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FACTORS ASSOCIATED WITH NEONATAL SEPSIS AMONG NEONATES AT KISENYI HEALTH CENTRE IV IN KAMPALA DISTRICT. A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background

Neonatal sepsis is a systemic bacterial illness that affects neonates under the age of 28 days with or without bacteremia and in Uganda, 18.2% of the 19 per 1000 neonataldeaths are contributed by neonatal sepsis affecting the progress in improving maternaland child health. The purpose of the study was to determine the factors associated with neonatal sepsis among neonates in Kisenyi Health Centre IV, Kampala District.

Methods

The study used a descriptive cross-sectional study design that used quantitative data collection methods. A simple random sampling method was used to select 40 respondents. Data was analyzed and presented using Microsoft Excel 2013 that presented it in the form of frequency tables, pie charts, and graphs.

Findings

The findings of the study on maternal factors associated with neonatal sepsis were; that 70% had never attended antenatal care, 80% had untreated UTI during pregnancy and 60% had bathed the baby with herbs. Neonate-related factors included; 60% hadbabies born before 8 months and 70% had second to fifth order. Health facility–related factors; 60% had more than three vaginal examinations, 70% had not received antibiotics before delivery and 90% reported that wards were congested.

Conclusion

The study concluded that factors associated with neonatal sepsis were maternal factors,neonate-related, and health facility-related factors. Therefore, health education on appropriate neonatal care practices and adjustment of the quality of maternal and neonatal care practices should be done to reduce incidences of neonatal sepsis.

Recommendations

Ministry of Health should offer refresher training to health workers regarding the management of mothers in labor like avoiding unnecessary vaginal examinations. Furthermore, antibiotics should be supplied to health facilities toensure routine provision among neonates.

Keywords: *Neonatal, Sepsis, Kisenyi Health Centre IV, Kampala District*
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Background of the Study

Globally, neonatal sepsis is one of the common causes of morbidity and mortality during the neonatal period accounting for 15% of deaths, and in developed countries, the incidence of neonatal sepsis varies from one to four cases per 1,000 live births, (Shifera, Dejenie, Mesafint & Yosef, 2023). It is a composite of six systemic infections namely septicemia, pneumonia, meningitis, osteomyelitis, arthritis, and urinary tract infections, (Bayih et al, 2021). South Asian hospitals record one of the highest incidences of neonatal sepsis 15.8 per 1000 live births which is 2 – 4 times higher than the rates reported in the United Kingdom and the United States, (Li, Shen & Qian, 2023). Despite improvements in the diagnosis and management, neonatal sepsis has become a leading cause of admission and death in neonatal units, especially in developing countries, due to socio-demographic, maternal, and neonatal conditions. Identification of bacteria and treatment is often unsatisfactory due to the nonspecific clinical presentation of sepsis and the lack of rapid diagnostic tests. These commonly occur among low-income countries such as Bangladeshwith low education status who are deficiency in knowledge on neonatal care practices (Etafa et al, 2022)

In Africa, neonatal sepsis accounts22% of neonatal infections of which 57% areattributed to gram-positive microorganisms (Blumenroder et al, 2023). In some countries like South Africa, LOS is predominant (86.8%) over EOS (13.2%) with most of the infections occurring after hospital discharge (Pillay, Naidoo, Swe–Han &

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Mahabeer, 2021). In addition, the incidence of neonatal sepsis varies from 17.0 to 29.0% with the highest cases registered recorded Democratic Republic of Congo (DRC) and Nigeria, (Ranjeva et al, 2018). The most reportedrisk factors are prolonged labor, the premature rupture of membranes, multiple digital vaginal examinations, and preterm births (Bech et al, 2020). Such cases result from poor healthcare-seeking behaviors that hinder early detection of maternal complications like prolonged labor hence predisposing them to neonatalsepsis, (Agnche et al, 2020).

The East African region has a pooled prevalence of neonatal sepsis of 29.65% (Abate, Kasie, Reta & Kassaw, 2020). Specifically, neonatal sepsis affects 34.1% of neonates in Tanzania and 29.3% in Kenya due to preventable causes such asmultiple vaginal examinations, untreated urinary tract infections (UTIs), and delays in seeking health care (Okube & Komen, 2020). About the above,failure of health facilities to offer sterile services, and poor knowledge of newborncare also contributes to these infections, (Okube & Komen, 2020).

In Uganda, the incidence of neonatal sepsis is 17.4 per 1,000 live births with thehighest incidences at regional referral hospitals (68/1000 live births) and lowestat health center II level (1.3/1000 live -births), (Migamba et al, 2022). The lackof laboratory facilities, medical supplies, inequities in service provision, and inadequate health care funding are some of the health facilities rupture of membranes for more than 24 hours, and prolonged labor and living in poor environmental conditions have an increased risk of acquiring or developing Sepsis, (John, David, Mathias & Nabiwemba, 2015). The problem of neonatal sepsis hasn't been tackled well enough hence the reason am taking up this studyto identify factors associated with neonatal sepsis in Kisenyi Health Centre IV,Kampala District.

The study aimed to determine the factors associated with neonatalsepsis among neonates in Kisenyi Health Centre IV, Kampala District.

METHODOLOGY

Study design and rationale

The study employed a descriptive cross-sectional design that involved quantitative methods of data collection. The study used a cross–sectional studydesign because it was cheap and time-saving to use. Quantitative data collection methods were used to collect data that was expressed in numerical forms.

Study setting and rationale

The study was facility-based based was conducted at Kisenyi Health Centre IV a Kampala City Council Authority (KCCA) health centre located in the central division of Kampala district in central Uganda 4.4km south of Mulago NationalReferral Hospital. It is located in the Kisenyi slum area, Kampala Central division,Kampala district. The health center operates an outpatient medical clinic, family planning clinic, maternity services, immunization services, in-patient services, and HIV clinic. The health center management has constantly complained that the post-natal clinic receives about 40 mothers per day who come back for review with their babies. There's also a postnatal ward where mothers who have delivered stay for at least 24 hours before discharge. The clinic can have three certificate holder Midwives and one diploma holder Midwife with a medical officer. The clinic works from 8:00 am to 5:00 pm only during weekly days. Some of the services offered include postnatal examination of the mothers and neonates, refilling of antibiotics, and health education.

Study population

The study population was postnatal mothers having neonates suffering from neonatal sepsis.

Sample size determination

The sample size was estimated using Barton's formula (1990) below.

n=DN/T

Where: **D**- Total number of days the data was collected, **Total** number ofrespondents given a questionnaire per day, **T**- The maximum time the interview took place.

Hence: D will be 5 days, N will be 8, T was 1 hour

Therefore; n= (5*8)/1, n=40. A sample of 40 respondents was used.

Sampling procedure

The study used a simple random sampling technique. This technique was chosenfor this study because it ensures that the sample is representative of the studypopulation as well as reduces bias in the sample. To obtain the participants, the researcher made 80 pieces of similar size 40 were written on ***Q,*** and the rest

P. Eligible mothers picked a single paper at random. Those who picked papers with the word ***Q*** were enrolled in the study.

Inclusion criteria

All participants were postnatal mothers aged 15 years and above, who are Ugandans having neonates suffering from sepsis and consented to participate inthe study.

Exclusion Criteria

The study did not include very sick caretakers and those with mental illness.

Independent variables

Maternal factors, neonate-related factors, and health facility factors

Dependent variable

This was neonatal sepsis.

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Research Instrument

A structured questionnaire was used to obtain data from the respondents. These were divided into three parts; socio–demographic characteristics, maternal factors, neonate-related factors, and health facility factors. The questions were both open-ended and closed-ended. The tool was pretested at KawaalaHealth Centre IV to assess its accuracy, consistency, and reliability with necessary adjustments and collections were made.

Data Collection Procedures

The researcher first had an informal pilot visit to the study area three days before the data collection day. Before data collection, authorization to conduct the study at the facility was sought from the health center management. Once givenpermission, an explanation about the study was done and consent forms were signed. Data collection was done using a researcher-administered questionnaire involving the respondents' questions as she filled in the responses given. This was done for five days involving eight respondents on each day of data collection.

Data Management

To ensure the quality and safety of the collected data, the questionnaires were first checked for completion, collection of mistakes, and editing on each of the days to avoid missing information after losing contact with the respondent, these were put and sealed in an envelope kept on a lockable shelf only accessible to the researcher. Soft copies were protected with a personal password known by the researcher only.

Data Analysis and presentation

Analysis was initially done manually by tallying and coding and the summary of the findings was entered into the computer using Microsoft Excel. This presented the data in frequency tables, figures, graphs, and charts.

Ethical considerations

The proposal was presented to the Mildmay School of Nursing and Midwifery for approval. The principal gave the researcher an introductory letter to seek permission from Kisenyi Health Centre IV seeking for administrative clearance. The study began with the researcher introducing and explaining the topic and objectives to respondents. Informed consent was obtained from all the study respondents, and confidentiality was ensured throughout as respondents were not allowed to write their names on the questionnaire. Filled questionnaires were kept safe by the researcher.

Limitations of the study

Resistance from respondents to participate in the study was encountered. This was addressed by explaining the importance of the study and assurance will begiven for their information protection.

Financial constraints due to variations in logistics prices like printing are needed in the study. However, this was overcome by soliciting some resources and affordable planned expenditures.

FINDINGS

Demographic characteristics of respondents

Most of the respondents 21(42.5%) were aged 35 – 49 years while the least 8(20%) were aged 15 – 24 years. The majority of the respondents 31(77.5%) were married while the minority 4(10%) were single. Most of the respondents 16(40%) had attained secondary education level while the least 5(12.5%) had ever goneto school. Most of the respondents 15(37.5%) were housewives while the least6(15%) were self – employed as presented in Table 1.

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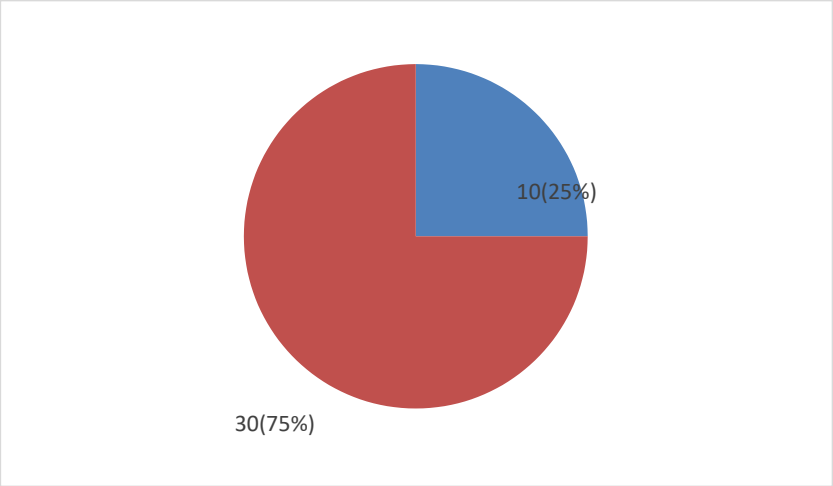
Table 1: Showing demographic characteristics of respondents(n = 40)

Variable	Category	Frequency (f)	Percentage (%)
Age	15 – 24 years	8	20
	25 – 34 years	11	27.5
	35 – 49 years	21	42.5
Marital status	Single	5	12.5
	Married	31	77.5
	Divorced	4	10
Level of education	No school attended	5	12.5
	Primary level	11	27.5
	Secondary level	16	40
	Tertiary level	8	20
Occupation	Self-employed	6	15
	Civil servant	12	30
	Peasant farmer	7	17.5
	House wife	15	37.5

Prevalence of Neonatal Sepsis among research participants

About 30(75%) had neonates with sepsis while 10(25%) never had sepsis.Results are presented in Figure 1.

Figure 1: A pie chart showing the presence of neonatal sepsis in the new-borns (n = 40)



Maternal–related factors associated with neonatal sepsis

In Table 2, among mothers who had children with neonatal sepsis (n = 10), the majority 7(70%) had never attended antenatal care while the minority 1(10%) had attended more than four antenatal visits. Most 4(40%) did not have any monthly income while the least 1(10%) earned more than 450,000 per month. Half 5(50%) experienced hardship in purchasing the baby requirements

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while only 1(10%) never experienced hardships. The majority 8(80%) had a history of STIduring pregnancy while the minority 2(20%) never had STI during pregnancy. Half 5(50%) reported that membranes took longer to rapture while only 2(20%) reported that membranes raptured while they were still at home. The majority 6(60%) used herbs to bathe the baby while the minority 1(10%) used clean waterand detergent.

Table 2: Maternal–related factors associated with neonatal sepsis.

Variable	Response	Has neonatal sepsis (n = 10)		No neonatal sepsis (n = 30)	
		f	%	f	%
Number of antenatal visits	None	7	70	14	46.7
	Less than 4 visits	2	20	11	36.7
	More than 4 visits	1	10	3	10
Monthly income	None	4	40	10	33.3
	Less than 150,000/-	3	30	13	43.3
	150,001 – 450,000/-	2	20	4	13.4
	>450,000/-	1	10	3	10
Hardships in purchasing the babyrequirements	Always	5	50	14	46.7
	Sometimes	4	40	15	40
	Never	1	10	1	3.3
STI rupture during Pregnancy	Yes	8	80	11	36.7
	No	2	20	19	63.3
Time of rupture ofmembranes	While sitting at home	2	20	13	43.3
	Immediately on hospital admission	3	30	12	40
	After a long time after admission	5	50	5	16.7
The material used to bath the baby	Herbs	6	60	4	13.3
	Clean water	3	30	8	26.7
	Clean water with detergent	1	10	18	60

Neonate–related factors associated with neonatal sepsis among neonates

According to Table 3 out of the 10 mothers with children suffering from neonatal sepsis, most 6(60%) gave birth before 8 months while the least 4(40%) gave birth after 8 months. Half 5(50%) gave birth to children weighing 1501 – 2500g while a few 2(20%) reported below 1500g birth weight. The majority 7(70%) had second to fifth-born children while the minority 1(10%) had first-born children. The majority 8(80%) had given birth by vaginal delivery while the minority 2(20%) had given birth by cesarean section. Most 9(90%) reported that the baby cried immediately after birth while the least 1(10%) did not cry immediately.

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Table 3: Neonate–related factors associated with neonatal sepsis amongneonates

Variable	Response	Has neonatal sepsis (n = 10)		No neonatal sepsis (n = 30)	
		f	%	f	%
Gestation age at Birth	Before 8 months	6	60	7	23.3
	After 8 months	4	40	23	76.7
Birth weight	<1500g	2	20	4	13.3
	1501 – 2500g	5	50	11	36.7
	>2500g	3	30	15	50
Birth order	First	1	10	11	36.7
	Second to fifth	7	70	12	40
	Sixth and above	2	20	7	23.3
Mode of birth	Vaginal	8	80	14	46.7
	Cesarean delivery	facility–related	20	16	53.3
Crying of the baby immediately afterbirth	Yes	9	90	18	60
	No	1	10	12	40

Health facility – related factors associated with neonatal sepsisamong neonates

Table 4 shows that out of the mothers with children suffering from neonatal sepsis, themajority 6(60%) had received more than 3 vaginal examinations while the minority1(10%) had received many vaginal examinations they could not remember. Most 7(70%) received antibiotics only after delivery while the least 1(10%) received them before delivery. The majority 9(90%) reported that the unit was congestedwhile the minority 1(10%) reported that it was spaced. Half 5(50%) had not received any invasive procedure performed on the child while only 1(10%) hadfeeding tube insertion.

Table 4: Health facility–related factors associated with neonatal sepsisamong neonates

Variable	Response	Has neonatal sepsis (n = 10)		No neonatal sepsis (n = 30)	
		f	%	f	%
the Number of vaginal examinations performed	<3	3	30	20	66.7
	>3	6	60	7	23.3
	Too many to remember	1	10	3	10
Time of receivingantibiotics	Before delivery	1	10	15	50
	After delivery	7	70	11	36.7
	receive	2	20	4	13.3
Description of spacing at the unit	Spaced	1	10	3	10
	Congested	9	90	27	90
Invasive procedures performed on the child	Feeding tube insertion	1	10	2	6.7
	Cannulation	3	30	5	1.7
	Oxygen therapy	1	10	4	13.3
	None	5	50	19	63.3

Discussion

Demographic characteristics

The study results revealed that, most of the respondents (42.5%) were aged 35 - 49 years. This could be because older mothers often use traditional practices of newborn care which put their neonates at risk of neonatal sepsis. This disagrees with a study by John et al, (2015) which revealed that mothers of a lower age group 23.5% had their neonates affected by sepsis.

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Most of the respondents (40%) had attained a secondary education level. This could be because mothers with secondary education often do not comply with medical advice since they receive information from other sources such as the Internet which could be incorrect. This is contrary to a study by Kayom et al, (2018) who revealed that mothers with primary education levels (45.7%) were significantly associated with neonatal sepsis.

Maternal–related factors associated with neonatal sepsis

According to study findings, the majority (70%) of neonatal sepsis cases were among mothers who never attended antenatal. This might be because mothers who miss antenatal care lack the opportunity to learn about the recommended neonatal care practices for the prevention of neonatal sepsis. This agrees with a study by Roble et al, (2022) which revealed that 41.9% of children with neonatal sepsis were born to mothers who did not attend antenatal care.

Study results revealed that half (50%) of mothers who experienced hardships in purchasing a baby's requirements were suffering from neonatal sepsis. This could be because mothers who lack recommended materials resort to improvision with unsafe materials that predispose their neonates to sepsis. This agrees with a study by Olorukooba et al, (2020) which revealed41.9% of unemployed mothers had suffered from neonatal sepsis because they experienced hardships in purchasing the baby's requirements

Furthermore, out of 10 mothers with neonates suffering from sepsis, the majority (80%) had a history of untreated STI during pregnancy. This probably transmitted the infections to the neonates during the late stages of pregnancy or childbirth. Similarly, a study by Tumuhamye et al, (2020) found that a history of urogenital infections characterized by foul-smelling vaginal discharge was significantly associated with neonatal sepsis. In addition, a study by Adatara et al, (2019) revealed that a positive history of untreated STDs during pregnancy most especially third trimester among 39% was associated with the occurrence of neonatal sepsis.

The study results revealed that most (60%) of mothers who had used herbs to bath their children were classified to have neonatal sepsis. This could be because herb medicines are impure with microorganisms that cause neonatal sepsis in the neonate. The findings are in agreement with a study by Agnche et al, (2022) who revealed that mothers who had bathed their babies with herbs were associated with neonatal sepsis.

Neonate–related factors associated with neonatal sepsis amongneonates

The findings of the study revealed that most (60%) of babies born before 8 monthshad developed sepsis. This might be because of an immature immune system coupled with fragile skin that can easily permit the entry of microorganisms. In support of the findings, a study by El–Din et al, (2015) revealed that 58.9% ofneonates with sepsis were preterm babies in comparison to term infants. In addition, a study by Birrie et al, (2022) conducted in Ethiopia found that 90% of preterm babies (<37 weeks) were associated with the occurrence of neonatalsepsis.

According to study findings, the majority (70%) of children with neonatal sepsis were second to fifth-order. This was probably because multigravida mothers regard themselves as experienced in newborn care thereby not following medical advice leading to neonatal sepsis. On the contrary, a study by Murthy et al (2019) explored that larger birth orders exceeding the fifth birth order were associated with the occurrence of neonatal sepsis.

Study results revealed that the majority (80%) of babies with neonatal sepsis were born by vaginal delivery. This was due to exposure to a vaginal environment thatmight have contained microorganisms associated with neonatal sepsis. The findings are in line with a study by Roble et al (2022) in the Somali Region found that 52.3% of neonates who developed sepsis were born by vaginal delivery.On the contrary, a study by Alcocer et al, (2020) found that 52.74% of the neonates born by cesarean section had developed sepsis

Health facility–related factors associated with neonatal sepsisamong neonates

The study results revealed that the majority (60%) of mothers with childrensuffering from neonatal sepsis had received more than 3 vaginal examinations. This was probably because multiple vaginal examinations might be unsterile introducing microorganisms into the birth canal leading to neonatal sepsis. The findings are in agreement with a study by Shifera et al, (2023) conducted in Ethiopia found out that mothers who received more than three vaginal examinations (36.4%) had their neonates develop neonatal sepsis. Morestill,a study by Nyma et al, (2020) revealed mothers 50% had single unclear or >3 sterile vaginal examinations during labor had neonates with sepsis.

The findings of the study revealed that the majority (70%) of mothers with children suffering from neonatal sepsis had not received antibiotics before delivery. Thiscould indicate that mothers did not receive an antibiotic cover before birth hence existing bacteria were not eliminated before childbirth. This agrees with a studyby Rafi et al, (2020) done in Bangladesh revealed malpractices in antibiotic administration such as the absence of pre–labor prophylaxis influenced the existenceof neonatal sepsis.

According to study findings, the majority (90%) reported that the ward was congested.This probably led to cross-infection since patients are close to one another leading to neonatal sepsis. In line with the findings, a study by Milton et al, (2022) found that congestion at healthcare facilities was associated with neonatal sepsis.

Conclusion

Factors associated with neonatal sepsis were maternal factors, neonate-related, andhealth facility-related factors. Maternal factors associated with neonatal sepsis were non–enatal attendance, financial hardships, STIs during pregnancy, and use of herbs during childbirth. Neonate–related factors were prematurity,birth order, and vaginal delivery were associated with neonatal sepsis. Health facility–related factors associated with neonatal sepsis were multiple vaginal examinations, absence of antibiotic administration, and congested wards.

Recommendations

Ministry of Health should offer refresher training to health workers regarding the management of mothers in labor like avoiding unnecessary vaginal examinations. Furthermore, antibiotics should be supplied to health facilities toensure routine provision among neonates.

Management of KCCA should expand the size of the postnatal wards to relievecongestion at the health facility to reduce potential cross-infection.

Kisenyi Health Centre IV should conduct support supervision of midwives during labor to encourage midwives to administer antibiotics appropriately to prevent infections.

Midwives should adhere to standard midwifery practice of health education of mothers on the prevention of neonatal sepsis as well as avoid unnecessary vaginal examinations.

Mothers should avoid bathing their babies with herbs hence avoid such infections. Furthermore, mothers should attend antenatal care routinely toenable them to acquire appropriate knowledge about the prevention of neonatal sepsis.

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Abbreviations and Acronyms

DRC: Democratic Republic of Congo

EOS: Early Onset Sepsis

HMIS: Health Management Information System

LOS: Late-Onset Sepsis

MOH: Ministry of Health

UTI: Urinary Tract Infections

STIs: Sexually Transmitted Infections

UNICEF: United Nations Children's Fund

UNMEB: Uganda Nurses and Midwives Examination Board

WHO: World Health Organization

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No source of funding.

Conflict of interest

No conflict of interest.

References

1) Abate, B.B., Kasie, A.M., Reta, M.A. & Kassaw, M.W., (2020). Neonatal sepsisand its associated factors in East Africa: A Systematic Review and metaanalysis. *International Journal of Public Health, 65*:1623 – 1633
2) Adatara, P., Afaya, A., Salia, S.M., Afaya, R.O., Konlan, K.D., Agyabeng – Fandoh, E., Agbinku, E., …, Boahene, I.G., (2019). Risk factors associated with neonatal sepsis: A case study at a specialist hospital in Ghana. *Scientific World Journal, 2019:* 9369051
3) Agnche, Z., Yeshita, H.Y. & Gonete, K.A., (2020). Neonatal sepsis and its associated factors among neonates admitted to Neonatal Intensive Care Units in Primary hospitals in central Gondar zone, Northwest Ethiopia,2019
4) Alcocer, B.S., Canche, B.A., Ortegon, L.M.M, Balan, R.A.P., Keb, A.C. et al, (2020). Risk factors of neonatal sepsis. *International Journal of Advanced Research, 8*(12):508 – 514
5) Andarge, E., Nigussie, A. & Wondafrash, M., (2017). Factors associated with birth preparedness and complication readiness in South Ethiopia: A community-based cross-sectional study. *BMC Pregnancy and Childbirth, 17*:412
6) Bayih, W.A., Ayalew, M.Y., Chanie, E.S., Abate, B.B., Alemayehu, S.A.,Belay, D.M., Aynalem, Y.A., …, Alemu, A.Y., (2021). The burden of neonatal sepsis and its association with antenatal urinary tract infectionsand intrapartum fever among admitted neonates in Ethiopia: A Systematic Review and Meta–Analysis. *Heliyon, 7*(2): e06121

7) Bech, C.M., Stensgaard, C.N., Lund, S., Holm – Hansen, C., Brok, J.S., …, Poulsen, A., (2020). Risk factors for neonatal sepsis in Sub Saharan Africa: A systematic review with meta–analysis. *BMJ Open, 12*(9).
8) Birrie, E., Sisay, E., Tibebu, N.S., Tefera, B.D., Zeleke, M. & Tefera, Z., (2022).Neonatal sepsis and associated factors among newborns in Woldia and Dessie Comprehensive specialized hospitals, Northeast Ethiopia, 2021. *Infection and Drug Resistance, 15*:4169 – 4179
9) Blumenroder, S., Wilson, D., Ndaboine, E., Mirambo, M.M., Mushi, M.F., Bader, P., …, Grob, U., (2023). Neonatal infection in Sub Saharan Africa: A cross-sectional Pilot study on bacterial pathogens and maternal risk factors. *Front Microbiol, 14*(11).
10) El – Din, E.M.R.S., El -Sokkary , M.M.A., Bassiouny, M.R. & Hassan, R., (2015). Epidemiology of neonatal sepsis and implicated pathogens: A study from Egypt. *Biomed res int, 15*:509484
11) Etafa, w., fetensa, g., tsegayem, r., wakuma, b., Sundararajan, v., bayisa, g. & Turi, e., (2022). Neonatal sepsis risk factors in public hospitals in Wollega zones, Ethiopia: A case-control study. *PAMJ One Health, 7*(2).
12) John, B., David, M., Mathias, L. & Nabiwemba, E., (2015). Risk factors and practices contributing to newborn sepsis in a rural district of Eastern Uganda, August 2013: A cross-sectional study. *BMC research notes, 8*(339)
13) Kayom, V.O., Mugalu, J., Kakuro, A., Kiguli, S. & Karamagi, C., (2018). Burden and factors associated with clinical neonatal sepsis in urban Uganda: A community Cohort Study. *BMC Pediatrics, 18*(355).
14) Li, J., Shen, L. & Qian, K., (2023). Global regional and national and mortality of neonatal sepsis and other neonatal infections, 1990 – 2019. *Front Public Health, 11*(14).
15) Migamba, S.M., Kisaakye, E., Nakanwagi, M., Komakech, A., Nakamya, P., Kwesiga, B., …, Ario, A.R., (2022). Trends and spatial distribution of neonatal sepsis Uganda, 2016 – 2020. Uganda National Institute of Public Health
16) Milton, R., Gillespie, D., Dyer, C., Taiyari, K., Carvalho, M.J. & Thomson, K.,(2022). Neonatal sepsis and mortality in low–income and middle–income countries from a facility–based cohort: An international l multisite prospective observational study. *The Lancet Global Health, 10*(5):E661 – E672
17) Murthy S., Godinho M.A., Guddattu V., Lewis L.E.S. & Nair N.S., (2019) Risk factors of neonatal sepsis in India: A systematic review and meta-analysis. PLoS ONE 14(4): E0215683.
18) Nyma, Z., Rahman, M., Mehedi, S.M., Roby, N.U., Khanam, F., Alam, E. & Ali, M., (2020). Prevalence and associated risk factors of sepsis among neonates admitted into neonatal intensive care units of Public Hospitals in Dhaka. *Cureus,*
19) Okube, O. and Komen, M. (2020) Prevalence and Predictors of Neonatal Sepsis among Neonates Admitted at the Newborn Unit of Kenyatta National Hospital, Nairobi, Kenya. *Open Journal of Obstetrics and Gynecology*,**10**, 1216-1232.
20) Okube, O.T. & Komen, M., (2020). Prevalence and predictors of neonatal sepsis among Neonates Admitted at the Newborn Unit of Kenyatta National Hospital, Nairobi Kenya. *OPEN Journal of Obstetrics and Gynecology, 10*(9).
21) Olorukooba, A.A., Ifusemu, W.R., Ibrahim, M.S., Jibril, M.B., Amadu, L., Lawal, B.B., (2020). Prevalence and factors associated with neonatal sepsis in a tertiary hospital, North West Nigeria. *Nigerian Medical Journal, 61*(2): 60 – 66
22) Pillay, D., Naidoo, Swe – Han, K. & Mahabeer, Y., (2021). Neonatal sepsis in a tertiary unit in South Africa. *BMC infectious diseases, 21*:225
23) Rafi, M.A., Miah, M.M.Z., Wadood, M.A. & Hossain, M.G., (2020). Risk factors and etiology of neonatal sepsis after hospital delivery: A case–control study in a tertiary care hospital of Rajshahi, Bangladesh. *PLOS ONE, 15*(11):e0242275
24) Ranjeva, S.L., Warf, B.C., Schiff, S.J., (2018). Economic burden of neonatal sepsis in Sub-Saharan Africa. *BMJ Glob Health, 3*:e000347
25) Ranjeva, S.L., Warf, B.C., Schiff, S.J., (2018). Economic burden of neonatal sepsis in Sub-Saharan Africa. *BMJ Glob Health, 3*:e000347
26) Roble, A.K., Ayehubizu, L.M. & Olad, H.M., (2022). Neonatal sepsis and associated factors among neonates admitted to neonatal intensive careunit in general hospitals. *SAGE Journals,*
27) Shifera, N., Dejenie, F., Mesafint, G. & Yosef, T., (2023). Risk factors for neonatal sepsis among neonates in the neonatal intensive care unit at Hawassa University Comprehensive Specialized Hospital and Adare General Hospital in Hawassa City, Ethiopia. *Front Pediatric, 11*(17).
28) Tumuhamye J, Sommerfelt H, Bwanga F, Ndeezi G, Mukunya D, Napyo A, (2020) Neonatal sepsis at Mulago national referral hospital in Uganda: Etiology, antimicrobial resistance, associated factors and case fatality risk. PLoS ONE 15(8): e0237085. https://doi.org/10.1371/journal.pone.0237085

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