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Prevalence and Risk Factors Associated with Preterm Birth at Irene-Neto Lubango Provincial Maternity- Huila /Angola

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

According to WHO (2018), almost 15 million babies are born every year before 37 weeks of pregnancy, the majority taking place in Sub Saharan Africa and in south Asia. Preterm birth is a common complication of pregnancy and usually bore heavy short- and long-term medical, socio-economic and financial burden to the affected children, the family, the heath system and the community as all. Angola with one of the highest fertility rates in the world, 6.2 according to the DHS 2015-2016, coupled with the fact that preterm birth is regarded as a traumatic social even for the parent and a quite expensive condition to the health system will need to stablish the main risk factors for preterm birth in order to inform strategies to prevent its occurrence.

We conducted an hospital based cross sectional study to determine the prevalence and the risk factors of preterm birth at Irene Neto Maternity Hospital- Lubango-Angola.

Three trained research assistants were recruited from the post labour wards and the new born unit and trained to collect data. Gestational age was calculated using a standard obstetric wheel based on menstrual dates or first trimester ultrasound (when available). A Newborn clinical assessment using the Finnstrom Score aided by a printed pictorial scoring chart was then conducted within 24 hours of birth, by a trained medical Doctor for confirmation.

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17.7% of women giving birth at Lubango maternity hospital had a preterm new-born.
Among the socio- demographics factors, only maternal age (p :0.021), family income(p:0.032), use of alcohol (p: 0.013) and lack ANC (p: <0.001) were associated with premature birth. Clinical factors found to increase the risk of premature birth included Antecedent of hypertension (p: 0.021), Preeclampsia (p: 0.026), Malaria (p:0.001) and multiple gestation (p: 0.01).
Only antecedent of premature birth (p:0.0049), lack of antenatal care (p<0.001), malaria (p:0.009) and multiple gestation (p: 0.001) remained significant after controlling for confounders.
Premature birth is still a public health problem in Angola, principally among pregnant women who do not attend ANC clinic and those with multiple gestation. Malaria infection during pregnancy as well as preeclampsia are also serious predictors of premature birth.
With a prevalence of 17.7%, premature birth is a still a serious problem at lubangopediatric hospital and deserve a multisectoral well-coordinated action.
ANC clinic should be actively promoted, improved and expended.
Pregnant women with antecedent of premature birth should be closely monitored
Preeclampsia and malaria should be prevented, searched and serious treated when present during pregnancy.
We the recommend a Multicentre and large sample size, longitudinal observational analytic study for better understanding of the principal predictors at a country level.

Keywords: Preterm birth; neonatal mortality; maternity; child health.

1. INTRODUCTION

Preterm birth is a common complication of pregnancy and usually bore heavy short- and long-term medical, socio-economic and financial burden to the affected children, the family, the heath system and the community as all.

Preterm birth is still the leading cause of neonatal morbidity and mortality. Premature birth is one of the most common causes of maternal and child health and social problems both in developed and developing countries [1]. Prematurity accounts for almost 35 percent of all neonatal death worldwide and is an important cause of death among children before they reach five years of age [2].

To achieve the sustainable development Goal (SDG) target to reduce neonatal mortality to less than 12/1000 live birth by 2030, most low- and middle-income countries need to improve the quality of care for new-born, principally for the preterm and sick new-born. Most important is the need to increase access to interventions directed to the mother before as well as improving care during pregnancy, before and during birth.

The cause of preterm birth are very complex and usually different from country to country and even across region. According to a study in Gaza by Abu Hamad et al (2007), preterm birth was significantly associated with advanced maternal age, inadequate ante natal care, failure to gain weight during pregnancy and previous preterm birth ,while Elizabeth A et al (2018) found a strong association between preterm birth and living in rural area in Uganda [3,4].

Although the risk factors for preterm birth have been studied in other part of the world, principally in western countries, there is still scarce data in Angola and in most of African countries with similar socio-demographic and clinical characteristics.

In Angola, despite the probable high rate of preterm birth and its significant contribution to neonatal and under five deaths, the prevalence of premature birth and it associated risk factors have not been well studied. There is then a need to establish the rate of preterm birth and it contributing factors for recommendations and interventions where possible in order to mitigate it effect in new-borns and mother's lifes. Angola with one of the highest fertility rate in the world, 6.2 children/each woman in reproductive age, according to the DHS 2015-2016 [5], coupled with the fact that preterm birth is regarded as a traumatic social even for the parent and a quite expensive condition to the health system . it then make all sense trying to stablish the main risk factors for preterm birth in order to inform strategies to prevent it occurrence. The findings from this study will go a long way in formulation of recommendation for interventions and strategies in Angola's health sector. This will be very instrumental in the planning and allocation of appropriate resources in the health care delivery.

Overall objective:To determine the prevalence and the risk factors of preterm birth at Irene Neto Maternity Hospital Lubango-Angola

Specific objective

1. To determine the prevalence of preterm birth at Irene Neto Provincial Maternity Hospital Lubango-Angola
2. To determine the socio-demographic characteristic associated with preterm birth at Irene Neto Maternity Hospital Lubango-Angola
3. To determine the clinical characteristic associated with preterm birth at Irene Neto Maternity Hospital Lubango-Angola

2. MATRIALS AND METHODS

Study site: Irene Neto Lubango Provincial Maternity Hospital- Angola.

Study design: Cross sectional

Study period: December 2020- February 2021

Inclusion criteria:

- All women admitted in the post-partum recovery room who gave consent to participate in the study

Exclusion criteria

- Clinically unstable women in the post-partum ward
- Women admitted in the Intensive Care Unit (ICU) at Lubango Maternity hospital after giving birth to live child.
- Mothers who were unsure of the dates and with no primary semester echography
- Women admitted at post-partum recovery at Lubango Maternity hospital hospitalwho declined to give an informed consent.

Sample size determination: The Fishers formula was used to determine the minimum sample size as shown:

$$n= [Z\alpha/2\ p(1-p)/d^2]=384$$

Where, n is the required minimum sample size,
Zα/2 is a standard score corresponding to 95% CI thus equal to 1.96,
p = 50%Prevalence of risk factors among women in the post labour ward since no study has been done.
d is the margin of error and was taken to be 5% (0.05).
1.96x1.96x1-0.5x0.5=384

Sampling method: All subjects who fulfilled the inclusion criteria were selected one after the other in a systematic sampling basis. The recruited subjects were assessed clinically, and questionnaires was administered to them until a sample size of 412 subjects (which is above the minimal sample size calculated) were attained followed by the clinical examination of their new-born.

Estimation of preterm birth: Gestational age was calculated using a standard obstetric wheel, based on menstrual dates or first trimester ultrasound (when available) and a clinical assessment using the Finnstrom Score was conducted by a trained medical doctor aided by a printed pictorial scoring chart within 24 hours for confirmation.

Data management and analysis: Data entry template was created using SPSS version 23. Data was checked for completeness and corrected at source. Data entry was done in duplicate for validation (double entry), range checked after cross-checked for entry error. The data was cleaned and validated before analysis. The characteristics of the women were described using means and medians for continuous variables.

Data Analysis was done using SPSS version 23. To ensure confidentiality all personal identifiers were left out of the data set.

Variables: The dependent variable was premature birth, where there were those who gave birth to preterm baby and those who gave birth to term baby.

Continuous variables that had normal distribution (care takers age, height, weight…) were categorized based on the mean into different categories while skewed variables (number of children, intervals between birth…) were categorized based on the median.

Descriptive analysis: Descriptive results were reported, and missing data quantified. Proportions are reported for categorical data while mean and standard deviation are reported for a normally distributed data while median have been reported for skewed data.

Bivariate and multivariate analysis: The association between dependent variable (premature birth or not) with each of the mother socio-demographic and clinical characteristic was explored using a chi square. Where violations of a chi square test were observed e.g. the expected numbers of observations per cell were less than 5 a fisher's exact test was used. Further, a bivariate analysis between the outcome and the caretaker characteristics were carried out to test for the magnitude of association using an independent sample T test and a cross tabulation.

A multiple logistic regression analysis to identify predictor factors associated with prematurity was undertaken as final step.

For the logistic regression analysis, an odds ratio and corresponding 95% confidence intervals and Wald test p values are reported.

3. RESULTS

The majority of the mothers were between 25 and 35 years of age 166 (40.3%), single 157 (38.2%), Public workers 156 (37.9%), had no antecedent of premature birth 382(82.7%) and do not use alcohol 359 (87.1%). while 373 (90.5%) had at least one ANC during this last pregnancy and those with a family income of more than 200 USD were only 23(5.6%) Table 1.

Between December 2020 and February 202, a total of 412 participants (caregiver-child pair) were recruited into the study, a questionnaire was offered to the mother and a clinical examination to the child. The age of the participant vary between 15 years and 50 years with a mean of 25.5 years while the number of gestation the mother had have varies between 1 to 13 (medium of 3) and the interval between gestations varies from 1 year to 13 years with medium of 3 years and the time in nursery after birth varies between 0 and 30 days with a mean of 1.03 and a medium of 0 Table 2.

The majority of participant reported having no Diabetes 404 (98.1%), no HIV 406 (98.5%) , no malaria 441 (82.8%) and no Preeclampsia 374 (90.8%) Table 3.

3.1 Prevalence of Prematurity

A total of 412 caregiver-child pairs consented to participating in the study, of these, 73 (17.7%) had a premature birth while 339 (82.3) gave birth to a term new-born Table 4.

Table 1. Socio demographic characteristics

Characteristics	Number (N)	Percentage (%)
Age :		
15 – 19	86	20.9
20- 24	123	29.9
25- 35	166	40.3
More than 35	37	9
Marital status (412)		
Married	99	24.0
Single	157	38.1
Live together	156	37.9
Occupation		
Unemployed	74	18
Student	118	28.6
Public worker	156	37.9
Self employed	34	8.3
Private worker	21	5.1
Other	9	2.2
Antecedent of premature birth		
Yes	30	7.3
No	382	82.7
Family income		
Less than 50 USD	191	46.4
50-100	102	25.8
100-150	38	9.2
151-200	58	14.1
More than 200	23	5.6

Characteristics	Number (N)	Percentage (%)
Use Alcohol		
Yes	56	12.9
No	359	87.1
Use Tabaco		
Yes	8	1.9
No	404	98.1
ANC		
Yes	373	90.5
No	39	9.5

Table 2. Anthropometric and clinical characteristics

Characteristics	Minimum	Maximum	Mean (sd)	Medium
Age (in month)	15	50	25.5 (6.54)	24
Weight (in kg)	40	115	63.7 (10.42)	63
Height (in cm)	140	180	162.5 (6.80)	162
Number of gestations	1	13		3
Interval between gestation	1	12		3
Time in nursery	0	30		0
Haemoglobin	10	15		12

Table 3. Clinical characteristics of the participants

Characteristics	Number (N)	Percentage (%
Diabetes		
Yes	8	1.9
No	404	98.1
Drepanocytes		
Yes	3	0.7
No	409	99.7
Cardio vasc		
Yes	8	1.9
No	404	98.1
HIV		
Yes	6	1.5
No	406	98.5
Pre-Eclampsia		
Yes	38	9.2
No	374	90.8
Uro-genital infection		
Yes	73	17.7
No	339	82.3
Malaria		
Yes	71	17.2
No	341	82.8
Syphilis		
Yes	2	0.5
No	410	99.5
High blood pressure		
Yes	7	1.7
No	405	98.3
Gemelity		
Yes	12	2.9
No	400	97.1
Number of gestation		
0-3	291	70.6
4-6	91	22.1
More than 6	30	7.3

Table 4. Prevalence of prematurity

Prematurity	Frequency	Percentage	Valid Percentage
Yes	73	17.7	17.7
No	339	82.3	82.3

Table 5. Bivariate analysis for Socio-demographics risk factors associated with prematurity

Factor	Prematurity			
	Yes [n =73**] (**17.7**%)**	**No [n =**339**] (**82.3**%)**	**Chi square statistic**	**p'9 value**
Age :				
15 – 19	26 (6.3%)	60 (14.5%)		
20- 24	17(4.1%)	106 (25.7%)	5.300	**0.021**
25- 35	23 (5.58%)	143 (34.7%)		
More than 35	7 (1.69%)	30 (7.2%)		
Marital status				
Married	13 (3.1%)	86 (20.8%)	3.989	0.136
Single	35 (8.49%)	122 (29.6%)		
live together	25 (6.06%)	131 (31.7%)		
Occupation				
unemployed	16 (3.8%)	58 (14.07%)	7.520	0.185
student	24 (5.8%)	94 (22.8%)		
public worker	28 (6.7%)	128 (31.06%)		
self employed	1 (0.2%)	33 (8%)		
private worker	2 (0.48%)	19 (4.6%)		
others	2 (0.48%))	7 (1.6%)		
Family income				
less than 50	45 (10.9%)	146 (35.4%)		
50 - 100	9 (2.1%)	93 (22.5%)	10.559	**0.032**
101-150	5 (1.2%)	33 (8%)		
150-200	10 (2.4%)	48 (11.6%)		
more then 200	4 (0.9%)	19 (4.t6%)		
Use alcohol				
Yes	17 (4.1%)	39 (9.4%)	7.101	**0.013**
No	56 (13.5%)	300 (72.8%)		
Use Tabaco				
Yes	3 (0.7%)	5 (1.2%)	2.190	0.153
No	70 (16.9%)	334 (81.0%)		
ANC				
Yes	39 (9.4%)	334 (81.06%)		
No	34 (8.2%)	5 (1,21%)	142.563	<**0.001**
If ANC, how many				
1	8 (1.9%)	39 (9.46%)		
2	11(2.66%)	56 (13.59%)	4.537	0.338
3	9(2.1%)	68 (16.5%)		
4	7 (1,6%)	81(19.6%)		
More than 4	9 ((2.1%))	89 (21.6%)		
Sex of the new-born				
Male	33 (8.00%)	184 (44.6%)	1.983	0.196
Female	40 (9.7%)	155 (37.6%)		
Number of gestation				
0-3	50 (12.1%)	241 (58.4%)		
4-6	15 (3.6%)	76 (18.4%)	1.800	0.407
More than 6	8 (1.9%)	22 (5.3%)		

Among the socio-demographic factors analysed, family income (p: 0.032), age of the mother (p: 0.021) and use of alcohol (p:0.013) were significantly associated with prematurity. There was as well, an association between prematurity and the use of at least one ANC (p<**0.001**)Table 5.

Among the clinical factors analysed, Antecedent of premature birth (p:0.002), Antecedent of

Hypertension (p: 0.021), Preeclampsia (p: 0.026), malaria (p: 0.001), and multiple gestation (p: 0.01) were risk factors for prematurity, while was slightly associated to prematurity. At the same time Urogenital infection (p: 0.061) was found to increase the risk of premature birth Table 6.

After successful iterations at the multivariate modelling, the significant predictors for premature birth at Lubango Maternity hospital were malaria (p: 0.009), Lack of ANC (p: 0.000) and Multiple gestations (p: 0.001).

There Was as well a statistically significant association between antecedent of premature birth and a current prematurity (p: **0.0049**) after accounting for cofounders.

4. DISCUSSION

Angola as many African countries lack reliable data on new-born health and to the best of our knowledge, this is the first study conducted in Angola on a large number of independent variables as risk factors concerning premature birth. It then adds to the body of evidence from studies conducted at other hospitals around the World.

This study aimed to determine the prevalence of preterm birth and associated risk factors at Lubango Maternity Hospital in Angola. Consent was sought and obtained from the participants, after receiving an ethical clearance from the Hospital Ethical committee.

This hospital-based study finds a prevalence of premature birth to be around17.7 %, meaning that premature birth is still a significant problem in the country. This finding is similar to a study in Nigeria by Mokualo et al [6] with an estimated prevalence of premature birth between 15- 23% and a similar in a tertiary hospital in Malawi [7]. But our prevalence is slightly higher than the 9.5-15.8% prevalence reported by World Health Organization (WHO) for Sub-Saharan Africa [8]. This may be explained by the fact that Lubango Maternity Hospital being a secondary referral hospital and the largest referral maternity centre in the province and the region, could present bias for receiving complicated pregnancies that may lead to preterm deliveries. It is likely that our approach overestimated the prevalence of premature birth as in this study we relied wholly on the date of last menstruation as recall by the participants when they lack a first trimester echograpy and the Finnstrom Score, excluding mothers who were unsure of the dates and with no primary semester echography.

Table 6. Bivariate logistic regression for clinical risk factors associated with prematurity

Factor	Prematurity			
	Yes [n =73**] (**17.7**%)**	**No [n =**339 **(**82.3**%)**	**Chi square statistic**	**P value**
Antecedent of premature birth				
Yes	12 (2.9%)	18 (4.3%)		
No	61 (14.8%)	321 (77.9%)	11.018	**0.002**
Diabetes				
Yes	3 (0.7%)	5 (1.2%)	2.190	0.153
No	70 (16.9%)	334 (81.0%)		
High blood pressure				
Yes	4 (0.9%)	3 (0.7%)		
No	69 (16.7%)	336 (81.5%)	7.592	**0.021**
Cardiac disease				
Yes	2 (0.4%)	6 (1.45%)		
No	71 (17.2%)	333 (80.8%)	0.297	0.636
Drepanocytes				
Yes	2 (0.4%)	1 (0.2%)		
No	71 (17.2%)	338 (82.03%)	4.966	0.082
HIV				
Yes	3 (0.7%)	3 (0.7%)		
No	70 (16.9%)	336 (81.5%)	4.352	0.071
Preeclampsia				
Yes	12 (2.9%)	26(6.3%)	5.516	**0.026**
No	61 (14.8%)	313 (75.9_%)		
Uro-genital Infection				
Yes	19 (4.6%)	54(13.1%)	4.201	**0.061**
No	54 (13.1%)	285 (69.1%)		

Factor	Prematurity			
	Yes [n =73**] (**17.7**%)**	**No [n =**339 **(**82.3**%)**	**Chi square statistic**	**P value**
Malaria				
Yes	23 (5.0%)	48 (11.6%)	12.673	**0.001**
No	50 (12.1%)	291 (70.6%)		
Syphilis				
Yes	1 (0.24%)	1 (0.24%)	1.437	0.323
No	72 (17.4%)	338 (82.03%)		
Sex of the new-born				
Male	33 (8.0%)	184 (44.6%)	1.983	0.196
Female	40 (9.7%)	155 (37.6%)		
Multiple gestation				
Yes	6 (1.45%)	6 (1,45%)	8.835	**0.010**
No	67 (16.2%)	333 (80.8%)		

Table 7. Multivariate Analyse

Characteristic	OR (95% CI)	P value
Antecedent of premature birth	1.00	
Yes	2.859 (1.003-8.151)	
No		**0.0049**
Malaria		
Yes	1.00	
No	2.709 (1.279-5.737)	**0.009**
Preeclampsia	1.00	
Yes	1.548 (0.555-4.318)	0.404
No		
ANC	1.00	
Yes	0.018(0.006-0.042)	
No		**< 0.001**
High blood pressure	1.00	
Yes	2.470(0.229-26.633)	0.446
No		
Use alcohol	1.00	0.434
Yes	1.429(0.584-3.493)	
No		
Family income	1.00	
less than 50	0.892(0.690-1.152)	0.381
50 - 100		
101-150		
150-200		
more then 200		
Multiple gestation	1.00	
Yes	9.755(2.501-38.050)	**0.001**
No		
Age	1.00	0.062
15 – 19	1.401(0.983-1.999)	
20- 24		
25- 35		
More than 35		

Among the socio- demographics factors, only maternal age (p:0.021), family income(p:0.032), use of alcohol (p: 0.013) and ANC (p:**< 0.001**) were associated with premature birth. Clinical factors found to be associated with premature birth included Antecedent of hypertension (p: 0.021), Preeclampsia (p: 0.026), Malaria(p:0.001) and multiple gestation (p: 0.01).

Only antecedent of premature birth (p:**0.0049**), lack of antenatal care (p:**< 0.001**), malaria (p:**0.009**) and multiple gestation (p: **0.001**) remained significant after controlling for confounders.

In the current study, there was stalactitical significant association between monthly family income and premature birth (p: **0.032**), Similar to the finding by KS Joseph on the effect of socio-economic position and clinical risk factors on preterm birth [9]. This association has been very

inconsistent and variable from one study to another even when the definition of socio-economic position is based on different parameters such as income, occupation or education and the association may suffer a temporal change as well. In the current study, use of alcohol has been found to be a risk factor for premature birth (P: 0.013). These results are different from the finding of a study in Danemark by Louise Weile et al who demonstrated no evidence of association between Mother's alcohol binge drinking in early pregnancy and premature birth [10], which may probably due to the fact that they focused only in binge as opposed to any kind of alcohol consumption used in our study. But results similar to ours have been demonstrated by C M O'Leary, et all in multivariate analyse in the Western part of Australia [11]. It has been shown that women are more sensitive to the effect of alcohol, and it may easily cross the placenta and affect foetus development and has been link to miscarriage, bleeding as well as to premature birth.

This study confirms the findings by Florent F et al in Canada who demonstrated in a bivariate and multivariate analyse, a strong association between advanced maternal age and the risk of premature birth [12].

Lack of antenatal care was significantly associated with premature birth both in a bivariate analyse and after removal of cofounders in a multivariate model. A similar finding was demonstrated in a study in Beijing and another study by Fereso, A in Zimbabwe who found an increased risk of preterm birth in women who lack attendance of antenatal care [13,14]. Interventions during antenatal care such as Centering Pregnancy and other health education interventions were shown to reduce preterm birth rates by 47 percent in a low income setting in Kenya [15]. These intervention as well as other very important interventions done During antenatal consultation such as malaria testing and prevention drugs, HIV counselling and testing, infection detection and treatment, iron and folic acid supply…. Have a very strong protective effect for prematurity and mother and new-born morbi-mortality worldwide.

The current study finds an increased risk of premature birth in women who suffered an Urogenital infection during pregnancy as it was reported in a study by Muglia and Kartz in Iran in which UTI in pregnancy was associated with premature birth [16]. The mechanical compression of a pregnant uterus causes stasis of urine, making a proper environment for bacterial colonisation. As others limited or general inflammatory processes, Uro-genital infection should stimulate the production of a large quantity of cytokines which may induce preterm labour through release of prostaglandins and other substances known to stim ulate labor.

Preeclampsia was a significant risk factor for premature birth in our bivariate (p: **0.026**). This finding confirms the result from a study by Davies et al who reported in 2016 in a case control study a more than four-fold increase in the risk of prematurity in women who presented with pre-eclampsia and Carter M, who found a strong positive association between pre-eclampsia and prematurity [17,18].

Preeclamsia occur only in association to pregnancy and is diagnosed after 20 weeks of gestation. It is a serious pathology which not only increase the risk of spontaneous preterm delivery but it may as well be an indication for an iatrogenic preterm birth.

This study finds a significant association between premature birth and multiple gestation in a bivariate as well as in our multivariate analysis. Such findings have been reported by JEtuk and others [19]. Multiple gestation is associated with uterine overdistension and this may result in spontaneous preterm labour. Apart from that, a number of pregnancy related complications such as pre-eclampsia and polyhydramnios are frequently associated with multiple gestations and likely to contribute to iatrogenic preterm birth.

We find an association between malaria infection and premature birth in a bivariate analyse and after accounting for cofounders. Similar findings have been demonstrated in a systematic review by Blencow,H atel in 2019 and another one in a study in Brazil by Jamille .D et al which showed an almost two time risk of premature birth in pregnant women infected with Plasmodium falciparum [20,21]. As stated by the WHO report 2020, malaria continue to infect for than 25 million pregnant women every year, making it one of the major public health problems, principally in Sub-Saharan Africa [22]. Pregnant women are at a particular risk of adverse events because of a number of factors related either to

the host or to the parasite itself. In fact, malaria in a pregnant women may lead to placental malaria and placental injury and insufficiency or cause an inflammation and disrupt the very limited immunological balance require to maintain pregnancy to term [23].

A unique finding was the lack of a significant association between prematurity and HIV. It is possible that with increasing availability and use of antiretroviral drugs for prophylaxis and treatment of HIV in pregnancy, the impact of HIV on pregnancy outcomes including risk of preterm birth may have been reduced. We think that this fact should be confirm by a multicentre and large sample size, longitudinal observational analytic study.

5. LIMITATIONS AND STRENGTHS

Although this study collected patient level data on premature birth, these numbers were not enough to allow any generalization to the region. Further, this study was undertaken in a tertiary hospital hence extrapolation of results is limited to hospitals with similar status.

Despite these limitations, our quite significant sample size and being the only such study in the province makes our findings useful and relevant in these settings. Hence, further longitudinal analyses will provide stronger evidence in this topic and allow a better generalisation of the results to other populations.

Using a questionnaire administered to the mothers, recall bias could have occurred where some of the mothers were unable to remember some events in their previous pregnancies or even in the index pregnancy so that some of these parameters could have affected the finding. Although we have tried to mitigate this limitation by reviewing of the participants' medical records.

6. CONCLUSION

The prevalence of premature birth at Lubango maternity hospital was 17.7%, which is slightly higher than the 9.5-15.8% prevalence reported by World Health Organization (WHO) for Sub-Saharan Africa [7].

1. The socio- demographic factors associated with prematurity were
   i. Family income (p: 0.032)
   ii. Antecedent of premature birth (p:0.002)
   iii. Use of alcohol (p:0.002)
   iv. ANC (**< 0.001**)
2. The clinical factors associated with prematurity were:
   i. High blood pressure (Pp:0.021)
   ii. Preeclampsia (p:0.026)
   iii. Malaria (p:0.001)
   iv. Multiple gestation (p:0.010)
3. After controlling for cofounders, the significant predictors of prematurity were:
   i. Antecedent of premature birth (P:**0.0049**)
   ii. Malaria (p: 0.008)
   iii. ANC (p: **< 0.001**)
   iv. Multiple gestation (p 0.001)

7. RECOMENDATIONS

- With a prevalence of 17.7%, premature birth is a still a serious problem at lubangopediatric hospital and deserve a multisectoral well-coordinated action.
- ANC clinic should be actively promoted, improved and expended.
- Pregnant women with antecedent of premature birth should be closely monitored
- Preeclampsia and malaria should be prevented, searched and serious treated when present during pregnancy.
- We the recommend a Multicentre and large sample size, longitudinal observational analytic study for better understanding of the principal predictors at a country level

CONSENT AND ETHICAL APPROVAL

Ethical clearance was sought and obtained from the Medical Officers in charge of research at Irene Neto provincial maternity hospital (Ethical certificate number: 001/2020). The study was explained to the mother and a written consent was obtained in order to participate in the study. All client information were handled with a high level of confidentiality and privacy. These data will be used only for the study purpose.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Arafa,M et al. Maternal haemoglobin and premature child delivery. Eastern Mediteranean health journal, 1998,4(3): 480-6.
2. Kromen MS et al secular trends in preterm birth: A hospital- based cohort study. Journal of American Medical association, 1998, 280 (21); 1849-54
3. Kh, Abu Amad, y abed and B. abu Hamad. Risk factors associated with pretem birth in the Gaza strip: Hospital- based case-control study. la revue de sante de la Mediteranee orientale.13(5)2007
4. Elizabeth A, et al . maternal, reproductive and obstetric factors associated with preterm birth in Mulogo hospital –Kampala ; a case control study. Pan Afr Med; 2018.
5. INE. Inquerito de indicators multiplos de saúde- Angola, 2015-2016.
6. Feresu SA, Harlow SD, Welch K, Gillespie RW. Incidence of and sociodemographic risk factors for stillbirth, preterm birth and low birthweight among Zimbabwean women. Paediatr Perinat Epidemiol. 2004;18(Suppl 2):154–63. 12.
7. Peter .W, Aggrey W, Ahmed L, Dalton W,paul N . Prevalence and factors associated with preterm birth at kenyatta national hospital. BMC Pregnancy and Childbirth .2018. 18:107
   Available:https://doi.org/10.1186/s12884-018-1740-2
8. Muglia LJ, Kartz M. the enigma of spontaneous preterm birth. N Engl j Med; 2010. 362: 529-35
9. Davies EL, Bell JS, Bhattacharya S. Preeclampsia and preterm delivery: a population-based case-control study. Hypertens Pregnancy. 2016;35(4):510–19.
   Available:https://doi.org/10.1080/10641955.2016.1190846
10. Carter MF, Fowler S, Holden A, Xenakis E, Dudley D. The late preterm birth rate and its association with comorbidities in a population-based study. Am J Perinatol. 2011;28(9):703–7.
    Available: https://doi. org/10.1055/s-0031-1280592
11. Etuk SJ, Etuk IS, Oyo-Ita AE. Factors influencing the incidence of preterm birth in Calabar, Nigeria. Niger J Physiol Sci. 2005;20(Suppl 1–2):63–8
12. Blencow.H, Krasevec.J, De Onis.M, Black.RE, An.X, Stevens GA et al. National, regional and worldwide estimates of lowbirth weight in 2015: a systematic analysis. Lancet Glob Health;7: e 849-60
13. Jamille Gregorio.D, Rodrigo. M. De Sousa, Natercia M, Andre.B, Sabrina.E, Ligia .G, Claudio.M.. Malaria during pregnancy and newborn outcome in an instable transmission area in Brazil: 2018. A population- based record linkage study.PLos ONE. 13(6): e 0199415.
14. Salanti.A, Staalsoe.T, ,Lavsten.T, Jensen ART, Sowa MPK, Arnot. DE, et al. Selective upregulation of single distinctly structure var genein chondroitin sulfate A adhering plasmodium falciparum involved in pregnancy-associated malaria. Mol Microbiol. 2003. 49: 179-91
15. WHO. ;2020
    Available:https://www.who.int/publication/i/item/9789240015791. Accessed 08 march 2022
16. Nkwabong.E, Mayane DN, Meka.E, Essiben.F. Malaria in the third trimester and maternal -perinatal outcome. Int GynaecalObstct. 2020. 8:13261.
17. 2012. Mokuolu OA, Suleiman B, Adesiyun O, Adeniyi A. Prevalence and determinants of pre-term deliveries in the University of Ilorin Teaching Hospital, Ilorin, Nigeria. Pediatr Rep. 2010 Jun 18; 2(1): e3. PubMed |Google Scholar
18. Van den Broek NR, Jean-Baptiste R, Neilson JP. Factors associated with preterm, early preterm and late preterm birth in Malawi. PLoS One. 2014; 9(Suppl 3):e90128
19. WHO. World malaria report 2020.Geneva> World health organization;2020. https://www.who.int/publication/i/item/9789240015791. Accessed 08 march 2022
20. Joseph KS. recent changes in maternal characteristics by socioeconomic status.jobstgynaecol can. .2009.31: 422-433.
21. Louise. Weile, Hanne Hegaard, Chunsen Wu, Ann Taboret al. Alcohol Intake in Early Pregnancy and Spontaneous Preterm Birth: A Cohort Study Alcohol Clin Exp Res.2020 ;44(2):511-521
22. C M O'Leary, N Nassar, J JKurinczuk, C Bower. The effect of maternal alcohol consumption on fetal growth and preterm birth. BJOG. 2009. Feb;116(3):390-400
23. Florent,F et al. Effect of maternal age on the risk of prterm birth: A large cohort study. PloS One. 2018.

24. Zhang YP, Liu XH, Gao SH, Wang JM, Gu YS, Zhang JY, et al. Risk factors for preterm birth in five maternal and child health hospitals in Beijing. PLoS One.;7(12):1–7. Available:https://doi. 2012. org/10.1371/journal.pone.0052780

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