www.idosr.org Omach, 2024

©IDOSR PUBLICATIONS ISSN: 2579-0781

International Digital Organization for Scientific Research IDOSRJES103.39.62
IDOSR JOURNAL OF EXPERIMENTAL SCIENCES 10(3) 39-62, 2024.
https://doi.org/10.59298/IDOSR/JES/103.39.62

# Prevalence and risk factors of Preterm Births in Northern Uganda: A Hospital-Based Study at Lira Regional Referral Hospital

**Omach Joshua**

**Faculty of Clinical Medicine and Dentistry Kampala International University Western Campus**

## ABSTRACT

This study aimed to assess the prevalence, proportions of early and late preterm births, and factors associated with preterm births among women delivering at Lira Regional Referral Hospital in Northern Uganda. It was a hospital-based cross-sectional observational and analytic study involving 382 women and their babies, with data collected via questionnaires and analyzed using STATA software version 14.0. Univariate analysis, as well as bivariate and multivariate logistic regression, were conducted to identify factors associated with preterm birth. The mean age of participants was 25.22 years, ranging from 16 to 40 years. The study found a preterm birth prevalence of 16.23% (95% CI: 12.52 – 19.94), with 66.13% (95% CI: 54.01 – 78.25) of preterm births categorized as late preterm and 33.87% (95% CI: 21.75 – 45.99) as early preterm. Factors independently associated with preterm birth included maternal age of 16 – 23 years (aOR 6.90, 95% CI: 2.08 – 22.94, P=0.002), antepartum hemorrhage (aOR 4.75, 95% CI: 1.82 – 12.40, P=0.001), prolonged pre-labor rupture of membranes (PROM) (aOR 5.70, 95% CI: 2.00 – 16.21, P=0.001), hemoglobin level <10g/dl (aOR 20.64, 95% CI: 6.19 – 68.89, P<0.001), and hypertension (aOR 7.51, 95% CI: 2.72 – 20.75, P<0.001). In conclusion, the preterm birth rate at Lira Regional Referral Hospital was 16.23%, with maternal age, antepartum hemorrhage, prolonged PROM, low hemoglobin levels, and hypertension identified as significant risk factors. Recognizing these risk factors can enhance awareness of high-risk pregnancies, improve preventive measures, and modify preterm care protocols in neonatal units.

**Keywords:** Preterm births, Women, Maternal age, haemorrhage, Haemoglobin.

## INTRODUCTION

Being born before 37 weeks of gestational age or before 259 days from the first day of a woman's last menstrual period is defined as preterm birth according to the WHO definition [1]. For much of the 20th century, was viewed as an unpredictable and inevitable fact of life. Medical efforts thus focused on ameliorating the consequences of prematurity rather than preventing its occurrence [2]. Most African countries have high absolute numbers of PTBs, related to high fertility and the large number of births in the region [3]. PTB is the second-leading cause of mortality in children aged <5 years, after pneumonia. Complications of PTBs are the largest cause of neonatal deaths. Globally, more than 3.1 million neonatal deaths occur every year, and about 35% of deaths are due to the prematurity of newborns [4]. Babies born prematurely have increased risks of neurological developmental disorders such as severe cerebral palsy, mental retardation, sensory disturbances (impaired vision, hearing impairment) and hydrocephalus, or problems like learning difficulties, language, impaired concentration or attention, hyperactivity, motor disabilities, and cognitive problems [5]. Historically, efforts have been primarily aimed at improving the survival and health of preterm infants (tertiary intervention). Such efforts, however, have not reduced the incidence of preterm birth. Increasingly, primary interventions that are directed at all women, and secondary interventions that reduce existing risks are looked upon as measures that need to be developed and implemented to prevent the health problems of premature infants and children [6]. Globally, preterm birth complications are the leading cause of death among children less than 5 years of age, responsible for approximately 1 million deaths in 2015 [7]. It contributes to 75% of all perinatal deaths, and 85% of neonatal deaths occur in preterm babies. Approximately three-fourths of perinatal deaths occur in fetuses that are delivered at <37 weeks, and about 40% of these deaths occur in those delivered at <32 weeks. Three-quarters of these deaths could be

prevented with current, cost-effective interventions [8]. In Brazil, neonatal mortality is currently responsible for almost 70% of deaths in the first year of life, and appropriate care for newborns has been one of the challenges in reducing infant mortality indexes [9]. It is estimated that approximately 12% of the total births of the Brazilian population are preterm, a higher rate than that observed in developed countries [10]. In India, it is estimated that 30% of babies are LBW, with nearly half being born full term. Whilst LBW prevalence and associated risk factors have been studied using national survey data, the generalizability of previous findings is limited due to the considerable heterogeneity between communities, particularly in rural areas. There is a sizeable population for which these data are not documented, leaving a major gap in existing literature [11]. South Asia and sub-Saharan Africa account for half the world's births, more than 60% of the world's preterm babies and over 80% of the world's 1.1 million deaths due to complications related to preterm birth. The survival chances of the 15 million babies born preterm each year vary significantly depending on where they are born [12]. The risk of neonatal death due to complications of preterm birth is at least 12 times higher for an African baby than for a European baby. For example, over 90% of extremely preterm babies (<28 weeks) born in low-income countries die within the first few days of life while only less than 10% of babies of this gestation die in high-income settings [13]. Nearly 3 million babies are born every year in Ethiopia and 10% of them are born prematurely or with low birth weight. New-born death contributes to 42% of under-five mortality. Preterm babies are the most vulnerable and at risk of death and disability within minutes of birth [14]. Uganda is the 28th country worldwide with a high preterm births rate of 13.6 per 1000 live births [12]. These preterm births are directly responsible for 25 percent of the 27 neonatal deaths per 1,000 live births [15]. Uganda indeed has to worker harder than before to reduce preterm birth incidence. This will require identifying ways to address preventable causes of preterm birth as a priority in low income countries [16]. Significant progress has been made in the care of premature infants but not in reducing the prevalence of preterm birth which is generally on the rise. Most countries lack reliable data on preterm birth.

### Problem statement

Pre-term birth (PTB) is a major determinant of neonatal mortality, morbidity and childhood disability and remains one of the most serious problems in obstetrics. Despite major preventive efforts, the incidence of PTB has remained constant at about 5–10% of live births in most countries over the past two decades [2]. Prematurity is increasingly recognized as a key public health priority in high, middle, and low-income countries. Though the particular challenges and burden of preterm birth varies by setting, rates are raising both nationally and globally [17]. Prematurity poses a heavy burden of death and disability to the neonate, pain and suffering to the concerned families [18]. Technological advances have provided better conditions of care and survival for children born prematurely, but the causes of these births are still little known [19]. Knowledge of risk factors is crucial for predicting the incidence of preterm birth in order to reduce the incidence of premature childbirth. Estimation of prevalence of preterm birth is required to implement interventions in order to reduce the risk of premature labor and delivery. Therefore, this will analyze the factors associated with pre- term births at the Lira Regional Referral Hospital. The result is expected to be a source of information for health professionals and the public about the risk factors for preterm birth so that prevention and early detection can be done more effectively.

## METHODOLOGY

### Study design and Rational

This was a hospital based observational cross-sectional study. The cross-sectional survey research design was used because the method gathers data from a relatively large number of different categories of respondents at a particular time in a qualitative manner without having to follow up the participants and hence it's cheaper on addition to being time saving [20].

### Area of Study

The study was conducted in Lira district, Northern Uganda. Lira District is located in Northern Uganda and is bordered by the districts of Pader in the North, Otuke and Alebtong in the East, Dokolo in the South; and Kole in the West. The study area is about 337 km from the capital city of Kampala. This area was selected for study because it is easily accessible by the researcher and at the same time, it is the researcher's area of origin. This made data collection easy for the researcher.

### Study population

All women delivering in the maternity ward of Lira Regional Referral Hospital comprised the study population.

### Target Population

The study targeted women with premature births.

### Sampling Technique.

Sampling was used to select a portion of the population to represent the entire population. The techniques selected for the study were based on Non-

probability sampling. The main method that was employed in selecting sample from the population was consecutive sampling technique.

**Non-probability sampling**

Convenience sampling technique was used with consecutive enrollment of all women delivered life babies. Both adults and emancipated minors who met the inclusion criteria were enrolled in the study. Convenience sampling method was used because participants were selected based on availability and willingness to take part in the study.

**Sample size determination**

Daniel's formula 2009) was used to determine the Sample size for the different specific objectives

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

Where,

n = Minimum sample size

Zα = Z-statistic at α=1.96; 95% level of confidence

Zβ = Z-statistic at β = 0.84

P = Prevalence of characteristic being estimated

d = Margin error, set at 0.05

The sample size of first 2 objectives of this study was calculated using the estimated proportion of 14.2% based on a study done from referral hospital in northern-eastern Tanzania [21].

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

$$n = \frac{(1.96 + 0.84)^2\, 0.142(1-0.142)}{(0.05)^2}$$

$$n = \frac{7.84\ x\ 0.142\ x\ 0.858}{0.0025}$$

$$n = 382$$

The sample size for factors associated with premature births among women attending Lira Regional Referral Hospital was calculated using the formula below.

$$n = \frac{(Z\alpha + Z\beta)^2\, 1/R\, p(1-p)}{d^2}$$

Where:

n = Desired sample size

zα = Z-statistic at α =1.96

$z_\beta$ = Z-statistic at β = 0.84

R = Odds ratio =8.8 in the variable of failure to attend antenatal Clinic [22].

p = 33.9%, based on a study done in Mulago Hospital, Kampala, Uganda [22].

d= Level of precision= 0.05

$$n = \frac{(1.96 + 0.84)^2\, 1/8.88\ 0.339(1-0.339)}{(0.05)^2}$$

$$n = \frac{7.84\ x\ 0.113x\ 0.339\ x\ 0.661}{0.0025}$$

$$n = 79$$

Therefore, the sample size for the specific objectives one and two was considered as the overall sample size, 382 was considered as the required sample size.

**Inclusion criteria**

All women who delivered from Lira Regional Referral Hospital during the study period and who consented to take part in the study were included in the study.

**Exclusion criteria**

- Women who never consented to take part in the study were excluded.
- Women who delivered dead babies were excluded from the study.

**Study procedure**

A hospital based cross sectional study was conducted. A total of 382 women delivering in the maternity ward of Lira regional referral hospital participated in the study after consenting. Relevant information from the women regarding socio-demographic factors, obstetric factors, medical factors and neonatal factors was filled in the interviewer-administered questionnaires.

**Screening and eligibility.**

Screening and inclusion of eligible study participants was done from the triage area in the department of obstetrics and Gynecology. The study proceeded after the mother and her neonate were all in stable general condition.

**Recruitment of Study Participants.**

The recruitment process was done by the research assistants on a daily basis. Using the birth registers, all mothers who delivered in LRRH were identified and traced to the postnatal wards or Neonatal intensive care unit within 24 hours of giving birth. Any mother who met the inclusion criteria was informed about the research and its purpose and was requested to participate by giving consent. Those gave their informed consent and their babies were recruited into the study. Administration of the questionnaire was done and the mother's left MUAC was measured. The baby was physically examined to assess for gestational age using the Finnstrom scoring chart. Additional information such as presence of any obstetric complications and antenatal profile was extracted from the mother's file and/or antenatal record. The process was done as summarized in the chart shown in figure 2 below.

**Consent.**

The purpose of the study was fully explained to the eligible women, who were then requested to sign a written informed consent or used a thumb print for those who were not be in position to write, in order to participate in the study. For the women who could not understand English, the consent was translated to Lango language. Emancipated mothers gave their

consent after being clearly informed about the risk and benefits of the study.

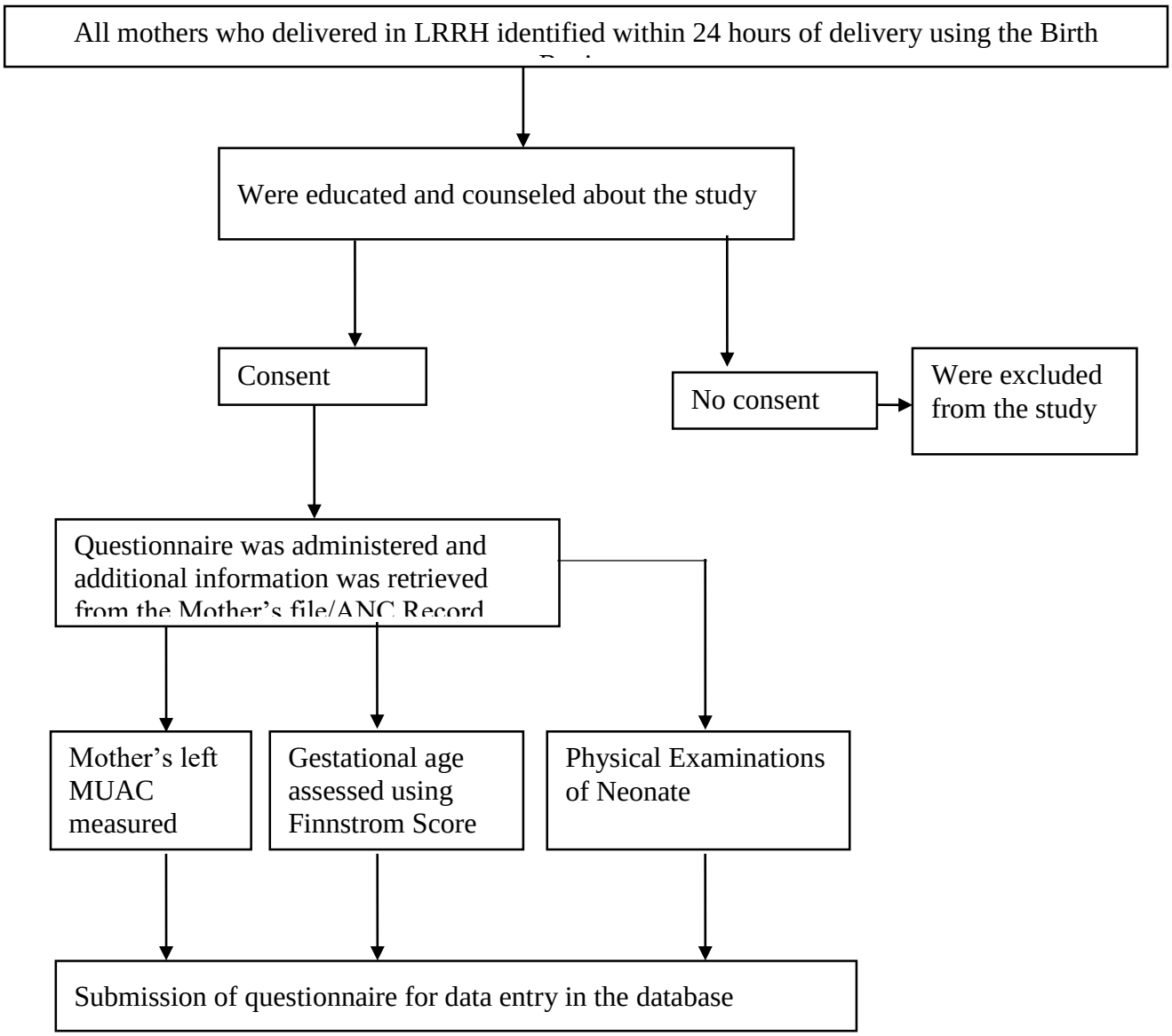


**Figure 1: Flow chart for patient flow during the period of data collection**

**Study Personnel**

The Principal Investigator (PI) obtained permission from the relevant authorities and introduced the research assistants to the in-charges of the maternity department and the NICU. The PI took the research assistants around the units for orientation and ensured that all materials needed were available. Data collection was done by three research assistants who were selected from a group of clinical officer volunteers and trained on data collection and supervised by the principal investigator who also ensured daily entry and back up of collected data.

**Gestational Age Assessment**

Gestational age was calculated using a standard obstetric wheel based on menstrual dates and confirmed within 24 hours of birth by clinical

assessment using the Finnstrom Score. This method of assessing gestational age was developed by Finnstrom et al in 1977. It involves seven (7) physical parameters which include scalp hair, skin opacity, length of fingernails, breast size, nipple formation, ear cartilage and plantar skin creases. (See Appendix V). It is a sensitive tool with the main advantage being that it does not include neurological signs that are difficult to assess in the very sick preterm babies such as those on ventilatory support. To limit observer bias, gestational assessment of all babies was done by the one research assistant who was trained by the principal investigator and aided by the Scoring Chart. Based on the gestational age, prematurity was categorized as extreme (less than 28 weeks), severe (28-31 weeks), moderate (32-33 weeks) and late preterm or near term (34-36 weeks).

**Maternal Nutritional Status**

Maternal nutritional status was assessed by measuring the left middle upper arm circumference (MUAC) using non-stretchable World Food Program MUAC tapes used for screening pregnant mothers. MUAC was a good screening tool and was a proxy indicator of pre-pregnancy nutritional status since it does not change much during pregnancy. It was also easy to perform. Most screening programs have used a cut off of 21-23cm. Given that there was no international consensus on the cut off to use, a MUAC of <24cm was chosen for this study.

**Data collection Instruments**

A data collection instrument refers a tool that is used in data collection such as a questionnaire. This provided a guide to the researcher to collect adequate data that allowed him answer the research questions to achieve the study objectives.

**Questionnaires**

The researcher used questionnaires as the main data collection tool. A questionnaire refers to a written form of questions that are systematically arranged to enable the researcher come up with clear findings that can answer the research questions.

Questionnaires are the most generally used instrument of all according to Langford (2001) because they are "easy to administer, inexpensive and offer anonymity. A questionnaire was the best instrument because it gave the respondents time to fill them without being intimidated by the researcher's presence.

**Validity of instruments**

Before the instruments were administered to research assistants for data collection, they were first examined by colleagues taking a similar program as the researcher's. They were then be scrutinized by the supervisor to ensure that the terms used in the questionnaire and interview were precisely defined and properly understood. Content Validity Index was calculated basing on judgment by at least two knowledgeable people (Judges). Since the result got was 0.9, the instrument was deemed valid for use.

**Pretesting of data collection tool**

The data collection tool was tested in Apac district hospital two weeks prior to the start of data collection. A few changes in the wordings and questions was done where needed.

**Proof and data analysis**

The data collection and entry process was planned in such a way that all data collection sheets completed in a day were reviewed and entered on the same day. Data was entered using Microsoft Excel spread sheet 13 and was analyzed using STATA 14.0, the information was summarized in the form of graphs, pie charts, narrations and tables to give descriptive statistics as per the theme of the study in one way or another. The prevalence of preterm births and the proportions of the clinical categories of preterm births was analyzed in terms of frequency and percentage with a 95% confidence interval and information was summarized in form of tables, pie charts and narrations. Descriptive statistics were reported to describe the variables and inferential statistics were used to establish associations between prematurity and the various risk factors using a chi-square analysis while a multivariate logistic regression was used to determine the factors independently associated with preterm birth. Fisher's exact test was used to analyze the factors associated with early (<34 Weeks gestation) preterm birth. Presentation of data was done in the form of tables, charts and graphs. The variables in the final multivariate model were significant when $p < 0.05$. The measure of association was reported as odds ratios (ORs) with corresponding 95% CI and p-value. All statistical analyses were carried out in STATA version 14.0.

**Quality assurance and quality control**

The research assistants were trained and provided with a guide for the study with definitions of the terminologies used in the questionnaires to ensure uniform interpretation. All data collected were reviewed at two levels prior to data entry into the research database and upon entry prior to analysis. All tools were tested for relevancy to ease the understanding and appropriateness before data collection. This helped the researchers to ensure accuracy, validity and reliability of the tools in order to find out the relevancy of the study objectives to the study area [23]. These pre-test questionnaires were not included in the final data analysis.

**Ethical considerations**

The study was carried out only after approval by the Research Committee of Kampala International University. Approval was also sought from the

administration of Lira regional referral hospital where the research was conducted. Respondents' names were not included anywhere in the Data that was collected and; they were instead referred to using codes. In this research autonomy was protected by ensuring that any consent to participate in the study was informed or real. Those who consented to take part in the proposed study were neither paid nor given any form of compensation for participating in the study but their participation in the study contributed to the health sector by providing information which could improve the management of prematures in our country Uganda [24].

## RESULTS

### Maternal Socio-Demographic Characteristics of the Study Participants

A total of 382 participants were sampled from the maternity ward of Lira Regional Referral Hospital as presented in table 1 below. Majority of the study participants 46.07% (176/382) were in the age group of 16 – 23 years whereas minority of participants 03.93% (15/382) were 38 years and above. When asked about their religion, majority of study participants 43.72% (167/382) said that they are Catholics whereas 03.14% (12/382) of the study participants were Muslims. Pertaining to area of residence, majority of the study participants 60.21% (263/382) said that they resided in rural areas meanwhile 39.79% (153/382) resided in urban areas. The highest proportion of study participants 68.85% (263/382) were married while the minority 31.15% (119/382) were unmarried. Secondary level of education had been attained by majority of the study participants 38.74 (148/382) whereas 04.19% (16/382) were not educated at all. Regarding occupation of study participants, 27.49% (105/382) were private employees meanwhile 18.85% (72/382) of the study participants were self-employed. When asked whether they had ever smoked, 72.25% (276/382) had a negative history of smoking cigarettes whereas 27.75% (106/382) had a positive history of smoking cigarettes. Finally, more than half of the study participants 59.16% (226/382) had a negative history of alcohol consumption meanwhile 40.84% (156/382) of the participants had a positive history of alcohol consumption.

**Table 1: maternal socio-demographic characteristics of the study participants**

| Category | Options | Frequency(N) | Percentage (%) |
|---|---|---|---|
| Age of the **mothers** in **y**ears | 16 – 23 Years | 176 | 46.07 |
| | 24 – 30 Years | 136 | 35.60 |
| | 31 – 37 Years | 55 | 14.40 |
| | 38 Years and above | 15 | 03.93 |
| | **Total** | **382** | **100** |
| Religion | Catholic | 167 | 43.72 |
| | Anglican | 158 | 41.36 |
| | Jehovah Witness | 41 | 10.73 |
| | Muslim | 12 | 03.14 |
| | Others | 04 | 01.05 |
| | **Total** | **382** | **100** |
| Residential Area | Urban | 153 | 39.79 |
| | Rural | 263 | 60.21 |
| | **Total** | **382** | **100** |
| Marital status | Unmarried | 119 | 31.15 |
| | Married | 263 | 68.85 |
| | **Total** | **382** | **100** |
| Level of Education | None | 16 | 04.19 |
| | Primary | 125 | 2.72 |
| | Secondary | 148 | 38.74 |
| | Tertiary | 93 | 24.35 |
| | **Total** | **382** | **100** |
| Occupation of the mother | Peasant | 48 | 12.57 |
| | Business | 75 | 19.63 |
| | Civil Servant | 82 | 21.47 |
| | Private Employee | 105 | 27.49 |
| | Self Employed | 72 | 18.85 |
| | **Total** | **382** | **100** |
| History of Smoking Cigarettes | Yes | 106 | 27.75 |
| | No | 276 | 72.25 |
| | **Total** | **382** | **100** |
| History of Alcohol Consumption | Yes | 156 | 40.84 |
| | No | 226 | 59.16 |
| | **Total** | **382** | **100** |

Shown in table 2 below are the summary statistics of maternal age. There were 382 mothers. The mean age of the study participants was 25.22 years with a standard deviation of 5.87 years from the mean. The minimum age was 16 years meanwhile the maximum age was 40 years. The data on maternal age had a variance of 34.50 with a positive skewness of 0.64 and a platy kurtosis of 2.48.

**Table 2: Shows the descriptive statistics of maternal age**

| Observations | Mean | STD Dev | Minimum | Maximum | Variance | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| 382 | 25.22 | 5.87 | 16 | 40 | 34.50 | 0.64 | 2.48 |

**Infant Socio-Demographic Characteristics**

Presented in table 3 are the socio-demographic characteristics of the infants who were recruited to participate in this study. As observed from the table, majority of the infants 55.76% (211/382) were females whereas 44.76% (171/382) were males. Results have revealed that, majority of the infants 61.78% (236/382) had a birth order of 2 meanwhile 11.52% (44/382) of the participants had birth intervals of 3. Majority of the infants 73.30% (280/382) were singleton whereas 26.70% (102/382) were born multiple. Lastly, majority of mothers to the infants 88.74% (339/382) never had genetic defects whereas 11.26% (43/382) were found to be having genetic defects.

**Table 3: Infant Socio-Demographic Characteristics**

| Category | Options | Frequency(N) | Percentage (%) |
|---|---|---|---|
| Gender of the infant | Male | 171 | 44.76 |
| | Female | 211 | 55.76 |
| | **Total** | **382** | **100** |
| Birth Order of The Baby | 1 | 102 | 26.70 |
| | 2 | 236 | 61.78 |
| | 3 | 44 | 11.52 |
| | **Total** | **382** | **100** |
| Number Of Babies Delivered | Single | 280 | 73.30 |
| | Multiple | 102 | 26.70 |
| | **Total** | **382** | **100** |
| Genetic Defects or Congenital Anomaly | Present | 43 | 11.26 |
| | Absent | 339 | 88.74 |
| | **Total** | **382** | **100** |

Shown in table 4 is the summary of distribution of weight of the infants in grams. There were 382 infants who took part in the study. The mean weight was 2,973g with a standard deviation of 971 from the mean. The minimum weight of the infants was 900g whereas the maximum weight was 5,000g. The data on weight of infants had a variance 941,907, a positive skewness of 0.16 and a platy kurtosis of 2.26.

**Table 4: Summary statistics of age of the infants in months**

| Observations | Mean | Std Dev | Minimum | Maximum | Variance | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| **382** | 2973 | 971 | 900 | 5000 | 941907 | 0.16 | 2.26 |

**Obstetric Characteristics of the study participants**

Table 5 shows the frequencies and percentages of maternal obstetric characteristics of the study participants. It can be observed from the table that majority of the study participants 82.20% (314/382) had gravidity of less than 6 while 17.80% (68/382) had gravidity of 6 and above. Majority of the participants 40.05% (153/382) delivered children who had birth interval of 8 – 21 months whereas 08.90% (34/382) delivered children who had birth interval of 31 months or more. The highest proportion of study participants 80.63% (308/382) said were previous children were alive as opposed to the 01.05% (04/382) said they had miscarriage during the previous pregnancy. Regarding the history of producing one month earlier than the expected delivery date, majority of the study participants 71.99% (275/382) had a negative history meanwhile 28.01% (107/382) had a positive history. Majority of respondent 69.90 (267/382) delivered by spontaneous vaginal delivery whereas the minority 08.12% (31/382) of the study participants delivered by breech. The onset of labour was spontaneous among 70.68% (270/382) of the study participants whereas 29.32% (112/382) of the study participants got induced labor. Majority of study participants 85.86% (328/382) had attended ANC meanwhile 14.14% (54/382) had not attended ANC. The study revealed that 50.26% (192/382) had attended ANC ≥ 4 times meanwhile 49.74% (190/382) had attended ANC less than 4 times. More than half of the study participants, 59.95% (229/382) did not suffer from antepartum hemorrhage meanwhile 40.05% (153/382) had suffered from antepartum hemorrhage. Majority of respondents 54.97% (210/382) of the women had positive history of drainage of liquor while minority 45.03% (172/382) had negative history of drainage of liquor.

**Table 5: Frequency table for socioeconomic characteristics of study participants**

| Category | Options | Frequency(N) | Percentage (%) |
|---|---|---|---|
| Gravidity | <6 | 314 | 82.20 |
| | ≥6 | 68 | 17.80 |
| | **Total** | **382** | **100** |
| Birth Interval | 8 – 21 Months | 153 | 40.05 |
| | 22 – 30 Months | 195 | 51.05 |
| | 31 Or + Months | 34 | 08.90 |
| | **Total** | **382** | **100** |
| Status of the previous baby | Alive | 308 | 80.63 |
| | Dead | 42 | 10.99 |
| | Prime Gravid | 28 | 07.33 |
| | Miscarriage | 04 | 01.05 |
| | **Total** | **382** | **100** |
| History of producing earlier than EDD | Yes | 107 | 28.01 |
| | No | 275 | 71.99 |
| | **Total** | **382** | **100** |
| Mode of Delivery | Svd | 267 | 69.90 |
| | Breech | 31 | 08.12 |
| | C/Section | 84 | 21.99 |
| | **Total** | **382** | **100** |
| Onset of Labor | Spontaneous | 270 | 70.68 |
| | Induced | 112 | 29.32 |
| | **Total** | **382** | **100** |
| ANC Attendance | Yes | 328 | 85.86 |
| | No | 54 | 14.14 |
| | **Total** | **382** | **100** |
| Number of times attended ANC | <4 Times | 190 | 49.74 |
| | ≥ 4 Times | 192 | 50.26 |
| | **Total** | **382** | **100** |
| Antepartum Hemorrhage | Yes | 153 | 40.05 |
| | No | 229 | 59.95 |
| | **Total** | **382** | **100** |
| History of drainage of liquor | Yes | 210 | 54.97 |
| | No | 172 | 45.03 |
| | **Total** | **382** | **100** |

**Medical Characteristics of the study participants**

Table 6 shows the medical characteristics of the study participants. From the table, it can be observed that majority of the participants 71.99% (275/382) did not have diabetes mellitus whereas 28.01% (107/382) were found to be having diabetes mellitus. Results showed that 80.63% (308/382) of the study participants never had syphilis meanwhile 19.37% (74/382) had syphilis. Majority of study participants 76.44% (292/382) were found to be HIV negative meanwhile 23.56% (90/382) were HIV positive. Majority of women who participated in the study 80.10% (306/382) were having hemoglobin level of ≥10g/dl while 19.90% (76/382) had hemoglobin level of <10g/dl. On the other hand, 71.99% (275/382) never had hypertension whereas 28.01% (107/382) had hypertension. Urinary tract infection during pregnancy affected 39.27% (150/382) of the study participants meanwhile 60.73% (232/382) did not suffer from urinary tract infection during pregnancy. More than half of the study participants 55.76% (213/382) had MUAC of ≥ 24 cm whereas 44.24% (169/382) had MUAC of <24 cm. Lastly, 71.99% (275/382) of the study participants had heights of ≥ 145 cm meanwhile 28.01% (107/383) had heights of <145 cm.

**Table 6: Shows Medical Characteristics of the study participants**

| Category | Options | Frequency(N) | Percentage (%) |
|---|---|---|---|
| Diabetes Mellitus | Yes | 107 | 28.01 |
| | No | 275 | 71.99 |
| | **Total** | **382** | **100** |
| Syphilis | Yes | 74 | 19.37 |
| | No | 308 | 80.63 |
| | **Total** | **382** | **100** |
| HIV Status | Positive | 90 | 23.56 |
| | Negative | 292 | 76.44 |
| | **Total** | **382** | **100** |
| Hemoglobin | <10g/Dl | 76 | 19.90 |
| | ≥10g/Dl | 306 | 80.10 |
| | **Total** | **382** | **100** |
| Hypertension | Yes | 107 | 28.01 |
| | No | 275 | 71.99 |
| | **Total** | **382** | **100** |
| Urinary Tract Infection | Yes | 150 | 39.27 |
| | No | 232 | 60.73 |
| | **Total** | **382** | **100** |
| MUAC | <24 Cm | 169 | 44.24 |
| | ≥ 24 Cm | 213 | 55.76 |
| | **Total** | **382** | **100** |
| Height | <145 Cm | 107 | 28.01 |
| | ≥ 145 Cm | 275 | 71.99 |
| | **Total** | **382** | **100** |

**The Prevalence of Preterm Births among Women Delivering at Lira Regional Referral Hospital**

***Overall Prevalence of Preterm Birth***

Table 7 below shows the overall prevalence of preterm birth among women who delivered at Lira Regional Referral hospital during the study period. It can be observed that the prevalence of preterm birth was 16.23% (27.27/176) with a 95% confidence interval of 12.52 – 19.94.

**Table 7: The overall prevalence of preterm birth**

| Birth status | Frequency | Percentage | 95% CI |
|---|---|---|---|
| Preterm | 62 | 16.23 | 12.52 – 19.94 |
| Term | 320 | 83.77 | 80.06 – 87.48 |

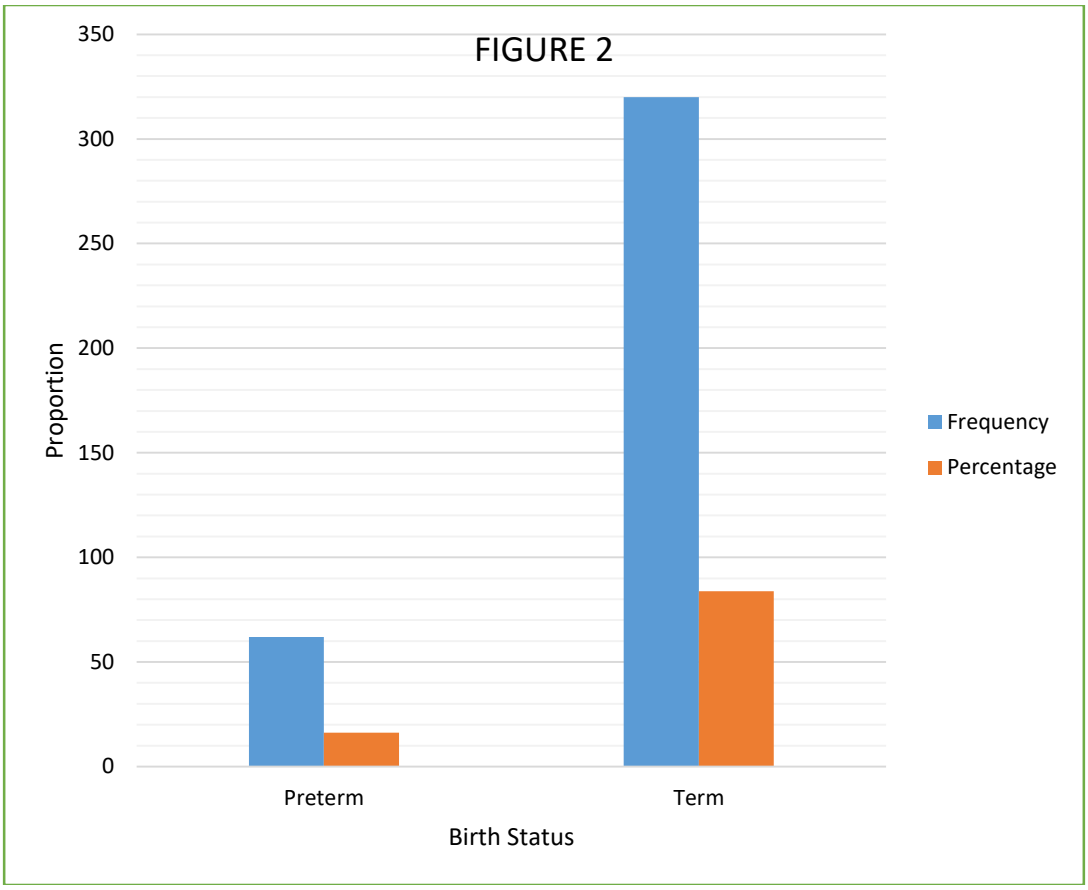


**Figure 2: Column graph showing the overall prevalence of preterm birth**

**Infant Gender-Specific Prevalence of preterm Birth**

Table 8 shows the infant gender specific prevalence of preterm birth at Lira Regional Referral Hospital. The highest prevalence of preterm birth was among male infants accounting for 21.64% (37/171) with a 95% confidence interval of 15.40-27.87. On the other hand, the prevalence of preterm birth among female infants was 11.85% (25/211) with a 95% CI of 07.45-16.24. The difference in the prevalence of preterm birth across the different genders was statistically significant with a P value of 0.010 and a chi square value of 6.66.

**Table 8: Infant Gender-Specific Prevalence of preterm Birth among Women Delivering at Lira Regional Referral Hospital**

| Gender of the infant | Total | Birth status | | Chi Square (X2) | P Value |
|---|---|---|---|---|---|
| | | Term Count, % (95% CI) | Preterm Count, % (95% CI) | | |
| **Male** | 171 | 13478.36% (72.13-84.60) | 3721.64% (15.40-27.87) | 6.66 | 0.010 |
| **Female** | 211 | 186 88.15% (83.76-92.55) | 25 11.85% (07.45-16.24) | | |

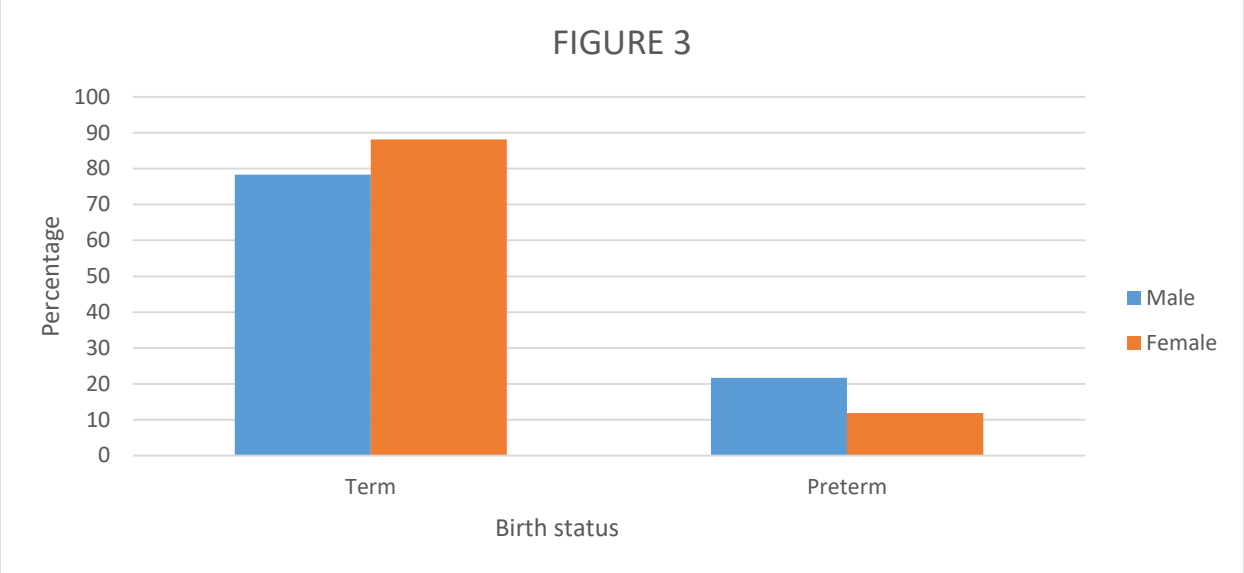


**Figure 3: Infant Gender-Specific Prevalence of preterm Birth**

**Infant Weight-Specific Prevalence of preterm Birth**

Table 9 shows the infant weight-specific prevalence of preterm birth at Lira Regional Referral Hospital. The highest prevalence of preterm birth was among infants have birth weight of <1000g accounting for 100% (03/03) followed by infants who had birth weight of 1000 – 1499g and this accounted for 80.00% (08/10) with a 95% confidence interval of 49.84-100.10. The difference in the prevalence of preterm birth across the different birth weights was statistically significant with a P value less than 0.001 and a chi square value of 113.82.

**Table 9: Infant weight-Specific Prevalence of preterm Birth among Women Delivering at Lira Regional Referral Hospital**

| Weight of the infant | Total | Birth status | | Chi Square (X2) | P-Value |
|---|---|---|---|---|---|
| | | Term Count, % (95% CI) | Preterm Count, % (95% CI) | | |
| <1000g | 03 | 0000.00% (--) | 03100.00% (--) | | |
| 1000 – 1499g | 10 | 0220.00% (-0.10-50.1) | 0880.00% (49.84-100.10) | | |
| 1500 – 2499g | 102 | 660.78% (51.15-70.42) | 4039.22% (29.58-48.85) | 113.82 | <0.001 |
| ≥2500g | 267 | 25695.88% (93.48-98.28) | 1104.12% (01.72-06.52) | | |

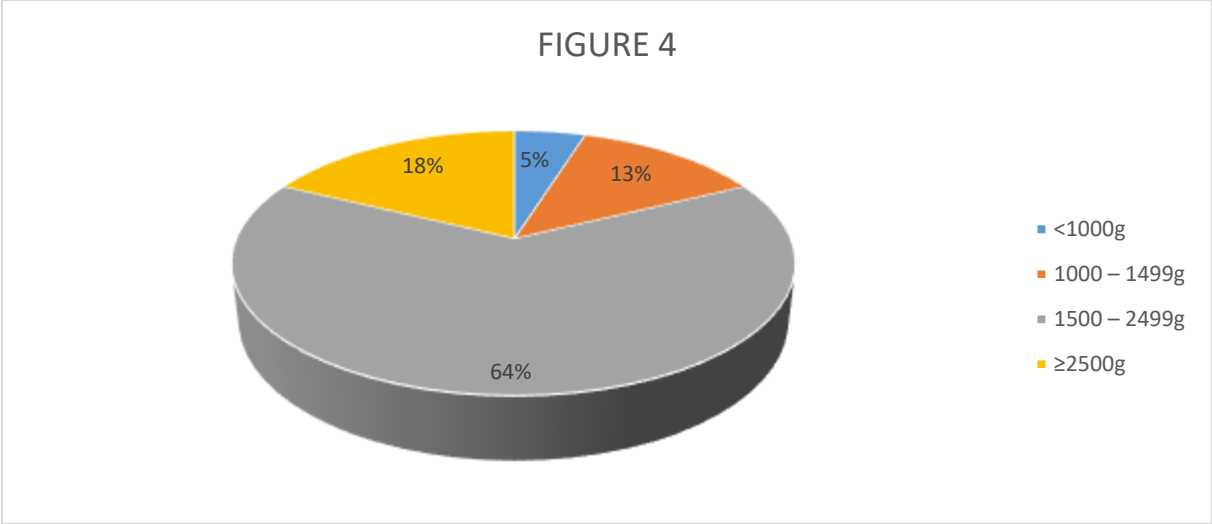


**Figure 4: Pie Chart showing Distribution of preterm birth according to weight**

**The Proportions of Early and Late Preterm Births among Women Delivering at Lira Regional Referral Hospital.**

**Proportion of Early and Late Preterm Birth**

Table 10 below shows the proportion of early and late preterm birth at Lira Regional Referral hospital during the study period. The table shows that majority of the study participants 66.13% (41/62) were late preterm at 95% CI of 54.01 – 78.25 meanwhile the remaining 33.87% (21/62) were early preterm at 95% CI of 21.75 – 45.99

**Table 10: Overall proportion of Early and Late Preterm Birth**

| Preterm Birth | Frequency | Percentage | 95% CI |
|---|---|---|---|
| Early Preterm | 21 | 33.87 | 21.75 – 45.99 |
| Late Preterm | 41 | 66.13 | 54.01 – 78.25 |

**Infant Gender-Specific proportion of Early and Late Preterm Birth**

Shown in table 11 below is the infant gender specific proportion of early preterm and late preterm at Lira Regional Referral Hospital. More early preterm births were found among male infants 37.84% (14/37) with a 95% confidence interval of 21.44-54.23. On the other hand, majority of late preterm births 72.00% (18/25) were among female infants at 95% CI of 53.08-90.92. The difference in the proportion of late and early preterm birth across the different genders was statistically not significant with a P value of 0.422 and a chi square value of 0.644.

**Table 11: Infant Gender-Specific proportion of Early and Late preterm Birth**

| Gender of the infant | Total | Preterm | | Chi Square (X2) | P-Value |
|---|---|---|---|---|---|
| | | Early Count, % (95% CI) | Late Count, % (95% CI) | | |
| Male | 37 | 1437.84% (21.44-54.23) | 2362.16% (45.77-78.56) | 0.644 | 0.422 |
| Female | 25 | 0728.00% (09.08-46.92) | 1872.00% (53.08-90.92) | | |

**The Factors Associated with Preterm Births Among Women Delivering at Lira Regional Referral Hospital.**

*Bivariate Logistic Regression to Show Maternal Socio-Demographic Factors Associated with Preterm Births Among Women Delivering at Lira Regional Referral Hospital.*

The researcher run a bivariate logistic regression to identify maternal socio demographic factors associated with preterm birth among women delivering at Lira Regional Referral hospital. Results showed that 3 maternal socio-demographic factors were statistically associated with preterm birth as shown in table 12. The statistically significant factors include; Age, Marital status and level of education. Women who were in the age group of 16 – 23 years were 2.48 times more likely to deliver preterm babies as compared to women who were in the age group of

24 – 30 years (cOR 2.48, 95%CI 1.29 – 4.79, P=0.007). Study participants who were married were 55% protected from delivering preterm babies than the unmarried study participants (cOR 0.45, 95%CI 0.26 – 0.78, P=0.004). Lastly, study participants who had no education were 4.17 times more likely to have preterm births than study participants who were having tertiary level of education (cOR 4.17, 95%CI 1.38 – 12.60, P=0.011).

**Table 12: Result of Bivariate Logistic Regression to Show Maternal Socio-Demographic Factors Associated with Preterm Births Among Women Delivering at Lira Regional Referral Hospital.**

| Variable | Category | Preterm | | cOR | 95% CI | P VALUE |
|---|---|---|---|---|---|---|
| | | NO=320 n (%) | YES=62 n (%) | | | |
| Age of the mothers in Years | 16 – 23 Years | 137 (77.84) | 39 (22.16) | 2.48 | 1.29 – 4.79 | **0.007** |
| | 24 – 30 Years | 122 (89.71) | 14 (10.29) | Reference | | |
| | 31 – 37 Years | 48 (87.27) | 07 (12.73) | 1.27 | 0.48 – 3.34 | 0.627 |
| | 38 Years and above | 13 (86.67) | 02 (13.33) | 1.34 | 0.27 – 6.56 | 0.717 |
| Religion | Catholic | 136 (81.44) | 31 (18.56) | Reference | | |
| | Anglican | 136 (86.08) | 22 (13.92) | 0.71 | 0.39 – 1.29 | 0.259 |
| | Jehovah witness | 33 (86.08) | 08 (19.51) | 1.06 | 0.45 – 2.53 | 0.889 |
| | Muslim | 11 (91.67) | 01 (08.33) | 0.40 | 0.05 – 3.21 | 0.387 |
| | Others | 04 (91.67) | 00 (0.00) | 1.00 | Omitted | |
| Residential Area | Urban | 133 (87.50) | 19 (12.50) | Reference | | |
| | Rural | 187 (81.30) | 43 (18.70) | 1.61 | 0.90 – 2.89 | 0.110 |
| Marital status | Unmarried | 90 (75.63) | 29 (24.37) | Reference | | |
| | Married | 230 (87.45) | 33 (12.55) | 0.45 | 0.26 – 0.78 | **0.004** |
| Level of Education | None | 08 (50.00) | 08 (50.00) | 4.17 | 1.38 – 12.60 | **0.011** |
| | Primary | 108 (86.40) | 17 (13.60) | 0.66 | 0.32 – 1.35 | 0.254 |
| | Secondary | 129 (87.16) | 19 (12.84) | 0.61 | 0.30 – 1.24 | 0.174 |
| | Tertiary | 75 (80.65) | 18 (19.35) | Reference | | |
| Occupation of the mother | Peasant | 32 (66.67) | 16 (33.33) | 5.50 | 1.96 – 15.39 | 0.001 |
| | Business | 55 (73.33) | 20 (26.67) | 4.00 | 1.50 – 10.66 | 0.006 |
| | Civil Servant | 70 (85.37) | 12 (14.63) | 1.89 | 0.67 – 5.31 | 0.230 |
| | Private Employee | 97 (92.38) | 08 (07.62) | 0.91 | 0.30 – 2.74 | 0.863 |
| | Self employed | 66 (91.67) | 06 (08.33) | Reference | | |
| Smoking Cigarettes | Yes | 87 (82.08) | 19 (17.92) | Reference | | |
| | No | 233 (84.42) | 43 (15.58) | 0.85 | 0.47 – 1.53 | 0.578 |
| Alcohol Consumption | Yes | 133 (85.26) | 23 (14.74) | Reference | | |
| | No | 187 (82.74) | 39 (17.26) | 1.21 | 0.69 – 2.11 | 0.513 |

**cOR= Crude odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level**

**Bivariate Logistic Regression to determine Infant Socio-Demographic Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital**

After running a bivariate logistic regression to determine the infant socio-demographic factors associated with preterm birth, two infant socio-demographic factors were found to be significantly associated with preterm birth namely; gender of the infant and number of babies delivered. Male babies were 2.05 times more likely to be born as preterm than the female babies (cOR 2.05, 95%CI 1.18 – 3.57, P=0.011). On the other hand, being born multiple was associated with preterm birth by 7.57 folds than being born single (cOR 2.05, 95%CI 4.20 – 13.64, P<0.001).

**Table 13: Result of Bivariate Logistic Regression to determine Infant Socio-Demographic Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital.**

| Variable | Category | Preterm | | cOR | 95% CI | P VALUE |
|---|---|---|---|---|---|---|
| | | NO=320 n (%) | YES=62 n (%) | | | |
| Gender of the infant | Male | 134 (78.36) | 37 (21.64) | 2.05 | 1.18 – 3.57 | **0.011** |
| | Female | 186 (88.15) | 25 (11.85) | Reference | | |
| Birth Order of the baby | 1 | 87 (85.29) | 15 (14.71) | Reference | | |
| | 2 | 193 (81.78) | 43 (18.22) | 1.29 | 0.68 – 2.45 | 0.432 |
| | 3 | 40 (90.91) | 04 (09.09) | 0.58 | 0.18 – 1.86 | 0.359 |
| Number of babies delivered | Single | 258 (92.14) | 22 (07.86) | Reference | | |
| | Multiple | 62 (60.78) | 40 (39.22) | 7.57 | 4.20 – 13.64 | **<0.001** |
| Genetic defects or Congenital anomaly | Present | 34 (79.07) | 09 (20.93) | Reference | | |
| | Absent | 286 (84.37) | 53 (15.63) | 0.70 | 0.32 – 1.54 | 0.377 |

**cOR= Crude odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level**

**Bivariate Logistic Regression to establish Obstetric Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital.**

Table 14 below shows the results of a bivariate logistic regression which was run to establish obstetric factors associated with preterm births among women delivering at Lira Regional Referral Hospital. Results showed that Mode of deliver, number of ANC visits, Antepartum Hemorrhage, and prolonged PROM were significantly associated with preterm birth. Women who delivered by C/section were 2.28 times more likely to have preterm births than women who delivered by Spontaneous vaginal delivery (cOR 2.28, 95%CI 1.24 – 4.21.64, P=0.008). Participants who had attended ANC foe less than 4 times were 2.06 times more likely to have preterm births as compared to participants who had attended ANC 4 times or more (cOR 2.06, 95%CI 1.17 – 3.62, P=0.012). Study participants who had antepartum hemorrhage were 2.40 times more likely to have preterm birth as compared to study participants who never had antepartum hemorrhage (cOR 2.40, 95%CI 1.38 – 4.18, P=0.002). Finally, study participants who had prolonged PROM were 2.27 times more likely to deliver preterm babies than study participants who never had prolonged PROM (cOR 2.27, 95%CI 1.26 – 4.09, P=0.007).

**Table 14: Results of Bivariate Logistic Regression to establish Obstetric Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital**

| Variable | Category | Preterm | | cOR | 95% CI | P VALUE |
|---|---|---|---|---|---|---|
| | | NO=320 n (%) | YES=62 n (%) | | | |
| Gravidity | <6 | 265 (84.39) | 49 (15.61) | Reference | | |
| | ≥6 | 55 (80.88) | 13 (19.12) | 1.28 | 0.65 – 1.63 | 0.784 |
| Birth Interval | 8 – 21 months | 127 (83.01) | 26 (16.99) | Reference | | |
| | 22 – 30 months | 164 (84.10) | 31 (15.90) | 0.92 | 0.52 – 1.63 | 0.784 |
| | 31 or + months | 29 (85.29) | 05 (14.71) | 0.84 | 0.30 – 2.38 | 0.746 |
| Status of the previous baby | Alive | 258 (83.77) | 50 (16.23) | Reference | | |
| | Dead | 37 (88.10) | 05 (11.90) | 0.70 | 0.26 – 1.86 | 0.472 |
| | Prime gravid | 22 (78.57) | 06 (21.43) | 1.41 | 0.54 – 3.65 | 0.482 |
| | Miscarriage | 03 (75.00) | 01 (25.00) | 1.72 | 0.18 – 16.87 | 0.642 |
| History of producing earlier than EDD | Yes | 81 (75.70) | 26 (24.30) | 2.13 | 1.21 – 3.75 | 0.009 |
| | No | 239 (86.91) | 36 (13.09) | Reference | | |
| Mode of Delivery | SVD | 233 (87.27) | 34 (12.73) | Reference | | |
| | Breech | 24 (77.42) | 07 (22.58) | 2.00 | 0.80 – 5.00 | 0.138 |
| | C/Section | 63 (75.00) | 21 (25.00) | 2.28 | 1.24 – 4.21 | **0.008** |
| Onset of Labor | Spontaneous | 228 (84.44) | 42 (15.56) | Reference | | |
| | Induced | 92 (82.14) | 20 (17.86) | 0.49 | 0.66 – 2.12 | 0.579 |
| ANC Attendance | Yes | 271 (82.62) | 57 (17.38) | Reference | | |
| | No | 49 (90.74) | 05 (09.26) | 0.49 | 0.19 – 1.27 | 0.141 |
| Number of times attended ANC | <4 times | 150 (78.95) | 40 (21.05) | 2.06 | 1.17 – 3.62 | **0.012** |
| | ≥ 4 times | 170 (88.54) | 22 (11.46) | Reference | | |
| Antepartum Hemorrhage | Yes | 117 (76.47) | 36 (23.53) | 2.40 | 1.38 – 4.18 | **0.002** |
| | No | 203 (88.65) | 26 (11.35) | Reference | | |
| Prolonged PROM | Yes | 166 (79.05) | 44 (20.95) | 2.27 | 1.26 – 4.09 | **0.007** |
| | No | 154 (89.53) | 18 (10.47) | Reference | | |

**cOR= Crude odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level**

**Bivariate Logistic Regression to identify Medical Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital.**

Four medical factors were found to be associated with preterm birth as shown in table 15. The factors include; Being non diabetic (cOR 1.96, 95%CI 1.11 – 3.45, P=0.020), Hemoglobin of <10g/dl (cOR 4.47, 95%CI 2.37 – 7.67, P<0.001), Being Hypertensive (cOR 4.47, 95%CI 2.53 – 7.87, P<0.001), and Urinary tract infection during pregnancy (cOR 1.83, 95%CI 1.06 – 3.16, P=0.031).

**Table 15: Results of Bivariate Logistic Regression to identify Medical Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital.**

| Variable | Category | Preterm | | cOR | 95% CI | P VALUE |
|---|---|---|---|---|---|---|
| | | NO=320 n (%) | YES=62 n (%) | | | |
| **Diabetes Mellitus** | Yes | 82 (76.64) | 25 (23.36) | Reference | | |
| | No | 238 (86.55) | 37 (13.45) | 1.96 | 1.11 – 3.45 | **0.020** |
| **Syphilis** | Yes | 63 (85.14) | 11 (14.86) | Reference | | |
| | No | 257 (83.44) | 51 (16.56) | 1.14 | 0.56 – 2.31 | 0.723 |
| **HIV Status** | Positive | 70 (77.78) | 20 (22.22) | Reference | | |
| | Negative | 250 (85.62) | 42 (14.38) | 0.59 | 0.32 – 1.07 | 0.080 |
| **Hemoglobin** | <10g/dl | 49 (64.47) | 27 (35.53) | 4.47 | 2.37 – 7.67 | **<0.001** |
| | ≥10g/dl | 271 (88.56) | 35 (11.44) | Reference | | |
| **Hypertension** | Yes | 72 (67.29) | 35 (32.71) | 4.47 | 2.53 – 7.87 | **<0.001** |
| | No | 248 (90.18) | 27 (09.82) | Reference | | |
| **Urinary Tract Infection** | Yes | 118 (78.67) | 32 (21.33) | 1.83 | 1.06 – 3.16 | **0.031** |
| | No | 202 (87.07) | 30 (12.93) | Reference | | |
| **MUAC** | <24 cm | 135 (79.88) | 34 (20.12) | Reference | | |
| | ≥ 24 cm | 185 (86.85) | 28 (13.15) | 0.60 | 0.35 – 1.04 | 0.068 |
| **Height** | <145 cm | 85 (79.44) | 22 (20.56) | Reference | | |
| | ≥ 145 cm | 235 (85.45) | 40 (14.55) | 0.66 | 0.37 – 1.17 | 0.154 |

**cOR= Crude odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level**

**Multivariate Logistic Regression to Determine Factors Independently Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital.**

Shown in table 16 are the results of multivariate logistic regression which was run to identify factors independently associated with preterm birth. Variables with p-value less than 0.20 at bivariate logistic regression analysis were considered for multivariate analysis. Through a stepwise logistic regression with removal of least significant variable in each step, maternal age, antepartum hemorrhage, prolonged PROM, hemoglobin level and hypertension remained independently associated with preterm births among the study participants. Those who were in the age group of 16 – 23 years were 6.90 times more likely to give birth to preterm babies than their counterparts who were in the age group of 24 – 30 years (aOR 6.90, 95%CI 2.08 – 22.94, P=0.002). Mothers who had antepartum hemorrhage were 4.75 times more likely to have preterm births than women who never had antepartum hemorrhage (aOR 4.75, 95%CI 1.82 – 12.40, P=0.001). Study participants who had prolonged PROM had 5.70 folds the chances of giving birth to preterm babies as compared to their counterparts who never had prolonged PROM (aOR 5.70, 95%CI 2.00 – 16.21, P=0.001). Those who had hemoglobin level of <10g/dl were 20.64 times more likely to have preterm births than those who had hemoglobin level of ≥10g/dl (aOR 20.64, 95%CI 6.19 – 68.89, P<0.001). Lastly, women who were hypertensive were 7.51 folds more likely to have preterm births than their counterparts who were non hypertensive (aOR 7.51, 95%CI 2.72 – 20.75, P<0.001).

**Table 16: Results of Multivariate Logistic Regression to Determine Factors Independently Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital**

| Variable | Category | Preterm | | aOR | 95% CI | P VALUE |
|---|---|---|---|---|---|---|
| | | NO=320 n (%) | YES=62 n (%) | | | |
| Age of the mothers in Years | 16 – 23 Years | 43 (67.19) | 21 (32.81) | 6.90 | 2.08 – 22.94 | **0.002** |
| | 24 – 30 Years | 53 (81.54) | 12 (18.46) | Reference | | |
| | 31 – 37 Years | 26 (81.25) | 06 (18.75) | 1.36 | 0.30 – 6.20 | 0.695 |
| | 38 Years and above | 02 (25.00) | 06 (75.00) | 7.03 | 0.64 – 77.28 | 0.111 |
| Level of Education | None | 48 (62.34) | 29 (37.66) | 1.08 | 0.17 – 6.70 | 0.936 |
| | Primary | 19 (79.17) | 05 (20.83) | 0.41 | 0.12 – 1.44 | 0.165 |
| | Secondary | 34 (79.07) | 09 (20.93) | 2.58 | 0.39 – 17.41 | 0.328 |
| | Tertiary | 27 (84.38) | 05 (15.63) | Reference | | |
| Marital status | Unmarried | 90 (75.63) | 29 (24.37) | Reference | | |
| Marital status | Married | 230 (87.45) | 33 (12.55) | 1.89 | 0.40 – 8.83 | 0.421 |
| Occupation of the mother | Peasant | 32 (66.67) | 16 (33.33) | 2.99 | 0.70 – 12.72 | 0.138 |
| | Business | 55 (73.33) | 20 (26.67) | 2.03 | 0.65 – 6.37 | 0.223 |
| | Civil Servant | 70 (85.37) | 12 (14.63) | 1.72 | 0.22 – 13.55 | 0.609 |
| | Private Employee | 97 (92.38) | 08 (07.62) | 1.75 | 0.29 – 10.47 | 0.538 |
| | Self employed | 66 (91.67) | 06 (08.33) | Reference | | |
| Antepartum Hemorrhage | Yes | 117 (76.47) | 36 (23.53) | 4.75 | 1.82 – 12.40 | **0.001** |
| | No | 203 (88.65) | 26 (11.35) | Reference | | |
| Prolonged PROM | Yes | 166 (79.05) | 44 (20.95) | 5.70 | 2.00 – 16.21 | **0.001** |
| | No | 154 (89.53) | 18 (10.47) | Reference | | |
| History of producing earlier than EDD | Yes | 81 (75.70) | 26 (24.30) | Reference | | |
| | No | 239 (86.91) | 36 (13.09) | 0.65 | 0.22 – 1.97 | 0.451 |
| Number of babies delivered | Single | 258 (92.14) | 22 (07.86) | Reference | | |
| | Multiple | 62 (60.78) | 40 (39.22) | 0.94 | 0.48 – 1.83 | 0.853 |
| Diabetes Mellitus | Yes | 82 (76.64) | 25 (23.36) | 0.61 | 0.24 – 1.53 | 0.292 |
| | No | 238 (86.55) | 37 (13.45) | Reference | | |
| Hemoglobin | <10g/dl | 49 (64.47) | 27 (35.53) | 20.64 | 6.19 – 68.89 | **<0.001** |
| | ≥10g/dl | 271 (88.56) | 35 (11.44) | Reference | | |
| Hypertension | Yes | 72 (67.29) | 35 (32.71) | 7.51 | 2.72 – 20.75 | **<0.001** |
| | No | 248 (90.18) | 27 (09.82) | Reference | | |

**aOR = Adjusted odds ratio. CI= Confidence interval. P Value is Significant at 0.05 level**

## DISCUSSION

### The Prevalence of Preterm Births among Women Delivering at Lira RRH

This study revealed that the prevalence of preterm birth was 16.23% (27.27/176) with a 95% confidence interval of 12.52 – 19.94. The prevalence of preterm birth found in the present study is slightly in line with the results of a study done from Tanzanian found the prevalence of preterm delivery to be 14.2% [21]. This is similar to the 15% reported by [25] in a Medical College Hospital in India and the 16.4% reported in a study in Harare Maternity Hospital in Zimbabwe [26]. It is also similar to the 16.8% reported by [27] in Malawi that involved secondary analysis of data from community based randomized placebo-controlled trial for the prevention of preterm birth and WHO population-based estimates of preterm birth that indicate that most countries with a prevalence of more than 15% are in sub-Saharan Africa [12]. The prevalence of preterm birth in the present study was however higher than the 12% reported by [28] in the University of Ilorin Teaching Hospital, Nigeria. Though done in a tertiary care hospital similar to that of the current study, this Nigerian study excluded mothers who were unsure of dates; those who had a discrepancy of more than 2 weeks between gestation by dates and Ballard's assessment and multiple gestations and may have thus underestimated the prevalence of preterm delivery. The figure of 16.23% prevalence of preterm birth in the present study is lower than the result of an Indonesian study which revealed that 35% of preterm birth occurred at the Hasan Sadikin General

Hospital in 2015 [29]. Furthermore, the prevalence found in the present study is lower than the prevalence of 25.9% in a study done from Jimma University Specialized Teaching and Referral Hospital, Ethiopia [30]. The discrepancies in the study findings could be due to the fact that the previous studies were conducted from geographical regions which vary from where the present study was conducted. The result of the present study is not in line with the results of a study done in Tehran, Iran about the prevalence rate and risk factors for preterm delivery which revealed that the overall prevalence rate of preterm delivery was 1.52% [31]. The difference in the study findings could be because of the variation in the study participants and the difference in study designs used. The prevalence found in the present study is higher than the prevalence of 5.6% which was found in a study done from a government hospital [32]. In addition, the result of the present study is higher than the 12.2% found in Porto Alegre [33]. Also, the result of the present study is higher than the finding of a retrospective cross-sectional study by [34] who found that the prevalence of preterm birth was 6.1% [34]. The disagreement in the study findings could be due to the difference in the sampling techniques used as well as the difference in the study settings.

**The Proportions of Early and Late Preterm Births among Women Delivering at Lira Regional Referral Hospital**

This study revealed that majority of the study participants 66.13% (41/62) were late preterm at 95% CI of 54.01 – 78.25 meanwhile the remaining 33.87% (21/62) were early preterm at 95% CI of 21.75 – 45.99. The finding of the present study is in agreement with the findings of a study done in Iraq which showed that the vast majority of the infants were moderate-to-late preterm (32 up to 37 weeks) which accounted for 62.5%, while 30.5% were very preterm (28 up to 32 weeks) and those born extremely preterm (<28 weeks) accounted for 7.0% of the infants [35]. The result of the present study is not in agreement with the results of a study done in south Indian tertiary hospital setting which showed that out of the 1078 preterm births, pregnancies with Gestational age <32 weeks account for 8.53 %, 32-34 weeks account for 53.43% and >34 weeks account for 38.03% of the preterm births [8]. The discrepancy in the study results could be because the two studies were conducted in different geographical locations. The proportion of late preterm found in the present study is higher than the result of a Nigerian study which revealed that PTB was prevalent in the study population, with 790(16.8%) of the deliveries occurring preterm (<37 Weeks gestation). Of these, 218 (4.7%) were early (22-31 weeks) PTBs, 212 (4.5%) were moderate PTBs (32-34 weeks) and 360 (7.7%) were late (35-36 weeks) PTBs [36]. The discrepancy in the study findings could be because of the variation in the study participants as well as the variation in the sample sizes in the two studies. The 66.13% of late preterm found in the present study is lower compared to the results of a study done in Malawi which revealed that among women who delivered preterm, 75.2% were late preterm births (34–36 weeks) [37]. It has been assumed that infective morbidity (including infection with HIV) is largely responsible for higher rates of preterm birth in Africa compared with other regions [38]. In fact, we were unable to demonstrate any impact of HIV infection on preterm birth though. Our study was performed at a time when there was considerable stigma associated with HIV infection in the study site community much as the study was hospital based. High risks of variable metabolic aberrations in late preterm infants make them physiologically unfit to leave the maternal utero-placental unit. Mechanisms to cause such metabolic symptoms are often interrelated. For example, late preterm infants suffered from temperature instability because of relatively immature epidermal barrier, a higher body surface area to weight ratio, and increased heat loss from frequent delivery room interventions [39]. The proportion of late preterm found in the present study is higher than was found in a study conducted from a medical center of northern Taiwan with a level III NICU and around 4000 annual deliveries which showed that 18.6% of the inborn infants were born preterm, and 61.3% of the preterm infants were born between 340/7 and 366/7 weeks' gestation. Thus, of all the newborn infants delivered, more than one out of every ten (11.4%) was born late preterm [40]. Much as the present study was a cross sectional study, the previous study was retrospective study. This could be the reason for the discrepancy in the study findings. A study which involved obstetric department of all public hospitals in Portugal reported 5.4% of late preterm and 27% of early term deliveries [41]. These findings deviated from the findings the present study probably because the previous study was bigger meanwhile the present study focused on only one hospital. Addressing the global burden of preterm birth is crucial to achieving Sustainable Development Goal 3 (ensure healthy lives and promote wellbeing for all at all ages) and for reducing preterm-related neonatal and child mortality [42]. Estimates of the global burden of preterm birth are needed to understand the global epidemiology of this condition because data are sparse and incomplete in many countries.

**The Factors Associated with Preterm Births among Women Delivering at Lira Regional Referral Hospital**

After running a multivariate logistic regression, maternal age, antepartum hemorrhage, prolonged PROM, hemoglobin level and hypertension were found to be independently associated with preterm births among the study participants at Lira Regional referral hospital.

**Maternal Socio-demographic Factors**

Maternal Age; The result of the present study is in line with the results of a study done from Indonesia which revealed that maternal age has a statistically significant association with preterm birth. Pregnant patients with age <20 years were 15.86 times likely to experience preterm birth compared to the age group of 20 - 35 years [29]. Similarly, in another study conducted by [21], the chi square test showed that there was a significant association between maternal age with clinical subtypes of prematurity. The significant asociation between young maternal age and preterm delivery in this study may be explained by poor management of these group which exposes them the risk of preterm birth as clinicians don't give these women more attention. More to this is the fact that women in this age group are most likely first time mothes in addition to being young, as such they are less knowledgeable about to take care of the pregnancy. The result of the present study is in agreement with the findings from a muti-centre study done in Iran which provided evidence that in terms of age, the frequency of preterm birth in mothers under 20 was 5.83 times higher than that in mothers in the age range of 20-35 (CI = 2.99, 11.37, and P < 0.001), showing a statistically significant difference [43]. This calls for health workers to gear more attention towards mothers in the age category of below 20 years so as to curb the problem of preterm birth in that age category. Whereas the present study found an association between the lower age extreme and preterm birth, a study at Ilorin Teaching Hospital, Nigeria found an assocaiton between upper age extreme and preterm birth in whereby maternal age >35 years was significantly associated with premature birth [28]. Another study in Taiwan also found statistical association between advanced maternal age and preterm birth [44]. Previous studies have also reported that advanced maternal age is positively associated with the risk of early preterm birth [45]. When the age of a woman advances, physiologically her body detoriates and as such not very suitable to take good care of a pregnancy thereby making labor to occur earlier than the EDD.

**Obstetric Factors**

Antepartum hemorrhage; Similar to the results of the present study, the results of a prospective and registry-based study showed statistically significant differences in rates of preterm delivery with a 4-fold increase in preterm birth among the women who had antepartum hemorrhage when compared with controls [46]. Most previous studies had shown that APH was associated with preterm delivery while a few had not [47, 48, 28]. This study confirmed that the factors has significant association with preterm birth. Significant APH often leads to preterm delivery due to the risk it poses to the pregnant woman. In the current study, APH was the main cause of obstetrically indicated preterm delivery. Antepartum hemorrhage (APH) is one of the leading causes of obstetrical hemorrhage and maternal death and also a major cause of perinatal morbidity and mortality worldwide [34]. A study conducted at Medical College, Mysore, India showed that, in spite of a lot of improvement in the form of antenatal care and intrapartum surveillance, antepartum hemorrhage has not reduced. It still continues to constitute a major portion of obstetrical hemorrhage [49]. Prolonged PROM; The result of the present study is in agreement with the result of a previous study which found a significant difference in terms of preterm rupture of membranes (PROM) so that the mothers with PROM had a preterm labor frequency of 5.11 times higher (CI = 2.69, 9.69, and P < 0.001) [43]. Premature rupture of membranes (PROM) is defined as a spontaneous leakage of amniotic fluid from the amniotic sac where the baby swims; the fluid escapes through ruptured fetal membranes, occurring after 28 weeks of gestation and at least one hour before the onset of true labour. PROM can occur before or after 40 weeks' gestation, so the word 'premature' does not mean that the gestational age of the fetus is preterm. Rupture of the membranes before the onset of contractions (premature rupture of the membranes: PROM) complicates 10% of pregnancies, with 3% of pregnant women having PROM before 37 weeks' gestation. Preterm PROM (pPROM) is more likely to occur in populations of lower socioeconomic status and complicates one-quarter to one-third of preterm births [25]. Prolonged PROM continues to be common problem affecting many pregnancies and their outcome. [50] reported PPROM complicated 3% of pregnancies, approximately, 150,000 pregnancies yearly in the United States. In separate studies [51] reported that PPROM complicated 2 to 4% of all singleton pregnancies. A recent study, revealed that PPLROM complicated 2 to 20% of all births and was associated with 18 to 20% of perinatal deaths [52].

**Medical Factors**

Hemoglobin Level: The result of the present study is similar to the result of a study conducted by [29] who found that anemia had a significant relationship with

the occurrence of preterm birth as a risk factor, this was consistent with studies conducted by [53] in Korea who concluded that anemia in pregnant women contributes 1.53 times against premature birth. In pregnancy, iron deficiency has been linked to an increased risk of premature birth and low birthweight. Most previous studies have measured maternal hemoglobin during pregnancy. As the Hb concentration changes during pregnancy with fetal growth, the association between maternal Hb and adverse birth outcomes may vary depending on the gestational age at which Hb is measured [25]. Unlike in the present study which established an association between anemia and preterm birth without specifying the trimester, the results of a systematic review and meta-analysis showed that maternal anemia in the first trimester increases the risk of premature birth (relative risk, 1.65 [95% CI: 1.31–2.08]). But, this relationship was not significant in the second (relative risk, 1.45 [95% CI: 0.79–2.65]) and third trimester (relative risk, 1.43 [95% CI: 0.82–2.51]) [54]. Hypertension: The finding of the current study is in line with the findings of a study done by [55] who reported that there is a significant correlation between the incidence of preeclampsia and preterm birth. Similarly, [21] found that pregnancy induced hypertension was associated with preterm birth (OR 6.83; 95% CI: 2.921– 15.96). The result of the present study is in agreement with the results of a study done Tanzania which provided evidence that pregnancy induced hypertension was strongly associated with preterm delivery even after adjusting for the confounders. Women who had pregnancy induced hypertension/ preeclampsia were nearly seven folds more likely to have pre-term delivery as compared to normotensive women [21]. The similarity in the study finsings can be explained by the fact both studies were conducted from referal hopitals. The results of a study by [37] indicated higher frequency of gestational hypertension and preeclampsia in mothers with preterm birth. This finding is in agreement with the result of the present study. [32] found that medical disorders like hypertension that tend to last from one pregnancy to the next, might explain many repetitive spontaneous and induced preterm births. Hypertension and pre-eclampsia that increased the risk of preterm birth by 7.3 and 3.6 folds, respectively. [22] in their study conducted in Mulago fotnd that preeclampsia/eclampsia in the index pregnancy was associated with preterm birth with p-value and 0.001.

## CONCLUSION

The study found out that the preterm birth rate in Lira regional referral Hospital was 16.23%. Biological factors including maternal age, antepartum hemorrhage, prolonged PROM, hemoglobin level and hypertension were all significantly associated with preterm birth. Recognizing the most common risk factors for preterm birth will help to increase the awareness about high-risk pregnancy, improve the preventive measures of preterm risk factors and modify preterm care protocol in nurseries.

### Recommendations

Results of the present study shows that Lira Regional Referral Hospital is burdened with preterm births. It is important to put the following recommendations under consideration so has to reduce the prevalence of preterm births. Developing a deeper understanding of the factors significantly associated with preterm birth in a community with an extremely high incidence and particularly identifying those factors that are modifiable, could help develop new approaches to antenatal (and pre pregnancy) care to prevent adverse pregnancy outcome. Clinicians and other health care providers should routinely assess women at high risk of preterm delivery during prenatal care to prevent the occurrence of preterm delivery and associated adverse perinatal outcomes. Data from this study should compel future research in this field, in order to better understand the etiology of labor and mode of delivery in these gestational ages, and to better evaluate neonatal complications arising from late preterm and early term deliveries.

## REFERENCES


1. WHO (2010) The World Health Report [2010]: Health Systems Financing; the Path to Universal Coverage. W.H. Organization.
2. Muglia, L. J. & Katz, M. (2010). The Enigma of Spontaneous Preterm Birth. The New England Journal of Medicine, 362, 529-535. https://doi.org/10.1056/NEJMra0904308
3. WHO (2012) World Health Statistics 2012. www.who.int/gho/publications/world_health_statistics/2012/en/
4. Blencowe, H., Cousens, S., Oestergaard, M. Z., Chou, D., Moller, A.-B., Narwal, R., Adler, A., Garcia, C. V., Rohde, S., & Say, L. (2012). National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. *The Lancet*, *379*(9832), 2162–2172.
5. Soleimani, F., Zaheri, F., & Abdi, F. (2014). Long-term neurodevelopmental outcomes after preterm birth. Iran Red Crescent Med J., 16(6):e17965. doi: 10.5812/ircmj.17965. Epub 2014 Jun 5. PMID: 25068052; PMCID: PMC4102985.

6. Goldenberg, R., Culhane, J., Iams, J., & Romero, R. (2008). Epidemiology and Causes of Preterm Birth. Lancet. 371. 75-84. 10.1016/S0140-6736(08)60074-4.
7. Liu, X., Xu, W., Pan, Y., Du, E., Liu et al. (2015). suspect that Zhu et al. (2015) may have underestimated dissolved organic nitrogen (N) but overestimated total particulate N in wet deposition in China. Sci Total Environ., 1;520:300-1. doi: 10.1016/j.scitotenv.2015.03.004. Epub 2015 Mar 8. PMID: 25759249.
8. Philip, T., & Thomas, P. (2018). *Original Research Article A prospective study on neonatal outcome of preterm births and associated factors in a South Indian tertiary hospital setting*. *7*(12), 4827–4832.
9. Figueiredo, V., Bayer, S., & Junior, I. F. (2022). Infant Mortality in a Brazilian Municipality with a High Human Development Index. Turk Arch Pediatr., 57(6):630-636. doi: 10.5152/TurkArchPediatr.2022.22146. PMID: 36124358; PMCID: PMC9682785.
10. Damiani, J., Freitas, M., Tedesco, C., Gomes, C., Celso, F., Lessa, B., Silva, I., Garcia, D., Celiny, P., Garcia, R., Scheeren, M., Fiori, H. H., Cohorts, P., & Group, S. (2018). *Prevalence , mortality and risk factors associated with very low birth weight preterm infants : an analysis of. xx*, 1–6. https://doi.org/10.1016/j.jped.2018.10.011.
11. Bapat, S., Myles, P., Fogarty, A., & Tata, L. (2019). Factors associated with preterm delivery and low birth weight : a study from rural Maharashtra , India [ version 1 ; peer review : 2 approved ] Anand Ahankari. May, 1–12.
12. Blencowe, H., Cousens, S., Oestergaard, M. Z., Chou, D., Moller, A. B., Narwal, R., Adler, A., Vera, G. C., Rohde, S., Say, L., & Lawn, J. E. (2012). National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. Lancet, 379(9832):2162-72. doi: 10.1016/S0140-6736(12)60820-4. PMID: 22682464.
13. Petrou, S., Eddama, O., Mangham-Jefferies, L. (2011). A structured review of the recent literature on the economic consequences of preterm birth. Archives of disease in childhood. Fetal and neonatal edition. 96. F225-32. 10.1136/adc.2009.161117.
14. State, O. R. (2017). Journal of Women ' s Health Care Prevalence of Preterm Birth and its Associated Factors among Mothers Delivered in Jimma University Specialized Teaching and Referral Hospital, Jimma Zone, *6*(1), 1–10. https://doi.org/10.4172/2167-0420.1000356.
15. UBOS (2012) Uganda Bureau of Statistics, Statistical Abstract. www.ubos.org
16. Beck, S. J., Hanson, C. A., Puffenberger, S. S., Benninger, K. L., & Benninger, W. B. (2010). A controlled trial of working memory training for children and adolescents with ADHD. J Clin Child Adolesc Psychol., 39(6):825-36. doi: 10.1080/15374416.2010.517162. PMID: 21058129.
17. Rao, C. R., Bhat, P., Ke, V., Kamath, V., Kamath, A., Nayak, D., Shenoy, R. P., & Bhat, S. K. (2018). Assessment of risk factors and predictors for spontaneous pre-term birth in a South Indian antenatal cohort. *Clinical Epidemiology and Global Health*, *6*(1), 10–16. https://doi.org/10.1016/j.cegh.2017.07.001.
18. Thomas, M., Philip, F.A., Mathew, A.P., & Jagathnath, K.M. (2018). Intraoperative Pectoral Nerve Block (Pec) for Breast Cancer Surgery: A Randomized Controlled Trial. Journal of Anaesthesiology Clinical Pharmacology, 34, 318-323.
19. Silva, A. M., Almeida, M. F., Matsuo, T., & Soares, D. A. (2009). Risk factors for pre-term birth in Londrina, Paraná State, Brazil. *Cad Saude Publica*., 25:2125–38. doi: 10.1590/s0102-311x2009001000004
20. Ugwu, C. N., & Eze, V. H. U. (2023). Qualitative Research. IDOSR Journal of Computer and Applied Sciences 8(1) 20-35. https://www.idosr.org/wp-content/uploads/2023/01/IDOSR-JCAS-8120-35-2023.docx.pdf
21. Temu, T. B., Masenga, G., Obure, J., Mosha, D., & Mahande, M. J. (2016). Asian Paci fi c Journal of Reproduction. *Asian Pacific Journal of Reproduction*, *5*(5), 365–370. https://doi.org/10.1016/j.apjr.2016.07.009.
22. Ayebare, E., Ntuyo, P., Malande, O. O., & Nalwadda, G. (2018). Maternal, reproductive and obstetric factors associated with preterm births in Mulago Hospital, Kampala, Uganda: a case control study. Pan Afr Med J., 30:272. doi: 10.11604/pamj.2018.30.272.13531. PMID: 30637057; PMCID: PMC6317463.
23. Val Hyginus, U. E., Chinyere, N. U., & Ifeanyi, C. U. (2023). A Study of Cyber Security Threats, Challenges in Different Fields and its Prospective Solutions: A Review. INOSR Scientific Research 9(1):13-24. http://www.inosr.net/wp-content/uploads/2023/02/INOSR-SR-9113-24-2023..pdf

24. Ugwu, C. N., Eze Val, H. U., Ugwu, J. N., Ogenyi, F. C., & Ugwu, O. P. C. (2023). Ethical Publication Issues in the Collection and Analysis of Research Data. Newport International Journal of Scientific and Experimental Sciences (NIJSES),*3*(2):132-140. https://nijournals.org/wp-content/uploads/2023/07/NIJSES-32-132-140-2023.pdf
25. Shubhada, S. A., Kambale, S. V, & Phalke, B. D. (2013). Determinants of preterm labour in a rural medical college hospital in western Maharashtra. *Nepal Journal of Obstetrics and Gynaecology*, *8*(1), 31–33.
26. Flores-Sanchez, L., Paredes-Solis, S., Balanzar-Martinez, A., Flores-Moreno, M., Legorreta-Soberanis, J., & Andersson, N. (2014). [Hepatitis B vaccination coverage and associated factor for vaccine acceptance: a cross-sectional study in health workers of the Acapulco General Hospital, Mexico]. *Gaceta Medica de Mexico*, *150*, 395–402.
27. van den Broek, N. R., Jean-Baptiste, R., & Neilson, J. P. (2014). Factors associated with preterm, early preterm and late preterm birth in Malawi. *PloS One*, *9*(3), e90128.
28. Olugbenga, A., Mokuolu, B., Suleiman, O., Adesiyun, A., & Adeniyi, B. (2010). Prevalence and determinants of pre-term deliveries in the University of Ilorin Teaching Hospital, Ilorin, Nigeria. *Pediatric Report*, *2*(3), 11–13.
29. Hidayat, Z. Z., Ajiz, E. A., & Krisnadi, S. R. (2016). *Risk Factors Associated with Preterm Birth at Hasan Sadikin General Hospital in 2015*. 798–806. https://doi.org/10.4236/ojog.2016.613098.
30. Bekele, I., Demeke, T., & Dugna, K. (2017). Prevalence of Preterm Birth and Its Associated Factors among Mothers Delivered in Jimma University Specialized Teaching and Referral Hospital, Jimma Zone, Oromia Regional State, South West Ethiopia. Women's Health Care Journal, 6, 356.
31. Tehranian, N., Ranjbar, M., & Shobeiri, F. (2015). The Prevalence Rate and Risk Factors for Preterm Delivery in. *5*, 1–5.
32. Soundarajan, P., Muthuramu, P., Veerapandi, M., & Mariappan, R. (2016). Retrospective study factors related to preterm birth in Government Raja Mirasudar hospital and obstetric and perinatal outcome. *5*(9), 3006–3010.
33. Oliveira, L. L. De, Lucia, A., & Bonilha, D. L. (2016). *Maternal and neonatal factors related to prematurity *. 50*(3), 382–389.
34. Bapat, R., Gulati, I. K., & Jadcherla, S. (2019). Impact of SIMPLE feeding quality improvement strategies on Aerodigestive milestones and feeding outcomes in BPD infants. *Hosp Pediatr.*, **9**(11):859–866.
35. Fadhil, S., Al, F., & Alwan, F. W. (2018). Sociodemographic and Medical Factors of Preterm Delivery According to the Clinical Subtypes of Prematurity. https://doi.org/10.4103/MJBL.MJBL.
36. Butali, A., Ezeaka, C., Ekhaguere, O., Weathers, N., Ladd, J., Fajolu, I., Esezobor, C., Abiodun, M., Badejoko, B., & Ryckman, K. (2016). *Open Access. 8688*, 1–8. https://doi.org/10.11604/pamj.2016.24.1.8382.
37. Broek, N. R. Van Den, Jean-baptiste, R., & Neilson, J. P. (2014). Factors Associated with Preterm , Early Preterm and Late Preterm Birth in Malawi. *PLOS ONE*, *9*(3). https://doi.org/10.1371/journal.pone.0090128.
38. Heng, Y. J., Liong, S., Permezel, M., Rice, G. E., Di Quinzio, M. K. W., & Georgiou, H. M. (2015). Human cervicovaginal fluid biomarkers to predict term and preterm labor. *Frontiers in Physiology*, *6*, 151.
39. Laptook, A., & Jackson, G. L. (2016). Cold stress and hypoglycemia in the late preterm ("near-term") infant: impact on nursery of admission. *Seminars in Perinatology*, *30*(1), 24–27.
40. Tsai, M.-L., Lien, R., Chiang, M.-C., Hsu, J.-F., Fu, R.-H., Chu, S.-M., Yang, C.-Y., & Yang, P.-H. (2012). Prevalence and morbidity of late preterm infants: current status in a medical center of Northern Taiwan. *Pediatrics & Neonatology*, *53*(3), 171–177.
41. Barros, J. G., Clode, N., & Graça, L. M. (2016). Prevalence of Late Preterm and Early Term Birth in Portugal. *Acta Médica Portuguesa*, *29*(4), 249. https://doi.org/10.20344/amp.6523
42. Chawanpaiboon, S., Vogel, J. P., Moller, A.-B., Lumbiganon, P., Petzold, M., Hogan, D., Landoulsi, S., Jampathong, N., Kongwattanakul, K., & Laopaiboon, M. (2019). Global, regional, and national estimates of levels of preterm birth in 2014: a systematic review and modelling analysis. *The Lancet Global Health*, *7*(1), e37–e46.
43. Bakhteyar, K., Lorzadeh, N., Pournia, Y., Birjandi, M., & Ebrahimzadeh, F. (2012). *Factors associated with preterm delivery in women admitted to hospitals in Khorramabad : A case control study. 1*(3), 147–152. https://doi.org/10.4103/2278-344X.105064.
44. Chang, Y.-K., Tseng, Y.-T., & Chen, K.-T. (2020). The epidemiologic characteristics and associated risk factors of preterm birth from 2004 to 2013 in Taiwan. *BMC Pregnancy and*

*Childbirth*, *20*, 1–7.

45. Bayrampour, H., Heaman, M., Duncan, K. A., & Tough, S. (2012). Comparison of perception of pregnancy risk of nulliparous women of advanced maternal age and younger age. *Journal of Midwifery & Women's Health*, *57*(5), 445–453.
46. McNamara, K., Khashan, A., & Burke, C. (2011). Antepartum haemorrhage and adverse pregnancy outcomes–a prospective and registry based study. *Archives of Disease in Childhood-Fetal and Neonatal Edition*, *96*(Suppl 1), Fa127–Fa128.
47. Feresu, S. A., Harlow, S. D., Welch, K., & Gillespie, B. W. (2014). Incidence of and socio-demographic risk factors for stillbirth, preterm birth and low birthweight among. Zimbabwean women. *Paediatric and Perinatal Epidemiology*, *18*(2), 154–163.
48. Khalajinia, Z., & Gholamreza, J. (2012). Maternal risk factors associated with preterm delivery in Qom province of Iran in 2008. *Scientific Research and Essays*, *7*(1), 51–54.
49. Bekem Dibaba, D. E., Hajure, M., & Gebre, G. (2021). Risk Factors of Antepartum Hemorrhage Among Mothers Who Gave Birth at Suhul General Hospital, 2016: A Case–Control Study. *Journal of Multidisciplinary Healthcare*, *14*, 271.
50. Van Der Heyden, J. L., Van Der Ham, D. P., Van Kuijk, S., Notten, K. J. B., Janssen, T., Nijhuis, J. G., Willekes, C., Porath, M., Van Der Post, J. A., & Halbertsma, F. (2013). Outcome of pregnancies with preterm prelabor rupture of membranes before 27 weeks' gestation: a retrospective cohort study. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, *170*(1), 125–130.
51. Mercer, B. (2011) Premature Rupture of the Membranes. Clinical Obstetrics and Gynecology, 54, 305-306. https://doi.org/10.1097/GRF.0b013e31821ac75d
52. Aziz, N., Cheng, Y. W., & Caughey, A. B. (2018). Factors and outcomes associated with longer latency in preterm premature rupture of membranes. *The Journal of Maternal-Fetal & Neonatal Medicine*, *21*(11), 821–825.
53. Yi, S. W., Han, Y. J., & Ohrr, H. (2013). Anemia before pregnancy and risk of preterm birth, low birth weight and small-for-gestational-age birth in Korean women. Eu J Clin Nutr., 67(4):337-42.
54. Rahmati, S., Azami, M., Badfar, G., Parizad, N., & Sayehmiri, K. (2020). The relationship between maternal anemia during pregnancy with preterm birth: a systematic review and meta-analysis. *The Journal of Maternal-Fetal & Neonatal Medicine*, *33*(15), 2679–2689.
55. Xiong, W., Cui, T., Cheng, K., Yang, F., Chen, S. R., Willenbring, D., Guan, Y., Pan, H. L., Ren, K., Xu, Y., & Zhang, L. (2012). Cannabinoids suppress inflammatory and neuropathic pain by targeting α3 glycine receptors. J Exp Med., 209(6):1121-34. doi: 10.1084/jem.20120242.

**CITE AS: Omach Joshua (2024). Prevalence and risk factors of Preterm Births in Northern Uganda: A Hospital-Based Study at Lira Regional Referral Hospital. IDOSR JOURNAL OF EXPERIMENTAL SCIENCES 10(3) 39-62. https://doi.org/10.59298/IDOSR/JES/103.39.62**