Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

To Study the Disease Pattern and Immediate Outcome of Admissions of Low Birth Weight Neonate to Neonatal Intensive Care Unit at the Teaching Hospital.

Dr. Rohit Male[1], Dr. Mahesh Patil[2], Dr. Siddheshwar Lakhe[3]*

[1]Senior resident at Dept. of Paediatrics, Vilasrao Deshmukh Government Medical College, Latur.
[2]Assistant Professor at Dept. of Paediatrics, Vilasrao Deshmukh Government Medical College, Latur.
[3]*Senior Resident Dept. of Paediatrics, Vilasrao Deshmukh Government Medical College, Latur.

***Corresponding author –** Dr. Siddheshwar Lakhe
*Senior Resident Dept. of Paediatrics, Vilasrao Deshmukh Government Medical College, Latur.

(Received: 07 October 2023 Revised: 12 November Accepted: 06 December)

KEYWORDS:-

ABSTRACT:

Background- The neonate birth weight represents their initial weight measurement, typically taken within the first few hours after birth, before any significant postnatal weight reduction. Low birth weight is specifically defined as a birth weight below 2500g, in accordance with the World Health Organization's criteria. It is recognized as the primary predictor for neonatal mortality, particularly concerning fatalities occurring within the initial months of life. Aim to the present study to find out the disease pattern and immediate outcome of admissions of low birth weight neonate to Neonatal Intensive Care Unit at the teaching hospital.

Methodology - The study involved a retrospective analysis of medical records for all neonates admitted during the study period were reviewed and analysed for age, weight, gender, reasons for admission, length of hospital stay, diagnosis, and final outcomes were carefully reviewed. This analysis aimed to identify trends and key indicators associated with inpatient neonatal mortality.

Result - The total number of neonates admitted during the study period was 316, 175 were male (55.37%), and 141 were female (44.62%). The majority (77.53%) being cured and discharged, while 22.46% of individuals unfortunately passed away. Notably, the major morbidity contributing to mortality was Respiratory Distress Syndrome (RDS) resulted in a 47.82% mortality rate against 69 admissions, accounting for 36.26% of overall deaths.

Conclusion- Low birth weight remains a significant risk factor for infant mortality, it is imperative to individually assess various starta of LBW under the view of the different determinants of health involved.

Introduction

On a worldwide scale, statistics indicate that, approximately 15–20% of all births, which translates to over 20 million newborns each year, fall into the category of low birth weight infants. Moreover, an estimated 13 million babies are born prior to completing 37 weeks of gestation, a trend that is particularly pronounced in middle and low-income countries. [1]

Low birth weight remains a significant global public health issue, affecting around 15% to 20% of all births worldwide, totaling over 20 million annually. Incidence varies from 6% to 18% globally, with sub-Saharan Africa accounting for 13% to 15%. The aim is to decrease the number of infants born with a weight below 2500 g by 30% by 2025, equating to a 3% relative reduction each year from 2012 to 2025, ultimately reducing the number of low birth weight infants from roughly 20 million to about 14 million.[2] Low birth weight is strongly linked to elevated fetal and perinatal mortality, hindered growth, impaired cognitive development, and the development of chronic diseases in adulthood. When considering the entire population, the prevalence of LBW in newborns serves as an indicator of a complex public health issue encompassing prolonged maternal malnutrition, maternal illness, strenuous labor, and inadequate prenatal care. At an

Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

individual level, LBW is a critical predictor of newborn well-being and survival, correlating with an increased risk of infant and childhood mortality.[3]

In developing countries, low birth weight contributes significantly, accounting for the majority (60% to 80%) of infant mortality. The connection between low birth weight and infant mortality is often straightforward, with other medical complications such as preterm birth, maternal malnutrition, insufficient prenatal care, maternal illness during pregnancy, and unclean living conditions playing direct causal roles. [4-6] According to a large study, which was done in Madani, Sudan in 2010, about 12.7 % of all deliveries was of low birth weight.[7]

There are numerous risk factors associated with low birth weight (LBW) in infants. These factors encompass a range of maternal and lifestyle-related elements. Multiple gestations, the mother's body composition at the time of conception, maternal short stature, maternal nutrition during pregnancy (including lifestyle factors like substance or drug abuse), and medical disorders during pregnancy (including hypertensive disorders) have all been identified as potential contributors to LBW. In addition, mothers with low socio-economic status are susceptible to infections due to inadequate nutrition, which can lead to a decrease in birth weight.[8]

Furthermore, several other risk factors have been linked to LBW. These include maternal diseases such as maternal anemia, chronic hypertension, renal diseases, and heart diseases. Lifestyle factors such as alcohol, smoking, and drug use during pregnancy can also increase the risk of LBW. Other considerations include parity, low maternal education, maternal occupation, extreme maternal age, induced labor or elective caesarean section, and the potential impact of physical, sexual, and emotional abuse.[9-12] Lower birth weight increases the risk of complications. In some cases, intrauterine growth restriction can reduce certain prematurity-related issues. Clinical problems in Very Low Birth Weight (VLBW) and Extremely Low Birth Weight (ELBW) infants include hypothermia, hypoglycemia, fluid and electrolyte imbalances, nutritional problems, hyperbilirubinemia, respiratory distress, and chronic lung disease. Infections also contribute to morbidity and mortality in VLBW and ELBW infants.[13,14,15] A 2016 study conducted in northern Tanzania found a connection between low birth weight and negative perinatal outcomes. The study suggests that, early detection of risk factors for low birth weight in high-risk pregnant women through prenatal monitoring can potentially mitigate these adverse perinatal outcomes.[16]

Similarly, a study in Ethiopia in 2018 reached a similar conclusion. It highlighted the significance of health education and information regarding maternal nutrition, addressing the use of psychoactive substances, and providing social support during pregnancy as vital interventions to enhance birth weight in Ethiopia.[17] Low birth weight (LBW) stands as a prevalent contributor to neonatal morbidity and mortality, representing roughly one-third of neonatal fatalities. The reduction of LBW plays a pivotal role in lowering neonatal mortality rates and overall infant mortality rates. In fact, LBW is regarded as the primary and most influential predictor of neonatal mortality, particularly with regard to deaths that occur within the first months of life.[18] This present study aims to assess the disease pattern and immediate outcome of LBW neonates admitted in neonatal intensive care unit.

Methodology

Study Design and Population:

This prospective study focused on LBW babies admitted to the NICU of a teaching hospital during a one-year period (1st March 2012 to 28th February 2013), with specific inclusion and exclusion criteria.

Inclusion Criteria:

1. All LBW babies within the neonatal period (first 28 days of life) admitted to the NICU.
2. Babies whose parents/guardians provided valid informed consent.
3. Babies with a birth weight under 1800g, not requiring admission for any specific reason, were observed.

Exclusion Criteria:

1. Babies without parental consent.
2. LBW neonates who left against medical advice.
3. Neonates with a weight over 2.5 kg.
4. Babies with congenital malformations, excluding congenital heart diseases.

Ethical Consideration:

The study design and methodology was approved by the institutional ethical committee.

Method of Data Collection and Analysis:

After getting a valid consent the babies were included in the study. According to their place of birth they were divided as inborn or outborn and hence were kept in two separate blocks; inborn in aseptic NICU and outborn in septic NICU. Data of all the babies was recorded in prefixed format **(Annexure-B)**. The data included the basic information for the baby i.e. name, name of parents, informant and demographic factors (age, weight at time of admission, sex), reason for admission, maternal history, birth history, place of delivery, resuscitation details if available, socio economic history of the family, anthropometric measurements, referral history, detailed examination findings, duration of

Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

hospital stay, progress during admission, prognosis and final outcome (cured and discharged/ died) of the patient.

The data also included investigation done at the hospital. The diagnosis was finalized as per the working definitions depending on the clinical examination and was supported by the investigations. The information also included the details of condition of baby during discharge along with the advice given to the parents. It also included the follow up record for the patient, but this was not studied during the statistical analysis.

The whole data was compiled and analysed. The statistical analysis was done with help of Epi Info Version 3.5.1 software and appropriate test in order to find out the significance for the observations.

Results-

Table-1: Weight and sex wise distribution of LBW neonates admitted in NICU**.**

WEIGHT (gms)	Sex		TOTAL
	MALE	FEMALE	
<1000	11 (52.38)	10 (47.61)	21(100)
1000 TO 1499	37 (57.81)	27 (42.18)	64 (100)
1500 TO 1999	82 (55.03)	67 (44.96)	149(100)
2000 TO 2499	45 (54.87)	37 (45.12)	82 (100)
TOTAL	175 (55.37)	141 (44.62)	316 (100)

This table1 provides a breakdown of the number of individuals in different weight categories based on their sex. For example, in the 1000 to 1499 g weight category, there are 64 individuals in total. Among these, 37 were male, accounting for 57.81% of the total individuals in this weight category, and 27 are female, accounting for 42.18%. The percentages in parentheses indicate the proportion of males and females within each weight category.

Table-2: Outcome of LBW neonates admitted in NICU according to their sex, weight and Gestational age.

Sr.no.	Sex	Survivors	Deaths	Total
1	Male	134 (76.57)	41 (23.42)	175 (100)
2	Female	111 (78.72)	30 (21.27)	141 (100)
Total		245 (77.53)	71 (22.46)	316 (100)
Sr.no.	**Weight (gms)**	**Survivors**	**Deaths**	**Total**
1	<1000	05 (28.80)	16 (76.19)	21 (100)
2	1000 to 1499	43 (67.18)	21 (32.81)	64 (100)
3	1500 to 1999	123 (82.55)	26 (17.44)	149 (100)
4	2000 to 2499	74 (90.24)	08 (9.75)	82 (100)
	Total	245 (77.53)	71 (22.46)	316 (100)
Sr. No.	**Gestational age (wks)**	**Survivors**	**Deaths**	**Total**
1	< 28	08 (29.62)	19 (70.37)	21 (100)
2	28 to 32	79 (77.45)	23 (22.54)	102 (100)
3	33 to 36	86 (80.37)	21 (19.62)	107 (100)
4	37 to 42	72 (90)	08 (10)	80 (100)
Total		245 (77.53)	71 (22.46)	316 (100)

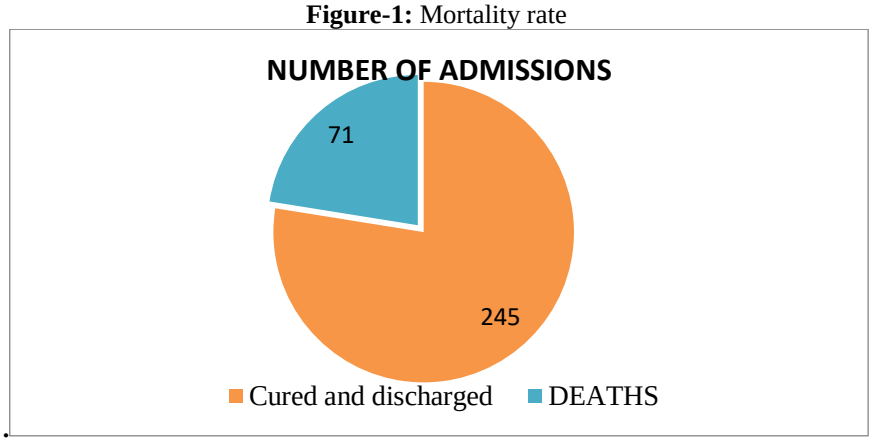
The study analyzed 316 admissions, including 175 males and 141 females, aiming to understand mortality patterns. Surprisingly, there was no significant gender-based difference in mortality ($X^2 = 0.21$, df = 1, $p = 0.64$). However, weight significantly impacted mortality rates ($X^2 = 48.48$, df = 3, $p < 0.0001$), indicating a correlation between weight categories and mortality. Additionally, mortality was inversely proportional to gestational age ($X^2 = 43.20$, df = 3, $p < 0.0001$), highlighting higher mortality rates in premature infants. Mean gestational age for males was 33.48 weeks, females 33.35 weeks, and the overall group 33.43 weeks, providing essential context for the study's findings.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

Figure-1: Mortality rate



The graph shows the distribution of outcomes for 316 individuals, with the majority (77.53%) being cured and discharged, while 22.46% of individuals unfortunately passed away.

Table-3 : Deaths of LBW neonates admitted in NICU according to their stay in NICU**.**

SR. NO.	NICU STAY (DAYS)	DEATHS	PERCENTAGE
1	< 1	28	39.43
2	1 TO 3	19	26.76
3	4 TO 7	14	19.71
4	8 TO 28	10	14.08
TOTAL		71	100

Infants in the NICU experienced varying lengths of stay, each associated with distinct mortality rates. Regrettably, within the first day of NICU admission, 28 infants, constituting 39.43% of all deaths, passed away. Additionally, 19 infants (26.76% of total deaths) stayed for 1 to 3 days but did not survive. Another 14 infants (19.71% of total deaths) spent 4 to 7 days in the NICU, yet succumbed to their conditions. Lastly, 10 infants (14.08% of total deaths) had NICU stays ranging from 8 to 28 days, but sadly, they did not survive despite the prolonged medical attention.

Table-4: Causes of deaths for neonates admitted in NICU[#] with selected morbidities.

SR NO	MORBIDITY	NUMBER OF ADMISSIONS	DEATHS	PERCENTAGE OF DEATHS AGAINST ADMISSION	PROPORTIONAL MORTALITY RATE
1	SEPTICAEMIA	140	28	20	30.76
2	RDS	69	33	47.82	36.26
3	NJ	68	3	4.4	3.29
4	BIRTH ASPHYXIA	35	13	37.14	14.28
5	MAS	23	2	8.69	2.19
6	HPC	15	3	20	3.29
7	NEC	12	4	33.33	4.39
8	HPG	8	1	12.5	1.09
9	CHD	8	4	50	4.39
TOTAL		378	91	24.07	100

The data outlines specific morbidities and their corresponding mortality rates in a group of admissions. Septicaemia, with 140 cases, had a 20% mortality rate, contributing to 30.76% of total deaths. Respiratory Distress Syndrome (RDS) resulted in a 47.82% mortality rate against 69 admissions, accounting for 36.26% of overall deaths. Neonatal Jaundice (NJ) had a

Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

4.4% mortality rate against 68 cases, contributing to 3.29% of total deaths. Birth Asphyxia, in 35 cases, had a 37.14% mortality rate, contributing to 14.28% of total deaths. Meconium Aspiration Syndrome (MAS) had an 8.69% mortality rate against 23 cases, contributing to 2.19% of total deaths. Hypoxic-ischaemic Encephalopathy (HPC) showed a 20% mortality rate against 15 cases, contributing to 3.29% of total deaths. Necrotizing Enterocolitis (NEC) had a 33.33% mortality rate against 12 cases, contributing to 4.39% of total deaths. Hypoglycemia (HPG) showed a 12.5% mortality rate against 8 cases, contributing to 1.09% of total deaths. Congenital Heart Disease (CHD) recorded a 50% mortality rate against 8 cases, contributing to 4.39% of total deaths.

Discussion:-

During the study period, total 316 LBW babies were admitted to the NICUThe monthly average for admissions was 26.33.

In a recent study involving a total of 316 admissions, it was found that, 175 (55.37%) of these admissions were for males, while 141 (44.62%) were for females. This data indicates a male predominance in admissions for LBW (Low Birth Weight) neonates. The outcomes of the current study were compared to a previous performance study conducted by **Ahmed SAM et al.[19]** This earlier study found a predominance of male admissions for LBW (Low Birth Weight) neonates, with males comprising 51.7% of the admissions. In this study with 316 admissions for Low Birth Weight (LBW) neonates, 77.53% survived, and 22.46% unfortunately passed away. Survival rates were similar for males and females, with a slightly higher rate for females (78.72% vs. 76.57%). The study suggests that LBW neonates, regardless of gender, had comparable survival chances, indicating similar care provided to both sexes. In a systematic review conducted by **A. T. Gebremeskel** and their colleagues, the researchers focused on a current study. They discovered that the majority of the study's outcomes indicated that, seven studies reported a higher number of male deaths among low birth weight (LBW) infants, while three studies reported a higher number of female deaths in the same group. Furthermore, one study did not provide a breakdown of deaths by gender. Out of the 11 studies that examined gender differences in mortality among LBW newborns and infants, nine of them did not find significant evidence of gender disparities in mortality. Similarly, no significant differences were observed in terms of gender disparities in morbidity within this population.[20]

In a recent study with 316 admissions, infants weighing less than 1000 grams had the highest mortality rate at 76.19%, while those weighing between 2000 and 2499 grams had the lowest at 9.75%. The death rate for low birth weight (LBW) neonates in the Neonatal Intensive Care Unit (NICU) was statistically significant ($p < 0.0001$). The mean birth weight in the NICU was 1.67 kilograms, with a standard deviation of 0.41. Mortality rates increased as birth weight decreased, with 22.53% in the <1000 grams group, 29.57% in the 1000 to 1499 grams group, 36.61% in the 1500 to 1999 grams group, and 11.26% in the 2000 to 2499 grams group. A similar study conducted by **Vilanova, C.S**,[21] yielded findings that were correlated with the current study. The outcomes of our study reveal striking disparities in neonatal mortality rates based on birth weight categories. Extremely low birth weight infants (500–999 grams) experienced a remarkably high mortality rate of 207.04 per 100 births, and infants weighing 1000–1499 grams had a substantial rate of 41.1 per 100 births. Meanwhile, infants in the 1500–2499 grams category exhibited a significantly lower mortality rate of 5.76 per 100 births, with all categories demonstrating statistical significance ($p < 0.001$). In contrast, infants with birth weights of 2500–2999 grams or more had substantially lower mortality rates at 1.86 per 100 births and 0.97 per 100 births, respectively. These findings underscore the critical role of birth weight in predicting neonatal survival, with lower birth weights associated with significantly higher mortality rates. Furthermore, the correlation with Vilanova, C.S's study highlights the consistency of these observations across different research contexts.

Among 316 admissions, neonatal mortality varies significantly with gestational age. Mortality rates were highest for infants born at less than 28 weeks (70.37%) and lowest for those born after 37 weeks (10%). These differences were statistically significant ($p < 0.0001$). The mean gestational age was approximately 33.43 weeks, with slight variations between male and female infants. Of the 71 deaths, 26.76% occurred in infants with less than 28 weeks of gestation, 32.39% in the 28 to 32 weeks category, 29.57% in the 33 to 36 weeks category, and 11.26% in infants born after 37 weeks. This finding aligns with the results of a study conducted by Wondie et al.[22] In this study, another significant predictor of mortality was prematurity, which was associated with nearly twice the risk of death compared to LBW neonates with a gestational age of 37 weeks or more.

In the recent study, the most significant contributors to neonatal deaths were respiratory distress syndrome (RDS), birth asphyxia, and septicemia, with death rates of 47.82%, 37.14%, and 20%, respectively. Septicemia, despite a relatively high morbidity rate, had a lower death rate of 20% but a higher proportional mortality rate of 30.76. Other conditions, including meconium

Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

aspiration syndrome, hypocalcemia, necrotizing enterocolitis, hypoglycemia, and congenital heart diseases, also played a role in neonatal mortality. In total, there were 378 admissions and 91 deaths, resulting in a 24.07% death rate against admissions outcomes of the present study were correlated toa similar study conducted by **Wondie et al**[22] revealed that, the incidence of mortality among low birth weight neonates in their first week of life was 75.63 per 1000 neonate-day observations (95% CI: 66.76–85.67). Several factors were identified as predictors of mortality, including preeclampsia (AHR = 1.77; 95% CI: 1.32–2.36), perinatal asphyxia (AHR = 1.64; 95% CI: 1.14–2.36), respiratory distress syndrome (AHR = 1.76; 95% CI: 1.31–2.34), necrotizing enterocolitis (AHR = 2.78; 95% CI: 1.79–4.32), prematurity (AHR = 1.86; 95% CI: 1.30–2.67), and low birth weights (<1000 grams with AHR = 3.13; 95% CI: 1.91–5.12, and 1000–1499 grams with AHR = 1.99; 95% CI: 1.47–2.68) as significant predictors of neonatal mortality.

Conclusion

The study highlights the critical importance of the first 72 hours of a neonate's life, as perinatal complications predominantly occur during this period. Male predominance was noted in both admissions and deaths. The leading causes of neonatal admissions and mortality were sepsis, respiratory distress syndrome, and birth asphyxia. To reduce neonatal deaths, it's essential to enhance newborn care support systems, improve labor room practices, and work cohesively to prevent avoidable NICU admissions. Strengthening cost-effective interventions like home-based treatment, proper infant care, and breastfeeding promotion is crucial in preventing early neonatal deaths. Ultimately, while low birth weight remains a significant risk factor for infant mortality, it is imperative to individually assess various sstarta of LBW under the view of the different determinants of health involved. This approach allows for the implementation of more effective and targeted healthcare measures within different LBW categories.

Reference

1. Lawn JE, Gravett MG, Nunes TM, et al. Global report on preterm birth and stillbirth (1 of 7): definitions, description of the burden and opportunities to improve data. BMC Pregnancy Childbirth 2021;10(1): 2393-10.
2. WHO Global Nutrition Targets 2025: Low birth weight policy brief - World Health Organization 2014, https://fctc.who.int/publications/i/item/WHO-NMH-NHD-14.5
3. 3. Tamani Ahmed Bahr Ali, Nader Mutwakel Osman, Niemat Mohammed Tahir Ali, and AlamEldin Musa Mustafa. "Pattern of Low Birth Weight and Early Outcome of Neonates Admitted at Neonatal Unit in Omdurman Maternity Hospital from December 2019 to May 2020." Bahrain Medical Bulletin, March 2022 vol. 44, no. 1,
4. Liu L, Oza S, Hogan D. Global, regional, and national causes of child mortality in 2000-13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet 2015;385(9966):430-40.
5. 5. Endeshaw G, Berhan Y. Perinatal Outcome in Women with Hypertensive Disorders of Pregnancy: A Retrospective Cohort Study. CurrPediatr Rev 2020;16(1):71-78.
6. Expectancy WL. Low birth weight in Ethiopia USA.
7. Mmbaga BT, Lie RT, Olomi R, et al. Cause-specific neonatal mortality in a neonatal care unit in Northern Tanzania: a registrybased cohort study. BMC Pediatr 2012; 12:11
8. World Health Organization and UNICEF Low birth weight: country, regional and global estimates, New York WHO, Geneva (2013)
9. Belbasis L, Savvidou MD, Kanu C, et al. Birth weight in relation to health and disease in later life: an umbrella review of systematic reviews and meta-analyses. BMC Med 2016;14(1):147.
10. Demelash, H., Motbainor, A., Nigatu, D. *et al.* Risk factors for low birth weight in Bale zone hospitals, South-East Ethiopia : a case–control study. *BMC Pregnancy Childbirth* **15**, 264 (2015). https://doi.org/10.1186/s12884-015-0677-y
11. Feresu SA, Harlow SD, Woelk GB. Risk Factors for Low Birthweight in Zimbabwean Women: A Secondary Data Analysis. PLoS One 2015;10(6):e0129705.
12. Kayode GA, Amoakoh-Coleman M, Agyepong IA, et al. Contextual risk factors for low birth weight: a multilevel analysis. PLoS One 2014;9(10):e109333
13. Corpeleijn WE, Kouwenhoven SM, van Goudoever JB. Optimal growth of preterm infants. World Rev Nutr Diet 2013;106:149-55.
14. 22. Lopez E, Gascoin G, Flamant C, et al. French Young Neonatologist Club. Exogenous surfactant therapy in 2013: what is next? Who, when and how should we treat newborn infants in the future? BMC Pediatr.2013;13:165.
15. 23. Dritsakou K, Liosis G, Gioni M, et al. CRP levels in extremely low birth weight (ELBW) septic infants. J Matern Fetal Neonatal Med 2015;28(2):237-239
16. Mitao M, Philemon R, Obure J, et al. Risk factors and adverse perinatal outcome associated with low birth weight in Northern Tanzania.- : a registry-based retrospective cohort study. Asian Pacific J Rep 2016; 5(1):75-79.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2023) 13(6), 3044-3050 | ISSN:2251-6727

17. 28. Bililign N, Legesse M, Akibu M. A Review of Low Birth Weight in Ethiopia: Socio-Demographic and Obstetric Risk Factors. Glob J Res Rev 2018;5(1):4.
18. Mansour E, Eissa AN, Nofal LM, et al. Morbidity and mortality of low-birth-weight infants in Egypt. East Mediterr Health J 2005;11(4):723-31.
19. Ahmed SAM, Ali MAO, Mahgoub EAA, et al. The pattern of admission and outcome of neonates managed in the neonatal intensive care unit in a Sudanese hospital. Int J ContempPediatr 2021;8:616-24
20. Gebremeskel AT, Fantaye AW, Faust L, Obegu P, Yaya S. Gender differences in survival among low birthweight newborns and infants in sub-Saharan Africa: a systematic review. Int Health. 2022 Mar 2;14(2):122-131.
21. Vilanova, C.S., Hirakata, V.N., de Souza Buriol, V.C. *et al.* The relationship between the different low birth weight strata of newborns with infant mortality and the influence of the main health determinants in the extreme south of Brazil. *Popul Health Metrics* **17**, 15 (2019).
22. Wondie WT, Zeleke KA, Wubneh CA. Incidence and predictors of mortality among low birth weight neonates in the first week of life admitted to the neonatal intensive care unit in Northwestern Ethiopia comprehensive specialized hospitals, 2022. Multi-center institution-based retrospective follow-up study. BMC Pediatr. 2023 Sep 27;23(1):489.