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Original Research Article

Retrospective Analysis of a Decade-Long (2015-2025) Febrile Illnesses in the Federal Polytechnics Situated in Nasarawa State

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Abstract: This study titled retrospective analysis of febrile illness induced byPlasmodium falciparum within the volunteered members of this academic institution between male and female students is a decade long study carried out from 2015 t0 2025. Commercial rapid Plasmodium falciparum test kits were used to conduct this institutional -based laboratory analysis. To obtain participants biodata some demographic factors were included in the documents they filled. This decade long research revealed an overall prevalence of 25% Plasmodium falciparum prevalence in 2015, with prevalences of 22.41% and 28.57% among male and female respondents respectively. In 2016, the overall malaria parasite prevalence was 48.00%, while male gender revealed a prevalence of 48.07%, the female gender revealed a prevalence of 52.08%. The Plasmodium falciparum research of 2017 revealed an overall prevalence of 15%, with 18.75 in males and 13.23 in females. The report of Plasmodium falciparum prevalence of 2018 indicated an overall prevalence of20.14%, where male subjects had a prevalence of 27.85% compared to the 14.46 % of their female counterparts. In 2019, 28.67% was the overall Plasmodium falciparum prevalence, for males 33.11% and for females 24.18%. The Plasmodium falciparum prevalence of 2020 gave an overall report 3.50%, while for males it was 04.25% and 02.83% for females. In the year 2021 the overall Plasmodium falciparum prevalence was 48.00%, 43.66% for males and 51.80% for females. In 2022, 73.33% was recorded as the overall prevalence, 62.06% and 76.03% was for males and females respectively. The study in the year 2023 reported an overall Plasmodium falciparum prevalence of 15.00%, while 25.00% was recorded for males and 11.11% was recorded for females. The ninth year (2024) of the Plasmodium falciparum prevalence study gave an overall prevalence of 30.00%, 44.83% for males and 36.64% for females. In the last year (2025) of the Plasmodium falciparum prevalence study the research gave an overall prevalence of 75.86%, 60.00% for female and 84.21% for females. This decade long study of febrile Plasmodium falciparum prevalence among males and females revealed higher prevalences among males in the studies carried out in the years 2017, 2018, 2019, 2020, 2023, and 2024, while the prevalences were higher among the females in the following years 2015, 2016, 2021, 2022, and 2025. The sustained infection of Plasmodium falciparum parasite indicates endemicity in this institution and community and enough breeding ground for the vector-mosquitoes to maintain the transmission of this parasite round the year.

Keywords: Febrile, Plasmodium, falciparum, Antibody, Prevalence.

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INTRODUCTION

Malaria parasite is the most common protozoan parasitic disease found in the developing parts of the world (Davidson, 2000). It was once thought that the disease came from fetid marshes and hence the name malaria (Olomese *et al.,* 1999). It has also been found out in 1880 by Charles Laveron a French army surgeon that has disease is caused by four different species; *Plasmodium falciparum, Plasmodium ovale, Plasmodium vivax*, and *Plasmodium malariae* (Nonstrand, 1978). of those four different pathogenic species pathogenic to man, *P. falciparum* and *P vivax* infections most often results in death among children in endemic areas and is often causes complication of cerebral malaria (Bawa *et al*., 2014; WHO, 2016). The

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clinical manifestation of malaria varies with geography, epidemiology, immunity and age (Tinashe *et al*., 2018).

There remains a gap in most setting in the use of those prevention methods (Olusegun-joseph *et al.,* 2016). Majority of the endeavours to control malaria was focused on the development of strategies, which targeted high risk group (Tinashe et al., 2018)). Even in the modern world with effective strategies people remain at risk, particularly resulting from *P. falciparum* that causes the most serious infection (Cbulskis *et al.*, 2016).

MATERIALS/METHODOLOGY

This study site is a state in the Nigeria's North Central region which shared boundaries with Taraba, Plateau, Kaduna State, Benue, Kogi states and to the Federal Capital Territory, Abuja. It was named for the historic Nassarawa Emirate, the state was formed from the west of Plateau State on 1 October 1996.

The following materials and reagents were used during this research: sterile disposable lancets; 70% alcohol swabs; sterile cotton wool; clean, grease-free microscope slides; commercially prepared anti-A and anti-B monoclonal antisera; applicator sticks for mixing; wax marking pencil/marker for slide labelling; and hand gloves and a sharps disposal container were utilised throughout this study. This research was intended to reveal the dynamics and trend of the endemic malaria parasites among the ever-changing students' population of this higher institution of academic learning, among the demography of the participants, the sex of respondents was specifically selected in order to observe any differences in response of both sexes inhabiting high region of mosquito and malaria parasite endemicity; Blood samples of every participants were collected by finger prick after sterilising the fingertip with a piece cotton soaked in ethanol. A few drops of respondent's blood were added to the sample well and a buffer solution was added and the result read after between five to ten minutes according to the manufacturers instruction.

RESULTS

Febrile Illnesses among Students of the Federal Polytechnics Nasarawa, Nasarawa State From 2015 to 2025 Report

Properties	Samples Collected	Positive samples	Percentage Positive	(x^2) Chi-Square	P-Value
Year 2015					
Gender					
Male	58	13	22.41	0.493	0.480
Female	42	12	28.57		
Total	100	25	25.00		
2016 Study					
Gender					
Male	52	23	48.07	0.814	0.367
Female	48	25	52.08		
Total	100	48	48.00		
2017 Study					
Gender					
Male	64	12	18.75	0.244	0.157
Female	136	18	13.23		
Total	200	30	15.00		
2018 Study					
Gender					
Male	61	17	27.85	0.403	0.227
Female	83	12	14.46		
Total	144	29	20.14		
2019 Study					
Gender					
Male	148	49	33.11	2.818	0.093
Female	152	37	24.18		
Total	300	86	28.67		
2020 Study					
Gender					
Male	94	04	04.25	0.300	0.584
Female	106	03	02.83		
Total	200	07	03.50		
2021 Study					
Gender					
Male	71	31	43.66	19.21	0.754

Properties	Samples Collected	Positive samples	Percentage Positive	(x^2) Chi-Square	P-Value
Female	79	41	51.8		
Total	150	72	48.00		
Year 2022					
Gender					
Male	29	18	62.06	2.333	0.127
Female	121	92	76.03		
Total	150	110	73.33		
Year 2023					
Gender					
Male	84	21	25.00	9.150	0.002
Female	216	24	11.11		
Total	300	45	15.00		
Year 2024					
Gender					
Male	29	13	44.83	0.711	0.399
Female	121	44	36.64		
Total	150	57	30.00		
Year 2025					
Gender					
Male	50	30	60.00	0.711	0.399
Female	95	80	84.21		
Total	145	110	75.86		

DISCUSSION

Samples collected from volunteers between 2015 and 2025 range from one hundred and (100) to three hundred samples (300) samples yearly. For the decade long researches, the samples obtained for this research was one thousand nine hundred and thirty-nine thousand (1,939), while the number of samples collected from male was seven hundred and forty (740) and samples collected from females was one thousand one hundred and ninety-nine (1,199). This research revealed an overall prevalence of *Plasmodium falciparum* as six hundred and nineteen (619) of the one thousand nine hundred and thirty-nine thousand (1,939) samples studied, giving an overall prevalence of 32.0%. This study revealed that two hundred and thirty-one (231) samples tested positive for Plasmodium falciparum in male respondents giving a prevalence of 31.2% in males, while three hundred and eighty-eight (388) sample tested positive for Plasmodium falciparum in female respondents giving a prevalence of 32.4 %. (Kalil *et al*., 2020; Mulugeta *et al*., 2022; Tigu *et al*., 2022). These outcome among the test groups indicated no statistically significance difference *Plasmodium falciparum* prevalence between male and females studied. This revealed a Chi-square of 0.711. The result of this study is in tandem with malaria prevalence 38% and 32% in both males and females respectively (Adamu *et al*., 2022). The prevalence of 44.8% percent revealed by this research is in agreement with result reported by john and Nwachukwu (2023) in south-eastern Nigeria. Likewise, Olawuyi *et al*., (2023) than females because they suggested males have outdoor engagements than females. The near-uniform malaria prevalence across the educational level suggested that malaria risk is pervasive regardless of academic level. The highest *Plasmodium parasite* prevalence of 50% among the 15-18 years old, followed by44.7% among the 19-22 years old is in tandem with Adebayo and Musa who reported higher prevalence among the younger age group.

CONCLUSION

This research showed an overall prevalence of 38.0%, revealing a higher prevalence in males despite samples being disproportionately collected because of the overwhelming population of females compared to male in the population available for this study. The highest malaria prevalence of 50% and 44.7% were recorded among age groups of 15-22 years, which is almost double of the prevalence recorded 23-30 years old. The malaria prevalence mong educational levels indicate a uniform infection, showing that education is a risk factor that can influence the trend and dynamics of malaria parasite infection withing the period of study and among the study groups.

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