three different phases that pregnant women go through when having a child. These phases are the period of being pregnant, the period of labor and birth, and the period immediately after the birth of the child

2.1. Knowledge of Obstetrics Danger Signs

1. What are some serious health problems that can occur during pregnancy or during labor and childbirth or during the first few days after birth that could endanger the life of a pregnant woman? You will categorize your responses to the above 3 phases; you can mention one danger sign for all 3 phases if you know it can occur during that phases.

- A. Vaginal bleeding B. severe headache C. Blurring of vision D. convulsion
E. Swollen hands/face F. high grade fever G. loss of consciousness
H. difficulty breathing/chest pain I. severe abdominal pain
J. reduced fetal movement K. Passage of liquor without labor
L. labor lasting >12 hours M. Retained placenta
N. foul smelling vaginal discharge O. epigastric pain P. other _____ (specify)
Q. I don't know

2. Do you think , a woman can die from any of these problems?

- A. Yes _____ B. No _____ C. Don't Know _____

3. Now, I will like to ask you a few questions about the health of newborn neonates. What are some major health issues that could jeopardize a newborns life during the first 7 days following birth?

- A, fast/difficult breathing B, yellow skin/eye(jaundice) C, Failure to suck
D, bleeding, pus, or discharge from the umbilical cord E, small birth weight
F, skin lesions like blisters G, convulsions /spasms / rigidity H, lethargy / unconsciousness
I, red or swollen eyes with pus J, other (specify) _____ K.I don't know _____

4. Do you think, a newborn can die from any of these problems?

- A, Yes _____ B. No _____ C, don't know _____

2.2. Practice of Birth preparedness and complication readiness

1. Have you ever heard the term “birth preparedness”? A.yes_____ B.No _____
2. What steps may a woman take, in your opinion, to get ready to give birth?
 - A. arranging transport
 - B. saving money
 - C. having awareness & knowing means to get access to blood transfusion services
 - D. identifying skilled birth attendant
 - E. other (specify) _____

SECTION 3. Attitudes and perceptions about birth preparedness and complication readiness

A. Now I am going to read out a list of common attitudes about pregnancy, childbirth, and the period immediately after childbirth. I would like to know whether you strongly agree, agree, neutral, disagree, or strongly disagree with these statements. There is no right or wrong answer to any of these questions. I am only interested in hearing your opinion.

1. A woman should plan ahead of time **where she will give birth** to her neonate.
 - A. strongly agree
 - B. Agree
 - C. Neutral
 - D. Disagree
 - D. Strongly Disagree
2. A woman should plan ahead of time **how she will get to the place** where she will give birth.
 - A. strongly agree
 - B. Agree
 - C. Neutral
 - D. Disagree
 - D. Strongly Disagree
3. It is not necessary for a **husband/partner to accompany his wife** to antenatal care visits.
 - A. strongly agree
 - B. Agree
 - C. Neutral
 - D. Disagree
 - D. Strongly Disagree
4. When women **do not go to** a health facility to give birth, it is mainly because it **is too expensive**.
 - A. strongly agree
 - B. Agree
 - C. Neutral
 - D. Disagree
 - D. Strongly Disagree
5. When women do not go to a health facility to give birth, it is mainly because it is too difficult to get there.
 - A. strongly agree
 - B. Agree
 - C. Neutral
 - D. Disagree
 - D. Strongly Disagree

6. When women do not go to a health facility to give birth, it is mainly because the **staff there do not treat women respectfully.**

A. strongly agree B. Agree C. Neutral D. Disagree D. Strongly Disagree

7. It is **not** necessary for a husband/partner to **accompany his wife when she is giving birth.**

A. strongly agree B. Agree C. Neutral D. Disagree D. Strongly Disagree

8. Having regular ANC can help pregnant women for safe delivery

A. strongly agree B. Agree C. Neutral D. Disagree D. Strongly Disagree

9. Giving birth is mostly a woman's matter. partners have little to contribute

A. strongly agree B. Agree C. Neutral D. Disagree D. Strongly Disagree

10. Saving money is important for emergencies for pregnant women during pregnancy

A. strongly agree B. Agree C. Neutral D. Disagree D. Strongly Disagree

11. Delivering at health facility is safer than delivering at home

A. strongly agree B. Agree C. Neutral D. Disagree D. Strongly disagree

B. Now I am going to read out a list of **common perceptions about doctors, nurses, and midwives.** I would like to know whether you agree, disagree or if you don't know whether you agree or disagree with these statements.

1. **Health professionals know what kind of care a woman needs** during pregnancy, childbirth, and immediately after childbirth

A. strongly agree B. Agree C. Disagree D. Strongly Disagree E. I. Don't Know

2. **Health professionals treat women with respect**

A. strongly agree B. Agree C. Disagree D. Strongly Disagree E. I Don't Know

3. Health professionals know what to do in case of complications

A. strongly agree B. Agree C. Disagree D. Strongly Disagree E. I don't Know

SECTION 4 PERSONAL EXPERIENCES RELATED TO PREGNANCY

In the next three sets of questions, I am going to ask you about your experiences related to the three phases women go through when having a child that we discussed earlier: pregnancy, birth, and the period after birth. I would like to begin by your last pregnancy that resulted in a neonate (born alive or born dead).

1. Had you a stillbirth in your last pregnancy? A. Yes B.no
2. How many times in total did you receive antenatal care during your last pregnancy? I don't remember.....
3. How many weeks/months pregnant were you when you first received antenatal care for last pregnancy? Weeks/Months..... Don't know/don't remember.....
4. Who made the **final decision about whether or not to seek assistance** if problem arise during your pregnancy?
1 Me only 2 me& my husband 3.My husband only 4.other _____ (specify)

Gaaffiiwwan Qophiiwwan Da'umsaa fi Rakkoo isaan wal qabatan (Kutaa Afaan Oromoo)

Eyyama

Akkam jirtu? Maqaan koo _____ jedhama. Ani haadholii ulfaa fi warra daa'an waliin haasawuufan dhufe. Gaaffilee muraasaan isinif dhiyeessa; garuu gaaffii kamiyyuu deebisuu dhiisuu ni dandeessu. Yeroo kamiyyuu marii addaan kutuu dandeessu. Odeeffannoon isin laattan nama birootti hin agarsiifamu.odeeffannoon isin laatan iccitiindhaan eegama. Waantotni eenyummaa kee addaan baasu danda'u kamiyyuu(personal identifiers) asirratti hin galmaa'u. odeeffannoo kana kennuu keen wal qabatee miidhaan addaa sirra ga'uu fi kaffaltiin argattu hin jiru. Gaaffiiwwan kana waliin itti fufuu dandenyaa? Eeyyee/Lakki _____Guyyaa _____

Kutaa 1ffaa: Odeeffannoo Hawaasummaa fi Waliigalaa

1. Umrii : _____
2. Bakka jireenya: Magaalaa moo Baadiyyaa; _____
3. Seenaa da'umsa duranii: _____ 4. Qomoo: _____
4. Amantaa: _____
5. Haala gaa'ilaa : A. Hin heerumne B. Heerumera C. narraa Du'e D. seeraan wal hiikne E. addaan baane
6. Amma abbaa warraa kee waliin jiraattaa? A. Eeyyee ___ B. Lakk___i
7. Barnoota baratteettaa? A. Barnoota sad.1ffaa baradheera B. Sad.2ffaa baradheera C. Barnoota olaanaa baradheera D.Barnoota idilee hin baranne
8. Hojiin kee maali?: A. Hojii dhuunfaa B. Hojjettuu Mootummaa C. Haadha Maatii D. Qonnaan bultuu E. Kan biraa: _____
9. Galii ji'aa kan maatii gidugaleessan,Qarshii meeqa taa;a?: _____(yoo sirritti hamma isaa hin beekne,itti yaaditii , tilmaama gaarii maatii keessan ibsu deebisi)
10. Abbaa manaa kee barnoota baratee? A. Sad.1ffaa barateera B.Sad.2ffaa barateera C. Barumsa Olaanaa barateera D.barnoota idililee hin baranne.

Kutaa 2ffaa: Beekumsa waa'ee ulfaan wal qabatu

2.1 Mallattoo sodaachisoo yeroo ulfaa

1. Rakkoo fayyaa yeroo ulfaa, da'umsaa fi yeroo muraasa da'umsa booda jiran keessatti mudachuu danda'an maalfaa beekta? rakkoowwan kun yeroo sadan armaan olitti ibsaman keessaa kam irratti akka mudachuu danda'an addaan baasaa deebisaa. rakkoo tokko yoo beektan yeroo ulfaa lama ykn sadanuuf dhufu akka danda'u deebisuu dandeessu. :

A. yeroo ulfaa Dhiiguu B. Dhukkubbii mataa cimaa C. Ija fuundura dukkanessuu

D. Gaggabdoo yeroo ulfaa dhufu E. Harka fi fuula dhiitessuu

F. Gubaa qaamaa olaanaa G. Hafuura baay'ee nama kutuu fi war'ansa qomaa

H. of nama wallaalchisuu I. Dhukkubbii garaa cimaa J. Sochiin daa'ima hir'achuu

K. Yeroo malee bishaangubbee dhangala'uu

L. Ciniinsun sa'atii 12 fi isaa ol namarra turuu

M. obbaatiin ba'uu diduu

N. Dhangala'aaan foolii badaa qabu qaama hormaataa keessaa ba'uu

O. Kan biroo (ibsi): _____ P. Hinbeeku _____

2. Rakkoon armaan olii kun haadha ulfaa ajjeesuu danda'a jettee yaaddaa?

A. Eeyyee ____ B. Lakki _____ C. Hinbeeku _____

3. Rakkoon fayyaa sodaachisaan daa'imman kichuu reef dhalatan torban jalqabaa keessatti mudachuu danda'u, maalfaadha jettee yaaadda ?

A. Hafuura kutaa B. Ijni diimachuu fi ciimma'uu

C. Harma qabachuu fi hoodhuu dadhabuu

D. Hiddi handhuuraa dhiiguu, malaa baasuu

E. ulfaatinni qaamaa daa'ima kan dhalootaa xinnaachuu

F. Gogaa fi ijni daa'ima keelloo ta'uu G. Gogaa irratti waa biqiluu

H. of wallaaluu I. Gaggabdoo daa'immanii J. Kan biroo _____ (ibsi) K. Hin beeku _____

4. Rakkoon kun daa'ima ajjeesuu danda'a jettee yaaddaa?

A. Eeyyee ____ B. Lakki _____ C. Hinbeeku _____

2.2 Qophiwwan ulfaa fi da:umsaaf godhaman hojitti hiikuu irratti

1. Qophii Ulfaa fi da'umsaaf godhamu jecha jedhu dhageessee beektaa?

A. Eeyyee _____ B. Lakki _____

2. Haati ulfaa yeruoo ulfa fi da:umsaaa maal faa qopheefachuu qabu jetttee yaadda ?

A. geejjiba B. Maallaqa kuufachuu

C. akkkata itti dhiiga argattu addaan baafachuu fi barbaachisummaa dhiigaa beekuu

D. Ogeessa ishee deesisuu addaan baafachuu E. bakka itti deessu adda baafachuu

F. Ka biroo: _____ (ibsi) G. Hin beeku _____

Kutaa 3ffaa: Ilaalchaa fi dhugeeffannoo qophii ulfaa fi da'umsaaf godhamu irratti

A.Ilaalcha asiratti deebiin sirriidha jedhamu hin jiru.Kaayyoon koo yaada kee qofa dhaggeffachuudha.

1. Haati ulfaa tokko bakka itti deessu dursitee beekuu qabdi.

A. Cimseen amana B. Nan amana C. hin amanu

D. cimsee hin amanu E. waanan jedhu hin qabu

2. Haati ulfaa tokko geejjiba ittiin bakka deessu dhaqxu dursitee addaan baafattee beekuu qabdi. A. Cimseen amana B. Nan amana C. hin amanu

D. Cimsee hin amanu E. waanan jedhu hin qabu

3. Abbaa manaa, yeroo haati ulfaa, qorannoo da'umsa duraaf deemtu faana deemuun sirrii miti. A. cimseen amana B. Nan amana C. hin amanu

D. cimsee hin amanu E. waanan jedhu hin qabu

4. Dubartoonnii ulfaa gara buufata fayyaa kan hin deemneef sababni guddaan kaffaltiin baay'achuu isaati. A. cimseen amana B. Nan amana C. hin amanu

D. cimsee hin amanu E. waanan jedhu hin qabu

5. Haati ulfaa gara buufata fayyaa kan hin deemneef sababni guddaan fagoo ta'uu isaatfi.

A. cimseen amana B. Nan amana C. hin amanu

D. cimsee hin amanu E. waanan jedhu hin qabu

6. Haati ulfaa gara buufata fayyaa hin deemneef sababni guddaan hojjettoonni fayyaa isaanif kabaja waan hin qabneefi.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu

E. waanan jedhu hin qabu

7.Yeroo Haati ulfaa itti deesuu, dhiirri waliin deemu hin qabu

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu

E. waanan jedhu hin qabu

8.Da’umsi hojii Haadha ulfaa qofaadha; dhiirri hagas mara hirmaanna hin qabu.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu

E. waanan jedhu hin qabu

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu E. Hinbeeku

9.Haati ulfaa rakkoo yeroo ulfaa mudatu irra aanuuf maallaqa qusachuun ishee barbaachisa.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu

E. waanan jedhu hin qabu

10.hordoffii da’umsa duraa seeraan hordofuun ,da;umsa nagaa da;uuf nama gargaara.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu

E. waanan jedhu hin qabu

11.Mana yaalaatti da;uun, manatti da’urra balaa xiqqaa qaba.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu

E. waanan jedhu hin qabu

B.Dhugeeffannoo ;asiratti deebiin sirriidha jedhamu hin jiru. Dhugeeffannoo ati hima kanaa gadirratti qabdu qofan beekuu barbaada.nan amana,hin amanu akkasumas hin beekus jechuu dandeessu.

1. Hojjettoonni fayyaa yeroo ulfaa, da'umsaa fi da'umsaan booda deessuu akkamitti haadha ulfaa tajaajiluu akka qaban ni beeku

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu E. Hinbeeku

2. Hojjettoonni fayyaa haadholii ulfaa kabajaan yaalu.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu E. Hinbeeku

3. Yeroo rakkoon mudatu hojjettoonni fayyaa maal akka gochuu qaban ni beeku.

A.cimseen amana B. Nan amana C. hin amanu D. cimsee hin amanu E. Hinbeeku

Kutaa 4ffaa: Muuxannoo Keesan Kan yeroo Ulfaa waliinWalqabatu

Asirratti waa'ee ulfa dhiyoo darbee irratti dubbanna

1 ulfa dhiyoo darbe, daa ima garaatti si du'e deessee? A.Eeyyee _____ B.Lakki_____

2. Ulfa darbe irratti marsaa meeqa hordoffii da'umsa duraa dhaqxe? _____

3.ulfa darbe irratti Hordoffii da'umsa duraa yeroo jalqabaaf gaafa torbee ykn jia meeqa jalqabde ? _____ Hin yaadadhu _____

4. Yeroo ulfaa yoo rkkoon fayyaa isin quunnamu rakkoo fayyaa mudate sana irratti eenyutu murteessa?

A.Ana qofa B. Anaa fi abbaa manaakoo C.Abbaa manaa koo qofa

D.namoota biroo _____(ibsi)