Elite Journal of Health Sciences. Volume 2 issue 1(2024), Pp. 43-50
https://epjournals.com/journals/EJHS

Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective

*Emmanuel Ifeanyi Obeagu[1] and Getrude Uzoma Obeagu[2]

[1]Department of Medical Laboratory Science, Kampala International University, Uganda.
[2]School of Nursing Science, Kampala International University, Uganda.

*Corresponding authour: Emmanuel Ifeanyi Obeagu, Department of Medical Laboratory Science, Kampala International University, Uganda.

E-mail: emmanuelobeagu@yahoo.com, obeagu.emmanuel@kiu.ac.ug, 0000-0002-4538-0161

Abstract

Maternal malaria, a pervasive health challenge in malaria-endemic regions, extends its impact beyond immediate maternal and perinatal outcomes. This review explores the life course perspective of maternal malaria and its intricate influence on neonatal developmental outcomes. Through a comprehensive examination of existing literature, we scrutinize the association between maternal malaria and neurodevelopmental outcomes, cognitive function, immune system trajectories, and epigenetic modifications in offspring. Understanding the life course implications involves unraveling the complex interplay between maternal malaria exposure and developmental trajectories from prenatal stages to long-term consequences. Epigenetic modifications emerge as a crucial mechanism through which maternal malaria may imprint lasting effects on neonatal development. Analysis of DNA methylation, histone modifications, and non-coding RNA profiles provides a molecular lens into the life course consequences of maternal malaria. Examining long-term consequences informs discussions on intervention strategies, with a focus on antimalarial treatments, preventive measures, and public health initiatives. In conclusion, this review synthesizes current knowledge on the life course perspective of maternal malaria and neonatal developmental outcomes. It underscores the importance of a comprehensive understanding that spans prenatal to postnatal stages, identifying critical windows of vulnerability.

Keywords*: maternal malaria, neonatal developmental outcomes, life course*

Introduction

Maternal malaria, predominantly caused by Plasmodium falciparum, continues to pose a substantial public health challenge, particularly in regions where the disease is endemic. While

Citation: Obeagu EI, Obeagu GU. Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective. Elite Journal of Health Science, 2024; 2(1): 43-50

significant strides have been made in understanding the immediate consequences of maternal malaria on maternal and perinatal health, there is a growing recognition of its broader and lasting impact on neonatal developmental outcomes.[1-12] Malaria in pregnancy is associated with adverse outcomes such as maternal anemia, low birth weight, and preterm birth. Beyond these well-documented consequences, recent research has sought to unravel the potential long-term effects of maternal malaria exposure on the cognitive, immune, and epigenetic development of the neonate. By adopting a life course perspective, we aim to scrutinize the continuum of effects that extend from prenatal stages to childhood and, potentially, throughout the individual's lifespan.[13-22] The dynamics of maternal malaria involve intricate interactions between the maternal immune system, the developing fetus, and the Plasmodium parasite. Factors such as the timing of maternal infection, the host's immune response, and the placental environment contribute to the complexity of outcomes.[23-32]

Maternal Malaria and Neurodevelopment

Maternal malaria's impact extends beyond immediate health outcomes, with growing evidence suggesting potential implications for neurodevelopment in offspring. The placenta, a crucial interface in maternal-fetal interactions, becomes a battleground during malaria infection. Delving into the concept of critical periods in fetal development, we examine how the timing of maternal malaria exposure during pregnancy may influence the developing brain. Maternal malaria triggers robust inflammatory responses, and this heightened inflammation may have implications for the developing fetal brain. Cutting-edge neuroimaging techniques offer a glimpse into the structural and functional alterations in the brains of offspring exposed to maternal malaria. Despite the challenges posed by maternal malaria, certain mechanisms may confer neuroprotection to the developing fetal brain. Maternal malaria, a global health concern, is increasingly recognized for its potential to impact the cognitive outcomes of offspring. Education is a cornerstone of cognitive development, and we review research examining the potential association between maternal malaria exposure and subsequent educational attainment in offspring.[33-50]

Life course Perspectives on Immune Function

Maternal malaria not only poses immediate risks but also casts a long shadow over the life course immune function of offspring. Tracing the early stages of immune development, we explore how maternal malaria exposure may influence the neonatal immune system. The life course perspective extends into childhood, where we analyze the sustained impact of maternal malaria on the evolving immune responses of offspring. As individuals transition into adolescence, we explore whether the immune system exhibits resilience or retains vulnerabilities shaped by early-life exposure to maternal malaria. The life course perspective extends into adulthood, where we assess the lifelong consequences of maternal malaria on immune function. The impact of maternal malaria extends beyond immediate health outcomes, reaching the molecular level of the developing fetus. Maternal malaria during pregnancy has far-reaching consequences that extend beyond the immediate perinatal period.[51-65]

Citation: Obeagu EI, Obeagu GU. Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective. Elite Journal of Health Science, 2024; 2(1): 43-50

Conclusion

Maternal malaria, a complex and persistent global health challenge, extends its influence far beyond the immediate perinatal period, leaving lasting imprints on the life course of both mothers and their offspring. This comprehensive review has navigated through the intricate interplay of various factors influencing the life course trajectories associated with maternal malaria exposure. Maternal malaria leaves a multifaceted impact on the life course of offspring, influencing neurodevelopment, cognitive outcomes, immune function, and potentially extending into adulthood. Understanding these diverse consequences is essential for designing targeted interventions. The life course impact of maternal malaria is intricately woven into the fabric of socioeconomic disparities and environmental determinants. Disparities in healthcare access, educational opportunities, and environmental factors contribute to differential outcomes, necessitating a comprehensive approach.

References

1. Obeagu EI, Obeagu GU, Chukwueze CM, Ikpenwa JN, Ramos GF. Evaluation Of Protein C, Protein S and Fibrinogen of Pregnant Women with Malaria in Owerri Metropolis. Madonna University journal of Medicine and Health Sciences ISSN: 2814-3035. 2022;2(2):1-9.
2. Obeagu EI, Ibeh NC, Nwobodo HA, Ochei KC, Iwegbulam CP. Haematological indices of malaria patients coinfected with HIV in Umuahia. Int. J. Curr. Res. Med. Sci. 2017;3(5):100-104.
3. Opeyemi AA, Obeagu EI. Regulations of malaria in children with human immunodeficiency virus infection: A review. Medicine. 2023;102(46): e36166.
4. Obeagu EI, Chijioke UO, Ekelozie IS. Malaria rapid diagnostic test (RDTs). Ann Clin Lab Res. 2018;6(4):275.
5. Obeagu EI, Alum EU, Ugwu OP. Hepcidin: The Gatekeeper of Iron in Malaria Resistance. 2023.
6. Ogomaka IA, Obeagu EI. Methods of Breast Feeding as Determinants of Malaria Infections among Babies in IMO State, Nigeria. International Journal of Medical Science and Dental Research. 2019;2(01):17-24.
7. Obeagu EI, Obeagu GU, Egba SI, Emeka-Obi OR. Combatting Anemia in Pediatric Malaria: Effective Management Strategies. Int. J. Curr. Res. Med. Sci. 2023;9(11):1-7.
8. Obeagu EI, Agreen FC. Anaemia among pregnant women: A review of African pregnant teenagers. J Pub Health Nutri. 2023; 6 (1). 2023;138. links/63da799664fc860638054562/Anaemia-among-pregnant-women-A-review-of-African-pregnant-teenagers.pdf.
9. Obeagu EI, Ezimah AC, Obeagu GU. Erythropoietin in the anaemias of pregnancy: a review. Int J Curr Res Chem Pharm Sci. 2016;3(3):10-8. links/5710fae108ae846f4ef05afb/ERYTHROPOIETIN-IN-THE-ANAEMIAS-OF-PREGNANCY-A-REVIEW.pdf.

Citation: Obeagu EI, Obeagu GU. Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective. Elite Journal of Health Science, 2024; 2(1): 43-50

10. Obeagu EI, Adepoju OJ, Okafor CJ, Obeagu GU, Ibekwe AM, Okpala PU, Agu CC. Assessment of Haematological Changes in Pregnant Women of Ido, Ondo State, Nigeria. J Res Med Dent Sci. 2021;9(4):145-8. links/608a6728a6fdccaebdf52d94/Assessment-of-Haematological-Changes-in-Pregnant-Women-of-Ido-Ondo.pdf.
11. Obeagu EI, Obeagu GU. Sickle Cell Anaemia in Pregnancy: A Review. International Research in Medical and Health Sciences. 2023;6(2):10-3. http://irmhs.com/index.php/irmhs/article/view/111.
12. Jakheng SP, Obeagu EI. Seroprevalence of human immunodeficiency virus based on demographic and risk factors among pregnant women attending clinics in Zaria Metropolis, Nigeria. J Pub Health Nutri. 2022; 5 (8). 2022;137. links/6317a6b1acd814437f0ad268/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf.
13. Hassan AO, Oso OV, Obeagu EI, Adeyemo AT. Malaria Vaccine: Prospects and Challenges. Madonna University journal of Medicine and Health Sciences. 2022;2(2):22-40.
14. Obeagu EI, Ogbonna US, Nwachukwu AC, Ochiabuto O, Enweani IB, Ezeoru VC. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. Journal of Pharmaceutical Research International. 2021;33(4):10-9.
15. Obeagu EI, Busari AI, Uduchi IO, Ogomaka IA, Ibekwe AM, Vincent CC, Chijioke UO, Okafor CJ, Okoroiwu HU, Adike CN. Age-Related Haematological Variations in Patients with Asymptomatic Malaria in Akure, Ondo State, Nigeria. Journal of Pharmaceutical Research International. 2021;33(42B):218-24.
16. Ogomaka IA, Obeagu EI. Malaria in Pregnancy Amidst Possession of Insecticide Treated Bed Nets (ITNs) in Orlu LGA of Imo State, Nigeria. Journal of Pharmaceutical Research International. 2021;33(41B):380-6.
17. Ogbonna CO, Obeagu EI, Ufelle SA, Ogbonna LN. Evaluation of haematological alterations in children infected by Plasmodium falciparum Species in Enugu, Enugu State, Nigeria. Journal of Pharmaceutical Research International. 2021;33(1):38-45.
18. Obeagu EI, Obeagu GU, Chukwueze CM, Ikpenwa JN, Ramos GF. Evaluation of Protein C, Protein S and Fibrinogen of Pregnant Women with Malaria in Owerri Metropolis. Madonna University journal of Medicine and Health Sciences. 2022;2(2):1-9.
19. Obeagu EI, Ikpenwa JN, Chukwueze CM, Obeagu GU. Evaluation of protein C, protein S and fibrinogen of pregnant women in Owerri Metropolis. Madonna University Journal of Medicine and Health Sciences. 2022;2(1):292-8. https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/57.
20. Obeagu EI, Obeagu GU, Adepoju OJ. Evaluation of haematological parameters of pregnant women based on age groups in Olorunsogo road area of Ido, Ondo state. J. Bio. Innov11 (3). 2022:936-41.
21. Obeagu EI. An update on utilization of antenatal care among pregnant Women in Nigeria. Int. J. Curr. Res. Chem. Pharm. Sci. 2022;9(9): 21-6.DOI: 10.22192/ijcrcps.2022.09.09.003

Citation: Obeagu EI, Obeagu GU. Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective. Elite Journal of Health Science, 2024; 2(1): 43-50

22. Okoroiwu IL, Obeagu EI, Obeagu GU. Determination of clot retraction in preganant women attending antenatal clinic in federal medical centre Owerri, Nigeria. Madonna University Journal of Medicine and Health Sciences. 2022;2(2):91-7. https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/67.
23. Okorie HM, Obeagu EI, Obarezi HC, Anyiam AF. Assessment of some inflammatory cytokines in malaria infected pregnant women in Imo State Nigeria. International Journal of Medical Science and Dental Research. 2019;2(1):25-36.
24. Ezeoru VC, Enweani IB, Ochiabuto O, Nwachukwu AC, Ogbonna US, Obeagu EI. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. Journal of Pharmaceutical Research International. 2021;33(4):10-9.
25. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of some haematological parameters in malaria infected pregnant women in Imo state Nigeria. Int. J. Curr. Res. Biol. Med. 2018;3(9):1-4.
26. Nwosu DC, Obeagu EI, Ezenwuba C, Agu GC, Amah H, Ozims SJ, Nwanjo HU, Edward A, Izuchukwu IF, Amadike JN, Nwagwu AJ. Antioxidant status of children with Plasmodium falciparum malaria in Owerri municipal council of Imo state. Int. J. Curr. Res. Chem. Pharm. Sci. 2016;3(8):40-6.
27. Okamgba OC, Nwosu DC, Nwobodo EI, Agu GC, Ozims SJ, Obeagu EI, Ibanga IE, Obioma-Elemba IE, Ihekaire DE, Obasi CC, Amah HC. Iron Status of Pregnant and Post-Partum Women with Malaria Parasitaemia in Aba Abia State, Nigeria. Annals of Clinical and Laboratory Research. 2017;5(4):206.
28. Obeagu EI, Hassan AO, Adepoju OJ, Obeagu GU, Okafor CJ. Evaluation of Changes in Haematological Parameters of Pregnant Women Based on Gestational Age at Olorunsogo Road Area of Ido, Ondo State. Nigeria. Journal of Research in Medical and Dental Science. 2021;9(12):462-.links/61b1e32f0c4bfb675178bfa7/Evaluation-of-Changes-in-Haematological-Parameters-of-Pregnant-Women-Based-on-Gestational-Age-at-Olorunsogo-Road-Area-of-Ido-Ondo-State-Nigeria.pdf.
29. Anyiam AF, Obeagu EI, Obi E, Omosigho PO, Irondi EA, Arinze-Anyiam OC, Asiyah MK. ABO blood groups and gestational diabetes among pregnant women attending University of Ilorin Teaching Hospital, Kwara State, Nigeria. International Journal of Research and Reports in Hematology. 2022;5(2):113-121.
30. Obeagu EI. Gestational Thrombocytopaenia. J Gynecol Women's Health. 2023;25(3):556163. links/64b01aa88de7ed28ba95fccb/Gestational-Thrombocytopaenia.pdf.
31. Jakheng SP, Obeagu EI, Abdullahi IO, Jakheng EW, Chukwueze CM, Eze GC, Essien UC, Madekwe CC, Madekwe CC, Vidya S, Kumar S. Distribution Rate of Chlamydial Infection According to Demographic Factors among Pregnant Women Attending Clinics in Zaria Metropolis, Kaduna State, Nigeria. South Asian Journal of Research in Microbiology. 2022;13(2):26-31.
32. Obeagu EI, Ogbonna US, Nwachukwu AC, Ochiabuto O, Enweani IB, Ezeoru VC. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. Journal of Pharmaceutical Research International. 2021;33(4):10-9.

Citation: Obeagu EI, Obeagu GU. Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective. Elite Journal of Health Science, 2024; 2(1): 43-50

33. Anyiam AF, Arinze-Anyiam OC, Omosigho PO, Ibrahim M, Irondi EA, Obeagu EI, Obi E. Blood Group, Genotype, Malaria, Blood Pressure and Blood Glucose Screening Among Selected Adults of a Community in Kwara State: Implications to Public Health. Asian Hematology Research Journal. 2022;6(3):9-17.
34. Obeagu EI, Nimo OM, Bunu UO, Ugwu OP, Alum EU. Anaemia in children under five years: African perspectives. Int. J. Curr. Res. Biol. Med. 2023; 1:1-7.
35. Madekwe CC, Madekwe CC, Obeagu EI. Inequality of monitoring in Human Immunodeficiency Virus, Tuberculosis and Malaria: A Review. Madonna University journal of Medicine and Health Sciences. 2022;2(3):6-15.
36. Offie DC, Ibekwe AM, Agu CC, Esimai BN, Okpala PU, Obeagu EI, Ufelle SA, Ogbonna LN. Fibrinogen and C-Reactive Protein Significance in Children Infected by Plasmodium falciparum Species in Enugu, Enugu State, Nigeria. Journal of Pharmaceutical Research International. 2021;33(15):1-8.
37. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of coagulation parameters in malaria infected pregnant women in Imo state, Nigeria. International Journal of Current Research in Medical Sciences. 2018;4(9):41-9.
38. Ogbonna LN, Ezeoru VC, Ofodile AC, Ochiabuto OM, Obi-Ezeani CN, Okpala PU, Okafor CJ, Obeagu GU, Busari AI, Obeagu EI. Gender Based Variations of Haematological Parameters of Patients with Asymptomatic Malaria in Akure, Ondo State, Nigeria. Journal of Pharmaceutical Research International. 2021;33(8):75-80.
39. Eberendu IF, Ozims SJ, Agu GC, Amah HC, Obasi CC, Obioma-Elemba JE, Ihekaire DE, Ibanga IE, Amah CC, Obeagu EI, Nwosu DC. Impact of human activities on the breeding of mosquitoes of human disease in Owerri metropolis, Imo state. Int J Adv Res Biol Sci IJARBS. 2017;4(12):98-106.
40. Obeagu EI, Ofodile AC, Okwuanaso CB. A review on socio economic and behavioral aspects of malaria and its control among children under 5 years of age in Africa. J Pub Health Nutri. 2023; 6 (1): 136.
41. Obeagu EI, Abdirahman BF, Bunu UO, Obeagu GU. Obsterics characteristics that effect the newborn outcomes. Int. J. Adv. Res. Biol. Sci. 2023;10(3): 134-43.DOI: 10.22192/ijarbs.2023.10.03.016
42. Obeagu EI, Ogunnaya FU. PREGNANCYINDUCED HAEMATOLOGICAL CHANGES: A KEY TO MARTERNAL AND CHILD HEALTH. European Journal of Biomedical. 2023;10(8):42-43. links/64c890bddb38b20d6dad2c5c/PREGNANCY-INDUCED-HAEMATOLOGICAL-CHANGES-A-KEY-TO-MARTERNAL-AND-CHILD-HEALTH.pdf.
43. Ezeoru VC, Enweani IB, Ochiabuto O, Nwachukwu AC, Ogbonna US, Obeagu EI. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. Journal of Pharmaceutical Research International. 2021;33(4):10-9.
44. Okamgba OC, Nwosu DC, Nwobodo EI, Agu GC, Ozims SJ, Obeagu EI, Ibanga IE, Obioma-Elemba IE, Ihekaire DE, Obasi CC, Amah HC. Iron Status of Pregnant and Post-Partum Women with Malaria Parasitaemia in Aba Abia State, Nigeria. Annals of Clinical and Laboratory Research. 2017;5(4):206. links/5ea97df145851592d6a8acf2/Iron-Status-

of-Pregnant-and-Post-Partum-Women-with-Malaria-Parasitaemia-in-Aba-Abia-State-Nigeria.pdf.

45. Eze RI, Obeagu EI, Edet FN. Frequency of Rh Antigen C And c among pregnant women in Sub-Urban area in Eastern Nigeria. Madonna Uni J Med Health Sci. 2021;1(1):19-30.
46. Obeagu EI, Ofodile AC, Okwuanaso CB. A review of urinary tract infections in pregnant women: Risks factors. J Pub Health Nutri. 2023; 6 (1). 2023; 137:26-35. links/63c3a9116fe15d6a571e8bba/A-review-of-urinary-tract-infections-in-pregnant-women-Risks-factors.pdf.
47. Obeagu EI, Obeagu GU, Musiimenta E. Post partum haemorrhage among pregnant women: Update on risks factors. Int. J. Curr. Res. Med. Sci. 2023;9(2): 14-7.DOI: 10.22192/ijcrms.2023.09.02.003
48. Obeagu EI, Obeagu GU, Ogunnaya FU. Deep vein thrombosis in pregnancy: A review of prevalence and risk factors. Int. J. Curr. Res. Chem. Pharm. Sci. 2023;10(8): 14-21.DOI: 10.22192/ijcrcps.2023.10.08.002
49. Jakheng SP, Obeagu EI, Jakheng EW, Uwakwe OS, Eze GC, Obeagu GU, Vidya S, Kumar S. Occurrence of Chlamydial Infection Based on Clinical Symptoms and Clinical History among Pregnant Women Attending Clinics in Zaria Metropolis, Kaduna State, Nigeria. International Journal of Research and Reports in Gynaecology. 2022;5(3):98-105.
50. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of some haematological parameters in malaria infected pregnant women in Imo state Nigeria. Int. J. Curr. Res. Biol. Med. 2018;3(9): 1-4.DOI: 10.22192/ijcrbm.2018.03.09.001
51. Onyenweaku FC, Amah HC, Obeagu EI, Nwandikor UU, Onwuasoanya UF. Prevalence of asymptomatic bacteriuria and its antibiotic susceptibility pattern in pregnant women attending private ante natal clinics in Umuahia Metropolitan. Int J Curr Res Biol Med. 2017;2(2): 13-23.DOI: 10.22192/ijcrbm.2017.02.02.003
52. Okoroiwu IL, Chinedu-Madu JU, Obeagu EI, Vincent CC, Ochiabuto OM, Ibekwe AM, Amaechi CO, Agu CC, Anoh NV, Amadi NM. Evaluation of Iron Status, Haemoglobin and Protein Levels of Pregnant Women in Owerri Metropolis. Journal of Pharmaceutical Research International. 2021;33(27A):36-43.
53. Obeagu EI, Njar VE, Obeagu GU. Infertility: Prevalence and Consequences. Int. J. Curr. Res. Chem. Pharm. Sci. 2023;10(7):43-50.
54. Emeka-Obi OR, Ibeh NC, Obeagu EI, Okorie HM. Evaluation of levels of some inflammatory cytokines in preeclamptic women in owerri. Journal of Pharmaceutical Research International. 2021;33(42A):53-65.
55. Obeagu EI, Faduma MH, Uzoma G. Ectopic Pregnancy: A Review. Int. J. Curr. Res. Chem. Pharm. Sci. 2023;10(4): 40-4.DOI: 10.22192/ijcrcps.2023.10.04.004
56. Obeagu EI, Gamade SM, Obeagu GU. The roles of Neutrophils in pregnancy. Int. J. Curr. Res. Med. Sci. 2023;9(5): 31-5.DOI: 10.22192/ijcrms.2023.09.05.005
57. Eze R, Obeagu EI, Nwakulite A, Okoroiwu IL, Vincent CC, Okafor CJ, Chukwurah EF, Chijioke UO, Amaechi CO. Evaluation of Copper Status and Some Red Cell Parameters of Pregnant Women in Enugu State, South Eastern Nigeria. Journal of Pharmaceutical Research International. 2021;33(30A):67-71.

Citation: Obeagu EI, Obeagu GU. Maternal Malaria and Neonatal Developmental Outcomes: A Life course Perspective. Elite Journal of Health Science, 2024; 2(1): 43-50

58. Obeagu EI, Obeagu GU. Molar Pregnancy: Update of prevalence and risk factors. Int. J. Curr. Res. Med. Sci. 2023;9(7): 25-8.DOI: 10.22192/ijcrms.2023.09.07.005
59. Obeagu EI, Bunu UO. Factors that influence unmet need for family planning. International Journal of Current Research in Biology and Medicine. 2023;8(1):23-7.
60. Ibebuike JE, Ojie CA, Nwokike GI, Obeagu EI, Nwosu DC, Nwanjo HU, Agu GC, Ezenwuba CO, Nwagu SA, Akujuobi AU. Barriers to utilization of maternal health services in southern senatorial district of Cross Rivers state, Nigeria. International Journal of Advanced Multidisciplinary Research. 2017;4(8): 1-9.DOI: 10.22192/ijamr.2017.04.08.001
61. Emannuel G, Martin O, Peter OS, Obeagu EI, Daniel K. Factors Influencing Early Neonatal Adverse Outcomes among Women with HIV with Post Dated Pregnancies Delivering at Kampala International University Teaching Hospital, Uganda. Asian Journal of Pregnancy and Childbirth. 2023;6(1):203-11. http://research.sdpublishers.net/id/eprint/2819/.
62. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of coagulation parameters in malaria infected pregnant women in Imo state, Nigeria. International Journal of Current Research in Medical Sciences. 2018;4(9):41-9.DOI: 10.22192/ijcrms.2018.04.09.006
63. Obeagu EI, Obeagu GU. Postpartum haemorrhage among women delivering through spontaneous vaginal delivery: Prevalence and risk factors. Int. J. Curr. Res. Chem. Pharm. Sci. 2023;10(8):22-6.DOI: 10.22192/ijcrcps.2023.10.08.003
64. Obeagu E, Eze RI, Obeagu EI, Nnatuanya IN, Dara EC. ZINC LEVEL IN APPARENTLY PREGNANT WOMEN IN URBAN AREA. Madonna University journal of Medicine and Health Sciences. 2022;2(1):134-48. https://www.journal.madonnauniversity.edu.ng/index.php/medicine/article/view/40.
65. Ogomaka IA, Obeagu EI. Malaria in Pregnancy Amidst Possession of Insecticide Treated Bed Nets (ITNs) in Orlu LGA of Imo State, Nigeria. Journal of Pharmaceutical Research International. 2021;33(41B):380-386.