International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Applied Study on Causes of Malaria and its Impact on the Health of Children in Sudan

Abdalla Mohammed Ahmed Alhaj
Assistant Professor in Applied Statistics, Department of Business Administration, Faculty of Sciences and Humanity Studies -AlDwadmmi, Shaqra University- Saudia Arabia
admoah@su.edu.sa

Abstract

The problem of the research discusses in health field by attempting to seeking a causes of malaria and its impact on the health of children in Sudan. a–primary Data malaria test survey in White Nile state from Elduwaim town and Elsifaraia, Elmanara village, The main reason to select this area for the study according to exposure by epidemics diseases and suffering from shortage of social and health services. By using questionnaire for mothers with babies admitted, with critical condition, Longitudinal Study design depending on cases. To collect data, we require to determine the sample size of population. A sample of 500 mothers of children are selected to present sample size required. The research objectives to measure the relationship between drinking water and malaria, measure the relationship between Cause of Malaria and environment, to measure the relationship between response and treatment-,to measure the relationship between Cause of malaria and Meals before and during illness,. By using the Statistical Package for Social Science (SPSS) Program version N. (21) The data analysis include simple descriptive statistics and applied statistics test with use cross tabulation, and other statistics measures. The results indicate there many problems for cause malaria even the respondents emphasis the Environmental more Factor to causes the child malaria or nutrition

needed. The result slowed that the common complications are infection and all respondents suffer from infection by malaria and the 25% is infection more than two time and 24% more than three time and 20% is once time and the result indicate that the majority child illness related to the weight of child and bleeding disorder, convulsion malaria, noun immunization, not vaccination.

Keywords: Applied Study, Malaria, Health of Children, Sudan.

Introduction

In Sudan, malaria still remains a major public health problem, where an estimated seven million new cases are registered annually. Although severe malaria is life threatening to children, information available on the severity of disease are not rich, attempts to control malaria have usually followed one of three approaches, eliminating the parasite by administering antimalarial, eradicating the carrier mosquito or reducing man-vector contact so as to cut an important link in the lifecycle of the parasite. Health seeking for malaria will then involve all activities or modalities engaged in by the individual to avert or treat the occurrence of malaria. Cultural beliefs about the etiology of illness will invariably.

Research Problem

The problem of the research discusses in health field by attempting to seeking a Causes of malaria and its impact on the health of children in Sudan; the effects of bouts of illness of children, its hypothesized that infection of malaria is in flounced by such factors as type of treatment, type of health care provider in Sudan White Nile state particularly in Elduwaim town and Elsiferia and Elmanara villages.

Research Questions

- How can we to evaluate the relationship between Drinking Water and causes of Malaria?

- How can we evaluate Cause of Environment as a cause of malaria?
- How can we evaluate response and treatment of Malaria?
- How can we measure the relation between Cause of Malaria and nutrition before illness?
- How can we measure between Cause of Malaria and nutrition during illness?

Research Objectives

- To measure the relationship between Drinking Water and Cause of Malaria.
- To measure the relationship between Cause of Malaria and Environment.
- To measure the compare between Response and Treatment of Malaria.
- To measure the relationship between Cause of Malaria and Meals before illness.
- To measure the relationship between Cause of Malaria and Meal during illness.

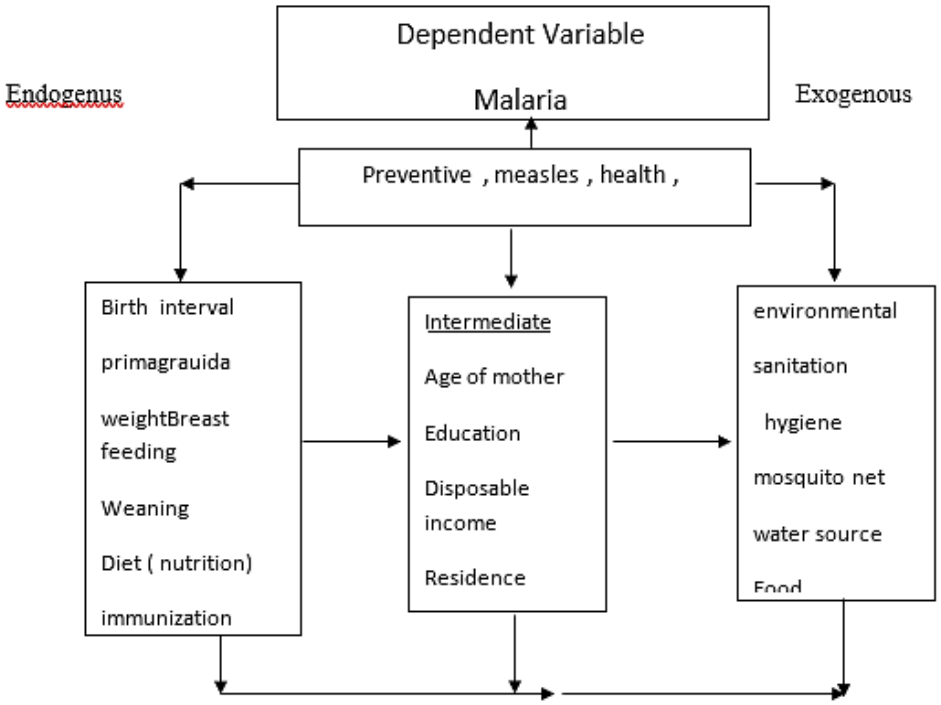
Research Hypothesis

- To test the relationship between Drinking Water and Cause of Malaria.
- To test the relationship between Cause of Malaria and Environment.
- To test the relationship between Response and Treatment of Malaria.
- To test the relationship between Cause of Malaria and Meals before illness.
- test the relationship between Cause of Malaria and Meal during illness.

Research Methodology

- Conceptual Framework.
- Schematic representation.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)



(Figure 1-1): Schematic representation

- Variables Definition:

Category	Name	Type	Measurement
Dependent	Age of child	Intermediate	Numeric desecrate
Dependent	Age of mother	Intermediate	Numeric desecrate
Dependent	Education	Intermediate	Numeric desecrate
Dependent	Disposable income	Intermediate	Numeric desecrate
Dependent	Residence	Intermediate	Categorical
Dependent	Occupation	Intermediate	Categorical
Dependent	Family planning	Intermediate	Numeric desecrate
Dependent	Birth	Endogenous	String
Dependent	Primagravida	Endogenous	String
Dependent	Parity	Endogenous	Numeric Continuous
Dependent	Breast feeding	Endogenous	String

Dependent	weight	Endogenous	Numeric Continuous
Dependent	Weaning	Endogenous	String
Dependent	Diet (nutrition)	Endogenous	Operational
Dependent	Immunization	Endogenous	String
Dependent	Genetic factor	Endogenous	String
Dependent	Malaria test	Endogenous	String
Dependent	Number of children	Endogenous	Numeric desecrate
Dependent	Environmental	Exogenous	String
Dependent	Sanitation	Exogenous	String
Dependent	Hygiene	Exogenous	String
Dependent	Water source	Exogenous	String
Dependent	Mosquito net	Exogenous	Categorical
Dependent	Food preparation	Exogenous	String
Dependent	Location	Exogenous	Categorical

Source of Data

- Types of data:

a–primary Data: malaria test survey in White Nile state from Elduwaim town and Elsifaraia, Elmanara village, the main reason to select this area for the study according to exposure by epidemics diseases and suffering from shortage of social and health services. By using questionnaire for mothers with babies admitted, with critical condition including the information about age, weight, and type of child illness and Observation for mosquito- net for malaria prevention.

Study Design

Longitudinal Study design depending on cases. To collect data, we require to determine the sample size of population.

- Sample size

A sample of 500 children are selected to present sample size required by using the formula and the following step:

$$n = \frac{z2\ pq}{d2}$$

Where:

z = confidence level, 100 (1- α) %.
P = anticipated population proportion for children admitted with malaria.
q = (1-p) proportion for children admitted with malaria.
d = absolute precision (percentage points) d is selected as the error that one can endure if sample is not representative.

Practically to select a sample this with respect to time and cost, 95% confidence interval for sample selection.

$$n = \frac{(1.96)2 * 20*80}{25} = 246 = 250$$

$$n = 250 * 2 = 500$$

Thus, we select 500 mothers child as a sample.

The justification of selecting P = .80 is to ensure high representation of anticipated population proportion for children admitted with malaria in our sample.

- Field work:

Data was collected from survey in White Nile state from Eldweim town and Elsifaraia, Elmanara village, the respondent are mothers, child, doctors staff.

- Data Analysis:

By using the Statistical Package for Social Science (SPSS) Program. The data analysis includes simple descriptive statistics, cross tabulation, test analysis, and other statistics measures.

Organization of the Research Study

The study is composed of four chapters. Chapter one starts with introduction, research problem, research question, research Objectives, research hypothesis, methodology, Source of Data, Study design, Sample size, Field work, Data analysis, Organization of the research study. Chapter two is about literature review. Chapter three is for dada analysis and statistical results. Chapter four is for conclusion and recommendation, references

Literature Review

In Sudan, malaria remains a major public health problem, with a case prevalence of 93 per 1000 in 2002. It represented 25% of hospital admission in children. We conducted a cross-sectional study in 4 district paediatric hospital in Sudan in the 5 months period of the rainy season August December 2000.The hospital were located in Omdurman In Khartoum state, Wad Medani and Sinnar in central Sudan and Gedaref in eastern Sudan. Although severe malaria is life-threatening to children, there is limited information available on the severity of the disease, management, deaths and associated factors in Sudan; therefore, there is an urgent need for reliable clinical and epidemiological information on severe malaria as a killing disease in children. The objective of this study was to assess the clinical and epidemiological features of the disease before and on admission to hospital, management in hospital, outcome of the disease and associated risk factors for death. Total malaria load compared to total paediatric admission among the 4 hospitals was 21.3% (4462/20944). Severe malaria load from the total malaria outpatient attendance among children was 12.2% (543/4462). Most of the severe malaria cases in children (304 cases, 56.0%) were reported in Sennar followed by Wad Medani 99 cases (18.2%), Omdurman 75 cases (13.8%) and Gedaref 65 cases (12.0%) (Annual Statistical Report, 2012).

Malaria has been well controlled or eliminated in the five northernmost African countries, Algeria, Egypt, Libya, Morocco and Tunisia, The South of the Sahara is the most endemic region in the world and it is in the region that malaria claims its highest toll. Malaria becomes the most pernicious and prevalent health problem in the region where transmission occurs. It is responsible for at least a million deaths each year with Africa bearing the brunt of the disease accounting for more than 90% of the whole cases (Wellcome, 2002; WHO, 2003; White, 2004). Every year about 300 million clinical cases are also reported (Bloland et al., 2000; Nuwaha, 2001; Moree and Ewart, 2004; Breman et al., 2004; Barat et al., 2004; Agyeponp and Kankeye- Kayonda, 2004). This indicates that malaria constitutes major health constraints to the people and hinder them from day to day social activities as a result of clinical attendance, admissions, or ill-health. Malaria is a prime etiologic factor of slowed economic growth in Africa as a result of loss of quality manpower; productivity which might be expressed in terms of absenteeism from employment, discounted future lifetime earning of those who die, lost school days and permanent neurological and other damages associated with falciparum malaria. Malaria is a leading cause of child morbidity and mortality in Africa as children are said to account for 90% of the whole cases following the Abuja summit on Roll Back Malaria in year 2000, the following specific burden of malaria was admitted (WHO, 2010).

Perception of disease is related to a person's socio-cultural reality (their social role and expected behaviours) to shape both behaviour and ability to respond to disease). It is further observed that it is the interaction between the expected behaviour and perceptions of disease, as defined individually and by society, that affects both if and how an individual acts to prevent disease, as well as what they do when they become sick (their illness behaviour). Kleinman (1981) also observed that illness recognition, definition and management (Jones and Williams, 20040).

Attempts to control malaria have usually 158 followed one of three approaches; eliminating the parasite by administering antimalarial, eradicating the carrier mosquito or reducing man-vector contact so as to cut an important link in the lifecycle of the parasite. Health seeking for malaria will then involve all activities or modalities engaged in by the individual to avert or treat the occurrence of malaria. Cultural beliefs about the aetiology of illness will invariably, dictate the kind of healers to be consulted or therapy to be utilized. Preventive modalities include, the use of bed net [insecticide treated net (ITN)], spraying the room with insecticide, burning of mosquito coils, taking antimalarial and so on. Inappropriate etiologic attributions in Ghana translate to certain preventive modalities as respondents claimed that asra caused by heat will continue to remain with them as far as sun continue to shine, asra caused by food can be prevented by eating good food. Malaria is a serious health issue in Sub-Saharan Africa and Nigeria in particular. Therefore it is expected all hands must be on deck to eradication this. This requires the crucial roles of health workers and other relevant stakeholders. Since the roles of health workers are crucial in providing information on drug use, pharmacists, physicians, nurses, local chemists, and other health workers should be trained on the behavioural influences and attributable causes of antimalarial drug resistance so that they could pass information to the patients on appropriate drug use patterns. Community health workers ought to be reoriented towards preventive care rather than mere cure. It is against this background that they may play pivotal roles in health talk within the community especially as regards appropriate perception and health seeking behaviour at the community level. The community initiatives introduced by Roll Back Malaria (RBM) must be fully implemented in the control of malaria in Africa and elsewhere. The goal to halve the burden of malaria by 2010 could then be achieved (Emeka Emmanuel Okafor and Jimoh Amzat, 2007).

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Zeidan and other group researcher discusses the clinical and epidemiological features of severe malaria in children in four hospitals in Sudan we assessed the clinical and epidemiological features of severe malaria cases before admission, management in hospital and outcome and associated factors in 4 hospitals in different areas of Sudan over a 5-month period in 2000. There were 543 children admitted representing 21% of all paediatric admissions. Median age was 36 months. Treatment at home was the first action taken by 57.5% of families. Case fatality rate was 5/1000 and 93% of the children who died were under 9 years. Highest risk of death was associated with delay in seeking treatment and severity of illness before admission. Omdurman Hospital in Khartoum had the best case-management performance index compared to the other hospitals. A severe malaria patient is defined by the World Health Organization (WHO) as a febrile patient with falciparum malaria with some complications of no other obvious causes who requires emergency hospitalization treatment. Out of 1.5 to 2.7 million deaths that occur in the world every year as a result of malaria, 1 million are children. In Africa, malaria kills 1 child in every 20 under the age of 5 years (Zeidan and other group, 2006).

Data Analysis and Statistical Results

White Nile State is the third State in the Sudan regarding the population size (1,730.588) and growth rate 0.2%. It covers the area of 33.817 km, and the population size of the area study (295,695) from Elduwaiman it has one general Specialize Teaching Hospital. This study consists 500 questionnaire to collect information about the mother of child, 250 from Elduiem and 250 represents two villages i.e. 120 from Elsiferaya and 130 from Elmanara. The equipment was measured by check test.

Table (3-1): Age of the Mother:

Age	Frequency	Percent	Cumulative Percent
15 ---------- 19	19	0.04	0.04
20----------24	79	0.16	0.20
25----------29	120	0.24	0.44

International Journal of Financial, Administrative and Economic Sciences, London Vol (3), No (12), 2024
https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

30----------34	106	0.21	0.65
35----------39	93	0.19	0.84
40----------44	47	0.09	0.93
45----------49	31	0.06	0.99
49 & above	5	0.01	1.00
Total	500		

Table (3.1) showing age of the mother is one of the important determinants of pregnancy, less than 20 years and more than 50 are the high risk factors. From the table above those of the first category represent 24% while the second is 0.1%.

Table (3.2): Number of Male children

Number	Frequency	Percent	Cumulative Percent
1.00	228	45.6	45.6
2.00	122	24.4	70.0
3.00	79	15.8	85.8
4.00	37	7.4	93.2
5.00	25	5.0	98.2
6.00	8	1.6	99.8
7.00	1	.2	100.0
Total	500	100.0	

Table (3.2) shows the number of male children about 46% with one child followed by those with two and three male children.

Table (3.3): Number of Female Children:

Number	Frequency	Percent	Cumulative Percent
1.00	263	52.6	52.6
2.00	122	24.4	77.0
3.00	77	15.4	92.4
4.00	29	5.8	98.2
5.00	8	1.6	99.8
6.00	1	.2	100.0
Total	500	100.0	

Table (3.3) shows the same pattern of female children as male children, the number of female children about 46% with one child followed by those with two and three male children.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.4): Years of Schooling

Type	Frequency	Percent	Cumulative Percent
Illiterate	93	18.6	18.6
Khalwa	6	1.2	19.8
Basic	220	44.0	63.8
Secondary	158	31.6	95.4
Graduate	23	4.6	100.0
Total	500	100.0	

Table (3.4) shows that mother had basic education represents 44% followed by 32% of secondary education, while 19% are illiterate.

Table (3.5): Spending Per Month

Amount	Frequency	Percent	Cumulative Percent
0 ----------200	119	0.24	0.24
200----------400	274	0.54	0.78
400----------600	89	0.18	0.96
600----------800	12	0.02	0.98
800----------1000	4	0.01	0.99
1000 & above	2	0.01	1.00
Total	500		

Table (3.5) shows that 54% spend 400 per monthly.

Table (3.6): Monthly Spending on Medical Treatments

Amount	Frequency	Percent	Cumulative Percent
0----------50	372	0.73	0.73
50----------100	110	0.22	0.95
100----------150	15	0.03	0.98
150----------200	2	0.01	0.99
200 & above	1	0.01	1.00
Total	500		

International Journal of Financial, Administrative and Economic Sciences, London Vol (3), No (12), 2024
https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.6) shows the expenditure on health care and we find that 73% spend 50 pounds monthly.

Table (3.7): Monthly Income before Malaria

Amount	Frequency	Percent	Cumulative Percent
0 ----------200	49	0.10	0.10
200----------400	227	0.45	0.55
400----------600	158	0.32	0.87
600----------800	37	0.07	0.94
800----------1000	22	0.04	0.98
1000 & above	7	0.02	1.00
Total	500		

Table (3.7) shows that Monthly Income before Malaria, the 45 % at income (200) and (400).

Table (3.8): Health Insurance

Type	Frequency	Percent	Cumulative Percent
Yes	117	23.4	23.4
No	383	76.6	100.0
Total	500	100.0	

Table (3.8) shows that 23.4% of residents have health insurance while 76.6% have not.

Table (3.9): Residence

Type	Frequency	Percent	Cumulative Percent
Town	250	50.0	50.0
Village	121	24.2	74.2
Manara	129	25.8	100.0
Total	500	100.0	

Table (3.9) shows that type of residence is another determinant of healthy life it is always found that people who are living in rural areas suffer from lack of education, sanitation, and health services concerned with those who are living in urban areas.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.10): House Ownership

Type	Frequency	Percent	Cumulative Percent
Owned	417	83.4	83.4
Hired	53	10.6	94.0
Other	30	6.0	100.0
Total	500	100.0	

Table (3.10) shows that 83.4% of the houses are owned, 10.6% are hired.

Table (3.11): Relation with Residence

Type	Frequency	Percent	Cumulative Percent
Resident	471	94.2	94.4
Displaced	2	.4	94.8
Mobile	21	4.2	99.0
Expatriate	4	.8	99.8
Other	1	.2	100.0
Total	499	99.8	
	500	100.0	

Table (3.11) indicates that 94.2% of the respondents are residents.

Table (3.12): House Type

Type	Frequency	Percent	Cumulative Percent
Cement	9	1.8	1.8
Red Bricks	74	14.8	16.6
Mud	395	79.0	95.6
Other	22	4.4	100.0
Total	500	100.0	

Table (3.12) shows that 1.8% of houses are made of cement, 14.8% are red bricks, 79% are made of mud.

Table (3.13): Source of Drinking Water

Type	Frequency	Percent	Cumulative Percent
Well	211	42.2	42.2
Surface Water	25	5.0	47.2
Canal	215	43.0	90.2
Other	49	9.8	100.0
Total	500	100.0	

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.13) shows only 42.2% have healthy water:

Figure (3-1): Source of drinking water

Table (3.14): Source of Energy

Type	Frequency	Percent	Cumulative Percent
Fire Wood	24	4.8	4.8
Charcoal	127	25.4	30.2
LPG	344	68.8	99.0
Electricity	5	1.0	100.0
Total	500	100.0	

Table (3.14) shows that the predominant use LPG as the main source of energy for cooking.

Table (3.15): Sanitation Program

Type	Frequency	Percent	Cumulative Percent
Yes	119	23.8	23.8
No	381	76.2	100.0
Total	500	100.0	

Table (3.15) shows about three quarters of the respondents do have sanitation program.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.16): Environment pollution:

Type	Frequency	Percent	Cumulative Percent
Pools	90	18.0	18.0
Moors	61	12.2	30.2
Sewage	93	18.6	48.8
Other	256	51.2	100.0
Total	500	100.0	

Table (3.16) shows that 48.8% of the respondents' area contains pools, moors, and sewages all to causes environment pollution and 51.2% by others.

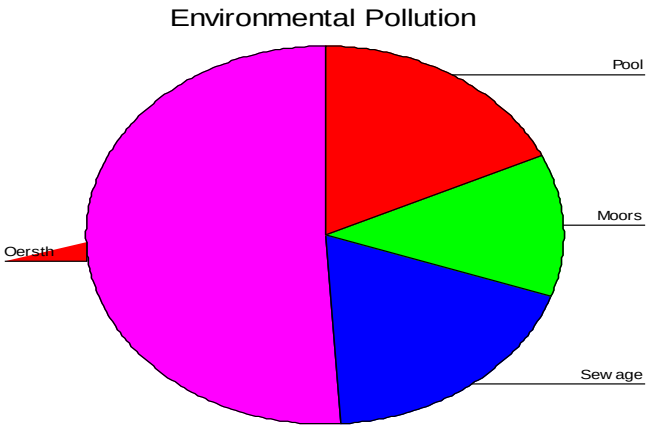


Figure (3-2): Environmental pollution

Table (3.17): Type of Malaria Treatment

Type	Frequency	Percent	Cumulative Percent
Chloroquine	66	13.2	13.2
Quinine	207	41.4	54.6
Fansidar	114	22.8	77.4
Traditional	29	5.8	83.2
Other	84	16.8	100.0
Total	500	100.0	

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.17) shows the majority have used Quinineto treatment of malaria at 41% and 22.8 % used fansidar.

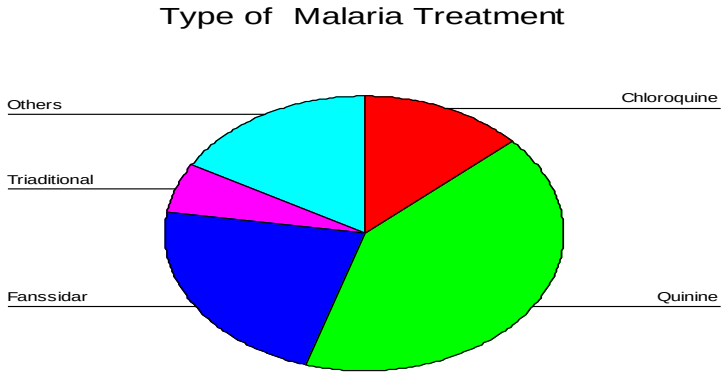


Figure (3-3): Type of malaria Treatment

Table (3.18): Method of treatment

Type	Frequency	Percent	Cumulative Percent
Pills	147	29.4	29.4
Injection	14	2.8	32.2
Traditional	73	14.6	46.8
System	266	53.2	100.0
Total	500	100.0	

Table 3.18) shows that 29.4% used pills for contraceptive and 2.8 % used injection and 14.6 % used traditional.

Table (3.19): Child Response

Type	Frequency	Percent	Cumulative Percent
Yes	460	92.0	92.0
No	40	8.0	100.0
Total	500	100.0	

Table (3.19) showing 92%.from respondent have response to treatment, and 8% have not response.

Table (3.20): Distance of Place of Medical Care

Type	Frequency	Percent	Cumulative Percent

International Journal of Financial, Administrative and Economic Sciences, London Vol (3), No (12), 2024
https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Yes	293	58.6	58.6
No	207	41.4	100.0
Total	500	100.0	

Table (3.20) shows 58.6% are distance of place of medical care and 41.4 % are not distance to area of treatment.

Table (3.21): Cost of Treatment

Type	Frequency	Percent	Cumulative Percent
High	213	42.6	42.6
Intermediate	253	50.6	93.2
Low	29	5.8	99.0
Free	2	.4	99.4
Other	3	.6	100.0
Total	500	100.0	

Table (3.21) shows 42.6% are high cost of treatment malaria and 50.6 % intermediate and 5.8% are low and .4 %are free

Table (3.22): Age of the Child

Amount	Frequency	Percent	Cumulative Percent
0----------1	113	0.23	0.23
1----------5	257	0.51	0.74
5----------10	100	0.20	0.94
10----------15	30	0.06	1.00
Total	500		

Table (3.22) shows the 51% and 23% ahigh percent of one and five year age of the Child.

Table (3.23): Child Weight

Amount	Frequency	Percent	Cumulative Percent
0----------5	176	0.34	0.34
5----------10	148	0.30	0.64
10----------15	78	0.16	0.80
15----------20	44	0.08	0.88
20----------25	24	0.05	0.93
25----------30	18	0.04	0.97
30----------35	3	0.01	0.98

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

35----------40	9	0.02	1.00
Total	500		

20 Table (3.23) shows that 34% are high presence of the child weight of five kgs, followed by 30% for child weight above five and 10 kgs. Child weight in fact most sensitive to nutritional development, under weight as risk factor. For mortality, birth weight is often is a request. The most factor affecting child morbidity and mortality, also to be used as an indicator of nutritional status.

Table (3.24): Causes of Malaria infection

Type	Frequency	Percent	Cumulative Percent
Mosquitoes	452	90.4	90.4
Malnutrition	25	5.0	95.4
Work Nature	6	1.2	96.6
Other	17	3.4	100.0
Total	500	100.0	

Table 3.24 shows 90.4% of Malaria infection is caused by mosquitoes, followed by malnutrition.

Table (3.25): Meals before Illness

Type	Frequency	Percent	Cumulative Percent
Juice	27	5.4	5.4
Charpohaidirite	108	21.6	27.0
Milk	136	27.2	54.2
Other	229	45.8	100.0
Total	500	100.0	

Table (3.25) shows 45.8 % Meals before Illness contains from others and 27.2 % from milk.

Table (3.26): Meals during Illness

Type	Frequency	Percent	Cumulative Percent
Juice	87	17.4	17.4
Che	50	10.0	27.4
Milk	201	40.2	67.6
Other	126	25.2	92.8
Nothing	36	7.2	100.0

https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Total	500	100.0	

Table (3.26) shows 40.2 % Meals during Illness contains from milk and 25.2 % from others and 17.4 from guise.

Table (3.27): Number of Death Children

Number	Frequency	Percent	Cumulative Percent
.00	327	65.4	65.4
1.00	114	22.8	88.2
2.00	43	8.6	96.8
3.00	8	1.6	98.4
4.00	4	.8	99.2
5.00	3	.6	99.8
6.00	1	.2	100.0
Total	500	100.0	

Table (3.27) while 22.8% lost one child and 8.6% lost two.

Table (3.28): Medical Guidance

Type	Frequency	Percent	Cumulative Percent
Yes	190	38.0	38.0
No	310	62.0	100.0
Total	500	100.0	

Table (3.28) shows 38 % for respondents are taken medical guidance and 62 % are not taken.

Table (3.29): Genetic Diseases

Type	Frequency	Percent	Cumulative Percent
Yes	37	7.4	7.4
No	463	92.6	100.0
Total	500	100.0	

Table (3.29) shows that only 7.4% have genetic diseases. The majority are free from genetic diseases.

International Journal of Financial, Administrative and Economic Sciences, London Vol (3), No (12), 2024
https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

Table (3.30): Places of Human Waste

Type	Frequency	Percent	Cumulative Percent
Dig	44	8.8	8.8
Latrine	333	66.6	75.4
Water close	88	17.6	93.0
Other	35	7.0	100.0
Total	500	100.0	

Table (3.30) shows that two third of the respondents have latrines followed by 17.7% uses water close.

Statistical Test (Cross Tabulation)

The first classification variable is the row variable, and the second classification variable is the column variable. Each cell contains the requested statistics i.e. for each row–column combination. The column headed All contains the row margins. For example, the first number in this column, 35, is the total number of observations in row one. The row headed All contains the corresponding column margins. One can do a chi-square test for association (non-independence) in a two-way classification to test if the probabilities of items or subjects being classified for one variable depend upon the classification of the other variable.

Chi-Square Tests: Three Chi-Square Tests are provided i.e. Pearson, Likelihood Ratio, Linear by Linear Association. The Asymp. Sig. (2-sided) value indicates that there is not strong evidence that first and second variable are related if this value is greater than 0.05 (or greater 0.1). If two one third of the expected counts is less than five, even if one had a significant Asymp. Sig. (2-sided) value for these data, one might interpret the results with skepticism.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.31): Cross tabulation Drinking Water and cause of Malaria

Total	Cause of Malaria					
Count	Other	Work nature	Malnutrition	Mosquitoes		
211	4	3	8	194	Well	Source of Drinking Water
25			2	23	Surface water	
215	8	2	12	192	Canal	
49	2	1	3	43	Other	
500	14	6	25	452		Total

Chi-Square Tests

Asymp. Sig. (2-sided)	df	Value	Chi-Square
.975	15	6.242	Pearson
.931	15	7.802	Likelihood Ratio
.427	1	.630	Linear-by-Linear Association
		500	N of Valid Cases

A 16 cells (66.7%) have expected count less than 5. The minimum expected count is .05.

The first classification variable, Source of Drinking Water, is the row variable, and the second classification variable, Cause of Malaria, is the column variable. The Asymp. Sig. (2-sided) values of Chi squares tests is greater than 0.05 (0.975, 0.931, 0.427) indicate that there is not strong evidence that Source of Drinking Water and Cause of Malaria are related. Note that there are 16 (66.6%) of twenty cells with expected counts less than five. Therefore, even if one had a significant Asymp. Sig. (2-sided) value for these data, one might interpret the results with skepticism.

Table (3.32): 3 Cross tabulation Cause of Malaria and Environment

Total	Cause of Malaria					
Count	Other	Work nature	malnutrition	Mosquitoes		
90	1	2		87	Pools	Pollution
61	1		4	56	Moors	
93	2	1	4	86	sewage	
256	13	3	17	223	Other	
500	14	6	25	452		Total

Chi-Square Tests: a18 cells (75.0%) have expected count less than 5. The minimum expected count is 12.

The first classification variable, Environmental Pollution, is the row variable, and the second classification variable, Cause of Malaria, is the column variable. The Asymp. Sig. (2-sided) values of Likelihood Ratio and Linear by Linear Association Chi squares tests is less than 0.05 (0.03, 0.021) indicate that there is strong evidence that Environmental Pollution and Cause of Malaria are related. Note that there are 18 (75%) of twenty cells with expected counts less than five. Therefore, even if one had a significant Asymp. Sig. (2-sided) value for these data, one might interpret the results with skepticism.

Table (3.33): Cross tabulation between Response and Treatment

Total	Response			
Count	No	Yes		
66	6	60	Chloroquine	Medicine
207	24	183	Quinine	
114	5	109	Fansidar	
29	8	21	Traditional	
84	4	80	Other	
500	47	453		Total

Chi-Square Tests:

Asymp. Sig. (2-sided)	Df	Value	
.001	4	17.927	Pearson Chi-Square
.004	4	15.587	Likelihood Ratio
.420	1	.652	Linear-by-Linear Association
		500	N of Valid Cases

a1cells (10.0%) have expected count less than 5.The minimum expected count is 2.73.

The first classification variable, Medicine, is the row variable, and the second classification variable, Response, is the column variable. The Asymp. Sig. (2-sided) values of Pearson and Likelihood Ratio Chi squares tests is less than 0.05 (0.001,

0.004) indicate that there is not strong evidence that Medicine and Response are related.

Table (3.34): Cross tabulation between Cause of Malaria and Meals before illness

Total	Meal ingredient					
Count	Other	Milk	Charpohaidrate	Juice		
452	196	127	103	26	mosquitoes	Cause of malaria
25	16	5	3	1	malnutrition	
6	6				Work nature	
17	11	4			other	
500	229	136	108	27		Total

Chi-Square Tests:

Asymp. Sig. (2-sided)	Df	Value	
.039	15	25.901	Pearson Chi-Square
.009	15	30.970	Likelihood Ratio
.013	1	6.103	Linear-by-Linear Association
		500	N of Valid Cases

A16 cells (66.7%) have expected count less than 5.The minimum expected count is .05

The first classification variable, Meal before Malaria, is the row variable, and the second classification variable, Cause of Malaria, is the column variable. The Asymp. Sig. (2-sided) values of all Chi squares tests are less than 0.05 (0.039, 0.009, 0.013) indicate that there is strong evidence that Meals before Malaria and Cause of Malaria are related. Note that there are 16 (66.6%) of twenty cells with expected counts less than five. Therefore, even if one had a significant Asymp. Sig. (2-sided) value for these data, one might interpret the results with skepticism.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Table (3.35): Cross tabulation between Cause of Malaria and Meals during illness

Total		Meals during Illness						
Count	34.00	Nothing	other	Milk	Charpohaidrate	Juice		
452	1	32	117	178	48	76	Mosquitoes	Cause of Malaria
25		2	4	12	1	6	Malnutrition	
6		1	4	1			Work nature	
14			1	10	1	5	Other	
500	1	35	126	201	50	87		Total

Chi-Square Tests:

Asymp. Sig. (2-sided)	Df	Value	
.560	25	23.304	Pearson Chi-Square
.467	25	24.916	Likelihood Ratio
.344	1	.897	Linear-by-Linear Association
		500	N of Valid Cases

A 28 cells (77.8%) have an expected count less than5. The minimum expected count is .00.

The first classification variable, Cause of Malaria, is the row variable, and the second classification variable, Meals during Illness, is the column variable. The Asymp. Sig. (2-sided) values of all Chi squares tests are greater than 0.05 (0.560, 0.467, 0.344) indicate that there is not strong evidence that Cause of Malaria and Meals during Illness are related. Note that there are 27 (77.8%) of twenty cells with expected counts less than five. Therefore, even if one had a significant Asymp. Sig. (2-sided)

Value for these data, one might interpret the results with skepticism.

Conclusion and Recommendations

Conclusion

A child's health during the first Five years of life is lamely set by events occurring during the risk malaria. Majority of the risk factors are environmental or malnutrition .In this study majority of child high risk to a demitted malaria causes by Environmental and sanitation program. Mosquitoes and the mother education is in

International Journal of Financial, Administrative and Economic Sciences, London Vol (3), No (12), 2024
https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

satisfaction either illiterate are primary education and the majority of respondents are come from rural an urban housewives.

The results indicate that there are many problems causing malaria even though the respondents emphasis the Environmental more Factor to causes the child malaria or nutrition needed. The result slowed that the common complications are infection and all respondents suffer from infection by malaria and the 25% is infection more than two time and 24% more than three time and 20% is once time and the result indicate that the majority child illness related to the weight of child and bleeding disorder, convulsion malaria, noun immunization, not vaccination.

While the time is very important determinant for child to take more time from decision to seeking care to admission. While the feeding of the child is very important for growth and development, and it is essential for child borne survival. The results showed 13% is for one child borne survive and two child borne survive .The result showed that correlation between causes of malaria and mesh significant relationship between them

Recommendations

It is very important to design a plan and strategies through which to improve the care of malaria with critical care condition in order to reduce the risk of disease and morbidity and mortality.

Obliviously from the study there is morbidity and mortality in While Nile state may reflect the in equity of health services and lack of awareness of respondents. Therefore, the study attempts to give recommendations to policy make is and those who are working in health sector.

The recommendations are:

1. All children with access to vaccination and child health, this will indicate where special care is needed. it should serve as an entry points to health care, health education and child survival strategy
2. How to identify children at risk of infection by malaria, should be part of all basic training curriculums and retraining programs for all doctors and primary health care workers.
3. Integrate previous medical – surgical knowledge and skills with new knowledge in order to assess diagnose, Plan, Treat, and evaluate evidenced – based childcare home are infection by malaria.
4. It concerns environmental factors to avoid or to reduce the causes of infection by malaria so as source of drinking water, energy, sanitation program and mosquito and malnutrition, labor nature.
5. According to the empirical results, the study concludes that rural areas were found to be more affected by malaria than urban areas.
6. We consider that malaria severity could be reduced by improving peripheral health facilities, educating mother on malaria home management and providing appropriate education to communities to avoid delay in seeking treatment, the control strategy should consider the different epidemiological context in different states in Sudan.

References

1. Annual Statistical Report. Khartoum, Health Information Center, Federal Ministry of Health, 2002:36–64.
2. Ameka. Emmanuel Okafor and Jimoh Amzat, 2001, importance of antimalarial drug resistance medical and international health.
3. Children and malaria, region, Mali. Tropical medicine & international health, 2000.

4. Emeka Emmanuel Okafor and Jimoh Amzat, Problems of Malaria Menace and Behavioral Intervention for its Management in Sub-Saharan Africa, Department of Sociology, University of Ibadan, Ibadan, Nigeria, Volume 12 No 6 November 2006.
5. Jones, C. H. and Williams, H. A.: The social burden of malaria: What are we measuring? American. Journal of Tropical. Medicine and Hygiene, 71 (2): 156-
6. WHO expert committee on malaria. Availability and quality of treatment. Geneva, World Health Organization, 2000:24–5 (WHO Technical Report Series 2000, No. 892).
7. World health organization, 1999., the Who report making a difference, Geneva
8. Who. World health organization, 2001, Economic analysis indicate that the burden of malaria is great.
9. World health organization (2001), Guidelines on other use of insecticide treated mosquito nets for the prevention control of malaria in Africa.
10. Z. Zeidan, 1 H. Kojal, 2 A. Habour, 3 K. Nowary, 4 F. Hashim 5 and M. Awadelkarim1, Clinical and epidemiological features of severe malaria in children in four hospitals in Sudan.volime-12-2006.

International Journal of Financial, Administrative, and Economic Sciences (IJFAES)
Vol. (3), No. (12)
IJFAES
December 2024
المجلة الدولية للعلوم المالية والإدارية والاقتصادية
الإصدار (3)، العدد (12)

Research Appendix

1. Age of the Mother:
2. Number of Male children:
3. Number of Female Children:
4. Years of Schooling:
   1-Illiterate 2- Khalwa 3- Basic 4- Secondary 5- Graduate
5. Spending Per Month:
   1-0 -------200 2- 200------400 3- 400------600 4- 1000 & above –
6. Monthly Spending on Medical Treatments:
   1-0----------502-50----------100 3-100----------1504-200 & above
7. Monthly Income before Malaria:
   1-0 ----------200 2-200----------400 3-400----------600 4- 1000 & above
8. Health Insurance:
   1-Yes 2- No
9. Residence:
   1- Town 2- Village 3- Manara
10. House Ownership:
    1- Owned 2- Hired 3- Other
11. Relation with Residence:
    1-Resident 2- Displaced 3- Mobile 4- Expatriate 5- Other
12. House Type:
    1- Cement 2- Red Bricks 3- Mud 4- Other
13. Source of Drinking Water:
    1- Well 2- Surface Water 3- Canal 4- Other
14. Source of Energy:
    1- Fire Wood 2- Charcoal 3- LPG 4- Electricity
15. Sanitation Program:
    1-Yes 2- No
16. Environment pollution:
    1- Pools 2- Moors 3- Sewage 4- Other
17. Age of the Child:
    1-0----------1 2- 1----------5 3-5----------10 4- 10----------15
18. Child Weight:
    1-0----------52- 5----------10 3-10----------15 4- 15----------20

International Journal of Financial, Administrative and Economic Sciences, London Vol (3), No (12), 2024
https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498

19. Causes of Malaria infection:
    1- Mosquitoes 2- Malnutrition 3- Work Nature 4- Other
20. Type of Malaria Treatment:
    1-Chloroquine 2- Quinine 3- Fansidar 4- Traditional 5- Other
21. Method of treatment:
    1-Pills 2- Injection 3- Traditional 4- 4-0 Other
22. Child Response:
    1-Yes 2- No
23. Distance of Place of Medical Care:
    1-Yes 2- No
24. Cost of Treatment:
    1- High 2- Intermediate 3- Low 4- Free 5- Other
25. Meals before Illness:
    1- Milk 2-Juice 3-charpohaidirite 4- Other
26. Meals During Illness:
    1-Milk 2-Juice 3-charpohaidirite 4- Other
27. Number of Dead Children:
    1-0----------52- 5----------10 3-10----------15 4- 15----------20
28. Medical Guidance:
    1-Yes 2- No
29. Genetic Diseases:
    1-Yes 2- No
30. Places of Human Waste:
    1-Dig 2- Latrine 3- Water close 4- Other

https://doi.org/10.59992/IJFAES.2024.v3n12p8 E-ISSN 2977-1498