©NIJBAS
Publications 2023

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

NEWPORT INTERNATIONAL JOURNAL OF BIOLOGICAL AND APPLIED SCIENCES (NIJBAS)

Volume 3 Issue 2 2023

Prevalence and Factors Associated with Birth Asphyxia among Newborns in Fort Portal Regional Referral Hospital Kabarole District Western Uganda

Etenu Jeremiah

Faculty of Clinical Medicine and Dentistry Kampala International University Western Campus Uganda.

ABSTRACT

Birth asphyxia also called perinatal asphyxia describes a condition of prolonged lack of oxygen leading to brain hypoxia. The World Health Organisation defines Birth Asphyxia as the failure to initiate and sustain spontaneous breathing at birth. However, in resource-replete settings, the definition of birth asphyxia includes parameters related to impaired gas exchange such as acidaemia due to interruption of placental blood flow. It is a major contributor to neonatal mortality worldwide causing 24% of all neonatal deaths and 11% of deaths of children under five. The aim of the study was to determine the prevalence and factors associated with birth asphyxia in Fort Portal Regional Referral Hospital. A hospital-based, cross-sectional study with quantitative methods of data collection was conducted in the neonatal unit of Fort Portal Regional Referral Hospital. A structured questionnaire was used to collect information on neonatal and maternal variables. The neonates were diagnosed with birth asphyxia if the APGAR score was less than 7 in the 1st and 5th minutes. The data collected was analyzed using SPSS version 20.0 and results were presented in frequency tables and pie charts. Out of the 200 neonates enrolled, 22.5% had birth asphyxia. The prevalence of birth asphyxia was high among infants whose mothers had been in labour for greater than 12 hours (34.4 %), gave birth by cesarean section (52.0 %), primiparous (26.8 %), mothers aged below 20 years (35.5%), babies with birth weight less than 2.5kg (29.6%), male babies (25.2%) and those below 28weeks of gestation (66.7%). The prevalence of birth Asphyxia is high in Fort Portal Regional Referral Hospital. Factors influencing the occurrence of birth asphyxia were duration of labour, mode of delivery, parity, maternal age, birth weight, neonatal gender and gestational age. Mothers in labour should be adequately monitored and timely appropriate decisions on the mode of delivery taken to minimize the risks of birth asphyxia. Community sensitization and provision of family planning services to prevent early pregnancies should be undertaken.

Keywords: Birth asphyxia, Placental blood flow, Neonatal mortality, Mothers, Children.

INTRODUCTION

Birth asphyxia also called perinatal asphyxia describes a condition of prolonged lack of oxygen leading to brain hypoxia. The World Health Organization (WHO) defines Birth Asphyxia (BA) as the failure to initiate and sustain spontaneous breathing at birth. However, in resource-replete settings the definition of birth asphyxia includes parameters related to impaired gas exchange such as acidemia due to interruption of placental blood flow (PBF). It is a major contributor to neonatal mortality worldwide causing 24% of all neonatal deaths and 11% of deaths of children under five [1]; [2]. Almost all deaths occur in the first week and were associated with financial and

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

emotional implications to the families involved. Globally, up to 30 million newborns require some level of inpatient care [3]. An estimated 2.5 million newborns die during the first month every year, 80% due to low birth weight (LBW) and two-thirds are born prematurely. Neonatal mortality rates (NMRs) vary between countries from 0.9 to 44 deaths per 1000 live births. Almost all occur in Low and Middle-income countries (LMICs). The pooled prevalence of Birth asphyxia in East and central Africa was 15.9% [4]. Regional subgroup analysis indicated a pooled prevalence of 18% and 9.1% in East and Central African countries respectively. The variation was attributed to differences in Asphyxia measuring tools. In Northern Ethiopia, the prevalence of birth Asphyxia was found to be 18% [5]. Another study revealed a prevalence of 32.8% in Southern Ethiopia [6]. As is the case with other countries in Sub-Saharan Africa, East African countries face a high burden of Birth Asphyxia. In a study in Rwanda, the prevalence of birth asphyxia was reported to be 39.7% [7] In Uganda, perinatal death remains higher than the every Newborn Action Plan (ENAP) target of ≤ 4/1000 births. According to the 2015 UNICEF report, Birth Asphyxia accounted for 28.6% of all neonatal deaths. The average annual incidence of birth asphyxia in Uganda increased by 4.5% from 2017 to 2020 [4]. There was an increase of 6% and 5% in the Northern and Eastern regions respectively. Admission of patients with birth asphyxia increased during the early stages of Covid-19 [8]. The prevalence of birth asphyxia was determined to be 4.8% in western Uganda [9].

Statement of Problem

Birth asphyxia is a major contributor to neonatal mortality worldwide. Globally, 2 to 10 per 1000 live births face perinatal asphyxia [10]. According to a study by [11] and [12], the incidence of birth asphyxia is 2 per 1000 live births in high-income countries but the rate is up to 10 times in low-income countries. In Ethiopia, the prevalence of perinatal asphyxia was determined to be 22.52% [13]. Another study demonstrated a prevalence of 22.6% [14]. Despite the adoption of interventions advised by every Newborn Action Plan (ENAP) in 2015, birth asphyxia is still a major public health problem in Uganda. According to the [15] Maternal and Perinatal Death Surveillance and Response (MPDSR) report 2021/22, birth asphyxia accounted for over 50% of perinatal deaths in hospitals that conducted audits. The precise burden could even be higher given the fact that not all hospitals report and conduct audits. The precise burden of birth asphyxia and associated factors in Fort Portal Regional Referral Hospital has not been well studied. Similarly, there is paucity of published data regarding the prevalence and factors influencing the occurrence of birth asphyxia in Uganda. This study will document the prevalence and factors influencing the occurrence of birth asphyxia in Fort Portal Regional Referral Hospital.

Aim

Prevalence and Factors Associated with Birth Asphyxia Among Newborns in Fort Portal Regional Referral Hospital Kabarole District Western Uganda.

Specific Objectives

i. Obstetric factors associated with birth asphyxia among newborns in Fort Portal Regional Referral Hospital.
ii. Prevalence of birth asphyxia among newborns in Fort Portal Regional Referral Hospital.
iii. Neonatal factors associated with birth asphyxia among newborns in Fort Portal Regional Referral Hospital?

Research Questions

- What is the prevalence of birth asphyxia among newborns in Fort Portal Regional Referral Hospital?
- What are the obstetric factors associated with birth asphyxia among newborns in Fort Portal Regional Referral Hospital?
- What are the neonatal factors associated with birth asphyxia among newborns in Fort Portal Regional Referral Hospital?

METHODOLOGY

STUDY DESIGN

This was hospital-based descriptive cross-sectional study with quantitative methods of data collection.

Area of Study

The study was carried out in Fort Portal Regional Referral Hospital, located in Fort Portal district; western Uganda.

Study Population

The study population was all neonates delivered in Fort Portal Regional Referral Hospital both by normal vaginal delivery and caesarean section during data collection.

Inclusion Criteria

All neonates delivered in Fort Portal Regional Referral Hospital whose mothers consented to the study.

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

Exclusion criteria

- Seriously ill neonates in the ICU
- Neonates who were referred from other Health centres to Fort Portal Regional Referral Hospital.
- Neonates whose mothers declined consent.

Sample Size Determination

The sample size was determined using Kish and Leslie (1965) formula.

$N = Z^2P(1-P)/E^2$

N = Estimated minimum sample size required

P = 15.9

Z = 1.96(For 95% confidence interval)

E = Margin of error set at 5%

$N = 1.96^2 0.159(1-0.159)/0.05^2$

N = 205

Therefore, the estimated samples were 205 however the researcher used a total sample of 200participants.

Sampling Techniques

A systematic sampling technique was used to select the study sample. A list of babies from the record book was made, then every third participant from the serial of the list was considered for the interview till the desired sample was attained.

Data collection methods

A structured questionnaire was used to gather information on relevant to the study objectives. The questionnaire was translated to the local language to ease understanding to the participants.

A Neonate was diagnosed with Birth Asphyxia if the APGAR score was less than 7/10 in the 1st and 5th minute.

Data analysis

Data was checked for completeness and accuracy, data was entered, and cleaned and analyzed using SPSS version 20.0. Descriptive, statistics like frequency tables and pie charts were used to summarize the data.

Quality control

The research assistants were trained a week prior to data collection and pretesting of the questionnaires was done outside the study setting.

Ethical considerations

Approval from the Institutional Review Board and Ethics Committee of Kampala International University was sought. Permission to carry out the research was then obtained from the hospital Executive Director. Confidentiality was observed throughout and after the study.

RESULTS

Prevalence of birth asphyxia among newborns in Fort Portal Regional Referral Hospital.

According to the study, out of the 200 patients enrolled, 22.5% had birth asphyxia as shown in the figure below.

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

Prevalence of birth asphyxia

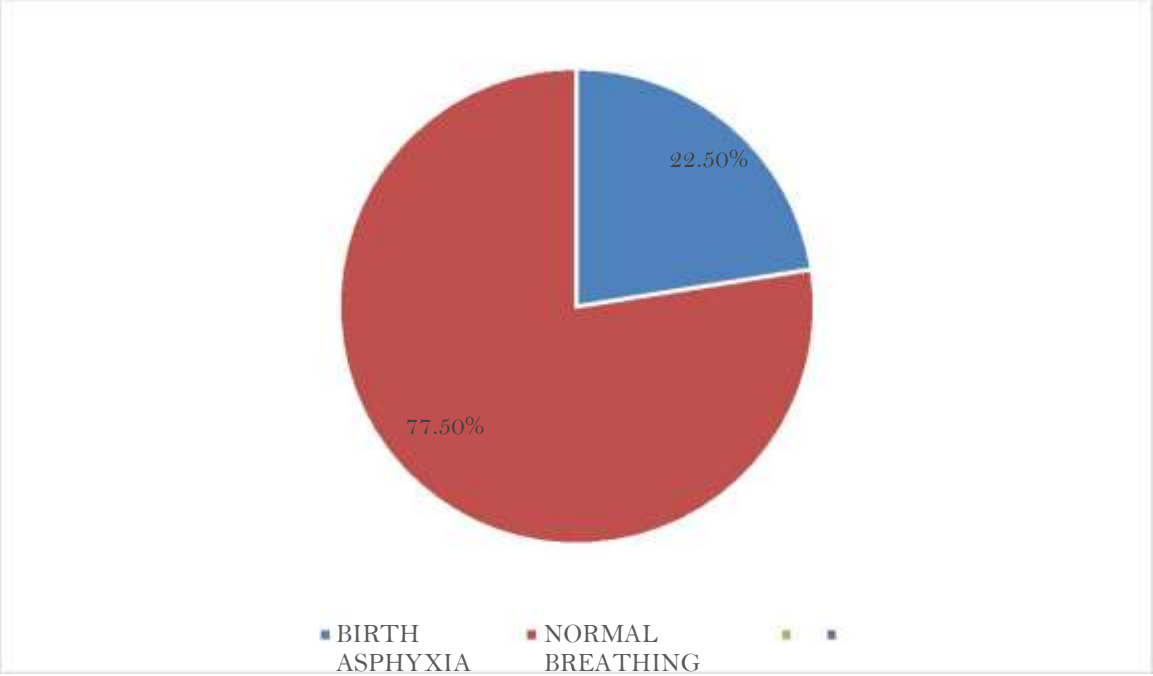

Figure 1: Obstetric factors associated with birth asphyxia among newborns in Fort Portal Regional Referral Hospital.

In this study, a majority of mothers (55.0%) had labour which lasted less than 12 hours, 87.5% gave birth vaginally, 51.5% were multiparous and 57.5% were aged 21-30years as shown in table 1 below.

Table 1:Obstetric factors

Variable	Category	Frequency(n)	Percentage (%)
Duration of Labour	≤12hours	110	55.00
	≥12hours	90	45.00
Mode of Delivery	Vaginal Delivery	175	87.50
	Cesarean Section	25	12.50
Parity	Primiparous	97	48.50
	Multiparous	103	51.50
Maternal age	≤20 years	31	15.50
	21-30years	115	57.50
	≥31years	54	27.00

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

Association between obstetric factors and birth asphyxia

According to the study, the prevalence of birth asphyxia was high among infants whose mothers Had been in labour for greater than 12hours (34.4%), gave birth by cesarean section (52.0%), primiparous (26.8%) and were aged below 20years (35.48%) as shown in table 2 below:

Table 2: Association between obstetric factors and birth asphyxia

Variable	Category	Frequency(n)	Birth asphyxia	
			Frequency	Percentage
Duration of Labour	≤12hours	110	14	12.73%
	≥12hours	90	31	34.44%
Mode of Delivery	Vaginal Delivery	175	32	18.29%
	Cesarean Section	25	13	52.00%
Parity	Primiparous	97	26	26.80%
	Multiparous	103	19	18.45%
Maternal Age	≤20 year	31	11	35.48%
	21-30years	115	21	18.26%
	≥31years	54	13	24.07%

Note: A neonate was diagnosed with birth asphyxia after 1st and 5th minute.

Neonatal factors associated with birth asphyxia among newborns in fort portal regional referral hospital.

Majority of the neonates in the study had birth weight of 2.5-3.5kg (56.00%), male (57.50%) and were born at gestational age 29-36weeks (47.50%) as shown in table 3 below.

Table 3: Neonatal factors

Variable	Category	Frequency(n)	Percentage (%)
Birthweight	≤2.g5k	71	35.50
	2.5-3.5Kg	112	56.00
	≥3.5kg	17	8.50
Sex	Male	115	57.50
	Female	85	42.50
Gestational Age at birth	≤28 weeks	21	10.50
	29-36weeks	95	47.50
	≥37weeks	84	42.00

Association between neonatal factors and birth asphyxia

According to the study, the prevalence of birth asphyxia was high among neonates who had birth weight of less than 2.5kg (29.58%), males (25.22%) and those below 28weeks of gestation (66.67%) as shown in table 4 below.

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

Table 4:Association between neonatal factors and birth Asphyxia

Variable	Category	Frequency(n)	Birth asphyxia	
			Frequency	Percentage
Birthweight	≤2.5kg	71	21	29.58%
	2.5-3.5Kg	112	20	17.86%
	≥3.5kg	17	04	23.53%
Sex	Male	115	29	25.22%
	Female	85	16	18.82%
Gestational	≤28 mon	21	14	66.67%
Age at birth	29-36months	95	17	17.89%
	≥37mont	84	14	16.67%

DISCUSSION

Prevalence of birth asphyxia among newborns

According to the current study, the prevalence of birth asphyxia among newborns was determined to be 22.5%. This is lower than the prevalence of 22.8% reported in review [16]. However, its higher than the prevalence of 15.9% in East and Central Africa [4] This prevalence is also very high compared to the findings of a study in Ishaka Adventist hospital which revealed a prevalence of 4.8% [10]. Compared to other studies, the results may have been influenced by the occurrence of Covid-19 pandemic.

Obstetric factors associated with birth asphyxia among newborns.

In the present study, birth asphyxia was more prevalent among neonates born to mothers whose labour lasted at least 12hours (34.44%) This was consistent with the findings of a study [17] which revealed that prolonged labour was associated with birth asphyxia. This finding is also is concordant with the results of the study [18] which showed a significant association between prolonged labour and birth asphyxia. During labour, there is reduced feto-placental circulation so prolonged labour puts neonates at a high risk of birth Asphyxia. In the study, neonates born by cesarean section were more likely to develop birth asphyxia (52.00%) compared to those born by vaginal delivery. The finding is congruent with results revealed by two studies [17] and [18]. Most mothers who deliver by Ceaserean section come in late with complications of labour. Also, late decision to do cesarean section by health care professionals may influence the occurrence of birth asphyxia among neonates. Neonates, born to primipara mothers were more likely to develop birth asphyxia (26.80%) This finding agrees with a study [19] which showed more prevalence among neonates born to primiparous women. Also congruent with the findings of a study [18] which revealed the same results. This may be because primiparous women could have inadequate uterine contractions which prolongs labour hence predisposing to birth asphyxia. Also, the lack of experience in this mothers accompanied with poor cooperation during labour may predispose to birth asphyxia. Neonates, born to mothers below 20years of age were more likely develop birth asphyxia (35.48%) than those above 20years. The finding is consistent with a study [6] which revealed that maternal age less than 20 years was associated with birth asphyxia. Most mothers below 20years do not have adequate knowledge.

Neonatal factors associated with birth asphyxia among newborns

According to the study, the prevalence of birth asphyxia was more among those who had birth weight below 2.5kg (29.58%) A study [2] also found out that the prevalence of birth asphyxia was more among neonates with birth weight less 2.5kg. The finding also agrees with the findings of a study [16]. This may be attributed to pre-existing maternal conditions that cause low birth weight which increase the likelihood of birth Asphyxia. The current study found out that the prevalence of birth asphyxia was more among male neonates (25.22%) compared to females. The finding is similar to the finding of a study done in Rwanda [20-23]. This finding is most likely incidental given the fact that the number of male infants in the study was more than that of female infants. The study found the prevalence of birth asphyxia to be higher among neonates born below 28weeks of gestation (66.7 %). This is consistent with studies done in Ethiopia and elsewhere [19-23]. This may be attributed to the fact that premature neonates are more susceptible to brain ischemia.

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

CONCLUSION

The prevalence of birth Asphyxia is high in Fort Portal Regional Referral Hospital. Factors influencing the occurrence of birth asphyxia were duration of labour, mode of delivery, parity, maternal age, birth weight, neonatal gender and gestational age.

RECOMMENDATION

- Mothers in labour should be adequately monitored and timely appropriate decisions on mode of delivery taken to minimize the risks of birth asphyxia.
- Community education and provision of family planning services to prevent early pregnancies.

REFERENCES

1. World Health Organization, (2018). Survive and thrive: small and sick newborn.
2. Abdo, R. A., Halil, H. M., Kebede, B. A., Anshebo, A. A., & Gejo, N. G. (2019). Prevalence and contributing factors of birth asphyxia among the neonates delivered at Nigist Eleni Mohammed memorial teaching hospital, Southern Ethiopia: A cross-sectional study. *BMC Pregnancy and Childbirth*, *19*(1). https://doi.org/10.1186/s12884-019-2696-6.
3. World Health Organization, & UNICEF. (2019). Survive and thrive: small and sick newborn.
4. Workineh, Y., Semachew, A., Ayalew, E., Animaw, W., Tirfie, M., & Birhanu, M. (2020). Prevalence of perinatal asphyxia in East and Central Africa: systematic review and meta-analysis. In *Heliyon* (Vol. 6, Issue 4). Elsevier Ltd. https://doi.org/10.1016/j.heliyon.2020.e03793.
5. Gebregziabher, G. T., Hadgu, F. B., & Abebe, H. T. (2020). Prevalence and Associated Factorsof Perinatal Asphyxia in Neonates Admitted to Ayder Comprehensive Specialized Hospital, Northern Ethiopia: A Cross-Sectional Study. *International Journal of Pediatrics (United Kingdom)*, *2020*. https://doi.org/10.1155/2020/4367248.
6. Alemu, A., Melaku, G., Abera, G. B., & Damte, A. (2019). Prevalence and associated factors of perinatal asphyxia among newborns in Dilla University referral hospital, Southern Ethiopia–2017 . *Pediatric Health, Medicine and Therapeutics*, *Volume 10*, 69–74. https://doi.org/10.2147/phmt.s196265.
7. Uwingabire, F., & Gowan, M. (2019). Birth asphyxia at a district hospital in Kigali, Rwanda. *Rwanda Journal of Medicine and Health Sciences*, *2*(2), 96. https://doi.org/10.4314/rjmhs.v2i2.4
8. Hedstrom, A., Mubiri, P., Nyonyintono, J., Nakakande, J., Magnusson, B., Vaughan, M., Waiswa, P., & Batra, M. (2021). Impact of the early COVID-19 pandemic on outcomes in a rural Ugandan neonatal unit: A retrospective cohort study. *PLoS ONE*, *16*(12 December). https://doi.org/10.1371/journal.pone.0260006.
9. Muhumuza amos. (2014). The prevalence of birth asphyxia and immediate outcomes among pregnant women attending maternal health services at Ishaka Adventist Hospital. By Muhumuza Amos Reg No: BMS/ 0100/ 113 /du a dissertation submitted to the faculty of clinical medicine and dentistry in partial fulfillment of the requirements for the award of the bachelors degree in medicine and surgery of kampala international university.
10. Arach, A. A. O., Tumwine, J. K., Nakasujja, N., Ndeezi, G., Kiguli, J., Mukunya, D., Odongkara, B., Achora, V., Tongun, J. B., Musaba, M. W., Napyo, A., Tylleskar, T., & Nankabirwa, V. (2021). Perinatal death in Northern Uganda: incidence and risk factors in a community-based prospective cohort study. *Global Health Action*, *14*(1). https://doi.org/10.1080/16549716.2020.1859823.
11. Fernandes, V., Moura, M., Moreira, A., & Oliveira, T. (2020). Risk factors for perinatal asphyxia in newborns attended at a tertiary public maternity hospital. *Residência Pediátrica*, *10*(2). https://doi.org/10.25060/residpediatr-2020.v10n2-56.
12. Komakech, A., Migamba, S. M., Nakamya, P., Juniour, E. N., Morukileng, J., Aceng, F., Mutumba, R., Bulage, L., Kwesiga, B., & Ario, A. R. (2022). Trends and distribution of birth asphyxia, Uganda, 2017-2020: a retrospective Analysis of Public Health Surveillance Data. In *Quarterly Epidemiological Bulletin.*
13. Bayih, W. A., Birhane, B. M., Belay, D. M., Ayalew, M. Y., Yitbarek, G. Y., Workie, H. M., Tassew, M. A., Kebede, S. D., Alemu, A. Y., Gedefaw, G., Demis, A., & Chanie, E. S. (2021). The State of Birth Asphyxia in Ethiopia: An Umbrella Review of Systematic Review and Meta-Analysis Reports, 2020. *Heliyon*, *7*(10). https://doi.org/10.1016/j.heliyon.2021.e08128.
14. Woday, A., Muluneh, A., & St Denis, C. (2019). Birth asphyxia and its associated factors among newborns in public hospital, northeast Amhara, Ethiopia. *PLoS ONE*, *14*(12). https://doi.org/10.1371/journal.pone.0226891.

OPEN ACCESS
ONLINE ISSN: 2992-5797
PRINT ISSN: 2992-6122

15. MoH; Maternal Perinatal Death Surveillance and Response (MPDSR) Report, 2020/21.
16. Desalew Assefa, Semahgan Agumasie, & Tesfaye Gezahegn. (2020). *Determinants of birth asphyxia among newborns in Ethiopia: A systematic review and meta-analysis*. http://www.crd.york.ac.uk/PROSPERO/display.
17. Kune, G., Oljira, H., Wakgari, N., Zerihun, E., & Aboma, M. (2021). Determinants of birth asphyxia among newborns delivered in public hospitals of West Shoa Zone, Central Ethiopia: A casecontrol study. *PLoS ONE*, *16*(3 March). https://doi.org/10.1371/journal.pone.0248504.
18. Abose, S., Nuramo, A., Brehane, M., Lemma, L., Ahemed, R., & Gebrehiwot, H. (2022). The prevalence and associated factors of birth asphyxia among neonates delivered in Public Hospitals, Northern Ethiopia. *African Health Sciences*, *22*(2), 518–525. https://doi.org/10.4314/ahs.v22i2.60.
19. Tasew, H., Zemicheal, M., Teklay, G., Mariye, T., & Ayele, E. (2018). Risk factors of birth asphyxia among newborns in public hospitals of Central Zone, Tigray, Ethiopia 2018. *BMC Research Notes*, *11*(1). https://doi.org/10.1186/s13104-018-3611-3.
20. Meshesha, A. D., Azage, M., Worku, E., & Bogale, G. G. (2020). Determinants of Birth Asphyxia Among Newborns in Referral Hospitals of Amhara National Regional State, Ethiopia . *Pediatric Health, Medicine and Therapeutics*, *Volume 11*, 1–12. https://doi.org/10.2147/phmt.s229227.
21. Hussein, OA, Joy,M and Musiime, JN (2022).Evaluation of the factors associated with immediate adverse maternal outcomes among referred women in labor at Kampala International University Teaching Hospital.IAA Journal of Biological Sciences 8 (1), 228-238.
22. Musasizi,E.(2023).Factors influencing utilization of traditional birth attendants by mothers in Mafubira Sub-county, Jinja District. *NEWPORT INTERNATIONAL JOURNAL OF PUBLIC HEALTH AND PHARMACY* 3 (2), 12-19.
23. Rachel,A.(2023)Factors affecting Postoperative Recovery in Fort Portal Regional Referral Hospital, Uganda. *NEWPORT INTERNATIONAL JOURNAL OF RESEARCH IN MEDICAL SCIENCES* ,3 (1), 112-117

Etenu Jeremiah (2023). **Prevalence and Factors Associated with Birth Asphyxia among Newborns in Fort Portal Regional Referral Hospital Kabarole District Western Uganda. NEWPORT INTERNATIONAL JOURNAL OF BIOLOGICAL AND APPLIED SCIENCES (NIJBAS) 3(2):10-17.**