IJSBAR

International Journal of

Sciences: Basic and Applied Research

ISSN 2307-4531
(Print & Online)

Published by:

GSRON

Visit: www.gsron.org

International Journal of Sciences: Basic and Applied Research (IJSBAR)

Editorial Team

Editor In Chief

Associate Professor Mohammad Othman, Global Society of Scientific Research and Researchers

Executive Managing Editor

Associate Professor Mohammad Othman, Global Society of Scientific Research and Researchers

Coordinating Editor

Dr. Daniela Roxana Andron, Departamentul Drept Privat ?i ?tiin?ele Educa?iei, Universitatea Lucian Blaga din Sibiu, http://dppd.ulbsibiu.ro, http://drept.ulbsibiu.ro/centrul-ccap, tel. +40-269-211 602, fax +40-269-235 224., Romania

Section Editors

Prof. Dr. Indrani Pramod Kelkar, Department of Mathematics,Chief Mentor, Acharya Institute of Technology, Soldevanahalli, Hesaraghatta Main Road, Banavara Post, Bangalore- 560 107. Cell : 9164685067, India
Prof. Dr. Felina Panas Espique, Professor, School of Teacher Education, Saint Louis University, Baguio City. Dean of the School of Teacher Education. Bonifacio St., Baguio City, 2600, (074) 447-0664 (landline), Mobile Number 099-897-63236., Philippines
Prof. Dr. Hye-Kyung Pang, Business Administrations Department, Hallym University, #1, Ockcheon-dong, Chooncheon-si, Kangwon-do, (office) 82-33-248-3312/ (cell) 82-10-5311-6131, Korea, Republic of

Layout Editors & Copyeditors

Dr. Nimish H. Vasoya, Head - General Department SANJAYBHAI RAJGURU COLLEGE OF ENGINEERING (Previously Om Shanti Engineering College), Sanjaybhai Rajguru Education Zone, At-Hadmatia (Bedi), Morvi Road, Rajkot-360 003, India
Dr. Florian Marcel Nuta, Faculty of Economics/Danubius University of Galati, Romania
Dr. Lowida L. Alcalde, Suzhou North America High School, China, Philippines

Editorial Board Members and Reviewers

Associate Professor Mohammad Othman, Global Society of Scientific Research and Researchers
Prof. Dr. Ayhan Esi, Adiyaman University, Science and Art Faculty, Department of Mathematics, Turkey
prof. Dr. Abdul Haseeb Ansar, International Islamic University, Kuala Lumpur, Malaysia
Prof. Dr. Felina Panas Espique, Professor, School of Teacher Education, Saint Louis University, Baguio City. Dean of the School of Teacher Education. Bonifacio St., Baguio City, 2600, (074) 447-0664 (landline), Mobile Number 099-897-63236., Philippines
Prof. Dr. Indrani Pramod Kelkar, Department of Mathematics,Chief Mentor, Acharya Institute of Technology, Soldevanahalli, Hesaraghatta Main Road, Banavara Post, Bangalore- 560 107. Cell : 9164685067, India
Prof. Dr. Samir El-Sherif, College of Agriculture, Cairo University, Egypt
Prof. Dr. Hye-Kyung Pang, Business Administrations Department, Hallym University, #1, Ockcheon-dong, Chooncheon-si, Kangwon-do, (office) 82-33-

248-3312/ (cell) 82-10-5311-6131, Korea, Republic of
Prof. Dr. Aghareed M. Tayeb, Chemical Engineering Dept., Faculty of Engineering, Minia University Minia, Egypt
Prof. Dr. Hamed Hmeda Kassem, Department of Zoology , Faculty of Science, Benghazi University, Libya
Prof. Dr. Ramel D. Tomaquin, Dean, CAS Surigao Del Sur State University Tandag City Surigao Del Sur, Philippines
Prof.Dr. Amer Abdulrahman Taqa, basic science Department ,College of Dentistry, Mosul University, Iraq
Prof. Dr. Maria Luisa A. Valdez, Dean of Colleges and Head of Graduate School, Batangas State University ARASOF Nasugbu Campus, Nasugbu, Batangas, Philippines
Prof. Dr. Iryna Morozova, Romance-Germanic Faculty, Odesa Mechnikov University, Ukraine
Prof. Dr. Manu Rathee, Head of Department Department of Prosthodontics and Crown & Bridge Post Graduate Institute of Dental Sciences Pt. B. D. Sharma University of Health Sciences Rohtak, Haryana, India
Prof. Dr. Mahmoud Younis Mohammed Taha, Department of Dental Basic Sciences, College of Dentistry, Mosul University, Iraq
Prof. Dr. Akbar Masood, Dean, Faculty of Biological Sciences Head, Department of Biochemistry, the University of Kashmir, India
Asso. Prof. Mario Amar Fetalver, College of Arts & Sciences, Romblon State University, Philippines
Asso. Prof. Fateh Mebarek-Oudina, , Algeria
Asso. Prof. Zakaria Ahmed, PRIMEASIA UNIVERSITY, MICROBIOLOGY DEPARTMENT, HBR TOWER, 9 BANANI, DHAKA 1213, Bangladesh
Associate Professor Zaira Wahab, Iqra University, Pakistan
Associate Professor. Dr. KULDEEP NARAIN MATHUR, SCHOOL OF QUANTITATIVE SCIENCE, UNIVERSITI UTARA MALAYSIA, Malaysia
Asso. Prof. Evangelos P. Hinis, National Technical University of Athens - NTUA, Greece
Asso. Prof. Girish Chandra Mishra, O.P.Jindal Institute of Technology,Raigarh(C.G., India
Dr. Houshmand E. Masoumi, Center for Technology and Society, Technical University of Berlin, Germany
Dr. Esther Patrick Archibong, Dept. of Sociology, University of Calabar, Nigeria
Dr. Christina De Simone, Faculty of Education, University of Ottawa.333 Chapel Street, Suite 305, Ottawa, Ontario, K1N 8Y8, tel. 613-562-5800,4112., Canada
Dr. Hulela Keba, Botswana College of Agriculture Faculty of Agriculture Private Bag 0027. Gaborone., Botswana
Dr. Nimish H. Vasoya, Head - General Department SANJAYBHAI RAJGURU COLLEGE OF ENGINEERING (Previously Om Shanti Engineering College), Sanjaybhai Rajguru Education Zone, At-Hadmatia (Bedi), Morvi Road, Rajkot-360 003, India
Dr. Joseph Djeugap Fovo, University of Dschang, Faculty of Agronomy and Agricultural Science (FASA) Department of Plant Protection, Plant Pathology Laboratory, Cameroon
, , Philippines
Dr. Ankur Rastogi, O.P.Jindal Institute of Technology, Raigarh(C.G.), India
Dr. Daniel Hailegiorgis Haile, Wollo University, Dessie, Ethiopia
Dr. Aleksandra K. Nowicka, MD Anderson Cancer Center, Houston, Texas, United States
Dr. Fazal Shirazi, MD Anderson Cancer Center, Texas, United States
Dr. Tahira Naz, Centre of excellence in Marine biology, karachi University pakistan., Pakistan
Dr. Daniela Roxana Andron, Departamentul Drept Privat ?i ?tiin?ele Educa?iei, Universitatea Lucian Blaga din Sibiu, http://dppd.ulbsibiu.ro, http://drept.ulbsibiu.ro/centrul-ccap, tel. +40-269-211 602, fax +40-269-235 224., Romania
Dr. Kabita Kumari Satapathy, O.P.Jindal Institute of Technology,Raigarh, C.G., India
Dr. Chandan Kumar Sarkar, IUBAT- International University of Business Agriculture and Technology, Bangladesh
Dr. AZAD ALI, Department of Zoology, B.N. College, Dhubri, India
Dr. Narayan Ramappa Birasal, , India
Dr. Rabindra Kayastha, Kathmandu University, Nepal
Dr. Rasmeh Ali AlHuneiti, Brunel university, United Kingdom
Dr. Florian Marcel Nuta, Faculty of Economics/Danubius University of Galati, Romania
Dr. Salman Shahza, Institute of Clinical Psychology, University of Karachi, Pakistan
Dr. Suchismita Satapathy, School of Mechanical Engineering, KIIT University, India
Dr. Lowida L. Alcalde, Suzhou North America High School, China, Philippines
Dr. Juliana Ajdini, Department of Social Work and Social Policy, Faculty of Social Science, University of Tirana, Albania
Dr. Arfan Yousaf, Department of Clinical Sciences, Faculty of Veterinary and Animal Sciences, PMAS-Arid Agriculture University Rawalpindi .Pakistan ,, Pakistan
Dr. Rajamohan Natarajan, Chemical Engineering |Faculty of Engineering, Sohar university, Oman

International Journal of Sciences: Basic and Applied Research (IJSBAR)

Journal Contact

Mailing Address

International Journal of Sciences: Basic and Applied Research (IJSBAR)is published by the Global Society of Scientific Research and Researchers (GSSRR):

Emaile: info@gssrr.org

Global Society of Scientific Research and Researchers (GSSRR) site and all related journals are owned by a registered company in Jordan under the number 330811, the company national number is 100439452.

Office Hours: 24 hours

Before contacting us, please read our FAQs For the journal.

Principal Contact

Dr. Mohammad Nasar
Editor In Chief
Global Society of Scientific Research and Researchers.
Phone: Phone: 00962788780593
Email: editorijsbar2@gssrr.org

Support Contact

Rabindra Corat Kayastha
Email: support@gssrr.org

International Journal of Sciences: Basic and Applied Research (IJSBAR)

About the Journal

People

- Contact
- Editorial Team

Policies

- Focus and Scope
- Section Policies
- Peer Review Process
- Publication Frequency
- Subscriptions
- Publication Ethics and Publication Malpractice Policy
- Papers/ manuscript evaluation criteria
- Processing Charges
- Join the IJSBAR Journal as as Reviewer
- Plagiarism Policy
- Open Access statement
- Process for identification of and dealing with allegations of research misconduct
- Conflict of interest Policy (COIP)

Submissions

- Online Submissions
- Author Guidelines
- Copyright Notice
- Privacy Statement
- Author Fees

Other

- Journal Sponsorship
- Site Map
- About this Publishing System

About IJSBAR:

The International Journal of Sciences: Basic and Applied Research (IJSBAR) is the scientists open access homeland for publishing their scientific papers in Basic and Applied sciences and Research. IJSBAR plays its role as a refereed open access international journal to support the universal universities, research institutes, and researchers in their journey toward publishing their research papers. this journal accept scientific papers after sending them to well known academic reviewers; our reviewers will Apply basic double - blind refereeing process according to the international research standards for publishing scientific researches.

It should be clear for all scientists that submitting articles to this journal of Basic and Applied Research will guarantees that the papers will be refereed basically by our journal reviewers and scientists to decide about the publication in the IJSBAR journal according to the following basic options:

- Accept the Basic and Applied paper/papers for publication in IJSBAR without any basic modifications.
- Accept the paper/papers for publication in the Sciences journal with modifications to be applied.

- Reject the Applied research paper/ research papers.

The IJSBAR published papers in Basic and Applied Research will be available for scientific readers for free, no fees are required to download and read any published Basic and Applied idea in this international journal.

The Sciences covered by this journal are (but not limited): chemical sciences, All fields of Engineering, computer science, medical research, physiology, Mathematics, Social Science, Geology, all areas of applied sciences, biotechnology.

The IJSBAR is now under consideration for indexing in Thomson Reuters (ISI).

The IJSBAR Published Papers **are Indexed, listed, and abstracted in**:

Ulrich, Google Scholar , Directory of Open Access Journals (DOAJ) , Ulrich's Periodicals Directory, Microsoft academic research, University of Texas (USA) , Stanford University (USA), State University Libraries of Florida (included in 11 universities libraries in Florida)(USA), University of Cambridge (United Kingdom), Simon Fraser University (Canada), University of South Australia (Australia), OAIster database, PubZone (ACM SIGMOD), Research gate, OCLC World Cat, IE Library (Spain), Elektronische Zeitschriftenbibliothek (Ezb germany), Simpson University (USA), Columbia University (USA), NEOS library consortium (Canada), University of Melbourne (Australia), Technische Universität Darmstadt (Germany), University of Gronignen (The Netherlands), University of Liverpool (UK), Universität Wurzburg (Germany), Academic research (ourGlocal), Issuu, Researchbib, Journal seek,docstoc, ProLearnAcademy, ectel07, University of Canterbury (New Zealand), University of Hong Kong, Queen's University (Canada), Universität Mainz (Germany), University of Saskatchewan (Canada), The Hong Kong University of Science & Technology, University of Manitoba (Canada), Auckland University of Technology (New Zealand), scribd, prorch, slideshare, mendeley, academia, Genamics JournalSeek, Internet archive, Ebookbrowse, CiteSeer, Physikalisch Technische Bundesanstalt (Germany), University of Twente (The Netherlands), Universität Osnabrück (Germany), Universität Marburg (Germany) , University of IOWA (USA).

IJSBAR International Journal of Sciences: Basic and Applied Research (IJSBAR)

Vol 36, No 2 (2017)

Table of Contents

Articles

International Journal of Sciences: Basic and Applied Research (IJSBAR)

Anemia Prevalence and Nutrition Status of Malaria Falciparum Children Patients Staying in Malaria

Lia Amalia, Laksmyn Kadir

Abstract

The prevalence of malaria in Indonesia is still high, reaching 417,819 positive cases in 2012, currently 70 percent of malaria cases are found in eastern Indonesia. Malaria endemic areas in eastern Indonesia, spread over 84 districts / cities with a population of 16 million people at risk. The level of malaria endemicity in Gorontalo is done based on AMI and API size. The purpose of this study was to determine the prevalence of anemia and nutritional status of children with malaria. This was an observational analytic study with cross sectional study design. The sample is 105 children aged 7-12 years in SDN 5 East Sumalata. The independent variable is the incidence of anemia and nutritional status and the dependent variable is the incidence of malaria. The results showed anemia prevalence of 57,1% with mean Hb (10,6 gr / dL) and was in very mild anemia classification and for the most nutritional status with normal nutrition status was 87,6%. by using Chi-Square statistic test with 95% significance (α = 0,05) showed that there was correlation between occurrence of anemia with malaria incidence (χ2 = 40,082 p value 0,000) and no relationship between nutritional status and malaria incidence (χ2 = 1,495 p value 0.301), it is advisable to disseminate malaria-related information and anemia through increased knowledge of malaria, run iron supplementation programs and food fortification programs.

Keywords

Malaria; anemia; nutrition status.

Full Text:

PDF

References

Kementerian Kesehatan RI. Epidemilogi Malaria di Indonesia. Buletin Jendela Data dan Info Kesehatan. 2011

Depkes RI, Epidemiologi Malaria, Direktorat Jenderal PPM-PL, Departemen Kesehatan RI, Jakarta 2003.

WHO., 2015. World Malaria Report 2014, World Health Organization, Geneva, Switzerland, ISBN-13978924156518, Pages 243

Indarti, D. N, 2010. Faktor-faktor yang berhubungan dengan kejadian malaria pada pasien rawat inap di BLUD.RSU.Dr.M.M.Dunda Kabupaten Gorontalo Tahun 2010.

Das R, Khan PN, Amir A. Epidemiologi Asessment of The Tren of Malaria in Rural Western U'P. Indian J Community Med. 2004;29 (3): 134-135

Datau, S. 2010. Faktor-faktor yang berhubungan dengan kejadian malaria di wilayah Puskesmas Paguyaman Kecamatan Paguyaman Kabupaten Boalemo Tahun 2010.

Lubis, FA., 2008. Efikasi gabungan klinis-doksisiklin pada pengobatan malaria falciparum tanpa komplikasi pada anak, Thesis. Universitas Sumatra Utara, Meda, Indonesia

Harijanto, P., 2011 Tata Laksana Malaria untuk Indonesia, Jakarta; Buletin, Kementerian Kesehatan RI

Rahayu, S, M, 2010. Faktor-faktor yang berhubungan dengan kejadian malaria di wilayah Puskesmas Paguyaman Kecamatan Paguyaman Kabupaten Boalemo Tahun 2010.

Dinas Kabupaten Gorontalo Utara, 2016, data penderita malaria, Gorontalo Utara

Notoadmodjo, S. 2007. " Perilaku Kesehatan". Rineka Cipta. Jakarta.

Puskesmas Sumalata Timur, 2017, Data penderita malaria, Gorontalo Utara.

Refbacks

- There are currently no refbacks.

ABOUT THE AUTHORS

Lia Amalia
Public Health Studies Program, FOK, Gorontalo University, Gorontalo, Indonesia, 085240256079

Laksmyn Kadir
Public Health Studies Program, FOK, Gorontalo University, Gorontalo, Indonesia, 085240256079

International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

http://gssrr.org/index.php?journal=JournalOfBasicAndApplied

Anemia Prevalence and Nutrition Status of Malaria Falciparum Children Patients Staying in Malaria Endemical Area

Lia Amalia[a*], Laksmyn Kadir[b]

[a,b]*Public Health Studies Program, FOK, Gorontalo University, Gorontalo, Indonesia, 085240256079*

[a]*Email: lia.amalia29@gmail.com*

Abstract

The prevalence of malaria in Indonesia is still high, reaching 417,819 positive cases in 2012, currently 70 percent of malaria cases are found in eastern Indonesia. Malaria endemic areas in eastern Indonesia, spread over 84 districts / cities with a population of 16 million people at risk. The level of malaria endemicity in Gorontalo is done based on AMI and API size. The purpose of this study was to determine the prevalence of anemia and nutritional status of children with malaria. This was an observational analytic study with cross sectional study design. The sample is 105 children aged 7-12 years in SDN 5 East Sumalata. The independent variable is the incidence of anemia and nutritional status and the dependent variable is the incidence of malaria. The results showed anemia prevalence of 57,1% with mean Hb (10,6 gr / dL) and was in very mild anemia classification and for the most nutritional status with normal nutrition status was 87,6%. by using Chi-Square statistic test with 95% significance (α = 0,05) showed that there was correlation between occurrence of anemia with malaria incidence ($\chi 2$ = 40,082 p value 0,000) and no relationship between nutritional status and malaria incidence ($\chi 2$ = 1,495 p value 0.301), it is advisable to disseminate malaria-related information and anemia through increased knowledge of malaria, run iron supplementation programs and food fortification programs.

Keywords: Malaria; anemia; nutrition status.

---

* Corresponding author.

1. Introduction

Malaria is an endemic disease that is common throughout the world, especially in the tropics. The groups at risk for exposure are children and pregnant women. The problem of malaria is one of the points discussed and set in the 2015 Millennium Development Goals (MDGs) agreement on the sixth point of resistance against HIV / AIDS, malaria and other diseases. Likewise, in the 60th World Health Assembly (WHA) meeting on May 18, 2007, there has been a global commitment to the elimination of malaria for every country. The guidelines for the implementation of malaria elimination have been formulated by the World Health Organization (WHO) in the Global Malaria Program [1, 2]. The MDGs program continues to demonstrate the success shown by the Annual Parasite Incidence (API) of malaria in Indonesia which has continued to decline since 2011-2015. In 2011, there were 1.75 cases of malaria per 1000 population, whereas in 2015, the number decreased to 0.85 malaria cases per 1000 inhabitants.

WHO [3] recorded incidences of malaria incidence in 2013 of approximately 198 million cases with deaths of approximately 584,000 cases (case fatality rate = CFR = 0.29%). The highest risk of transmission occurs in the African region with a total estimated death of about 528,000 cases (0.32%). The WHO 2014 report estimates that 3.3 billion people are at risk of being infected with malaria where its 1.2 billion is at risk with Annual Parasite Incidence (API)> 1 per 1000 population. Plasmodium falciparum and vivax are the most common plasmodium found worldwide.

The prevalence of malaria in Indonesia is still high, reaching 417,819 positive cases in 2012. Currently, 70 percent of malaria cases are found in eastern Indonesia, especially in Papua, West Papua, Maluku, North Maluku, Sulawesi and Nusa Tenggara, malaria endemic areas in Eastern Indonesia , spread over 84 districts / cities with a population of 16 million people at risk. Determination of malaria endemicity level in Gorontalo area is done based on Annual Malaria Incidence (AMI) and API. The value of AMI for malaria patients in Gorontalo Province, especially in the North Gorontalo is 9.3% and API 1.54%. The national standard of malaria endemicity determination in a region is said to be low if API <1%, AMI <25%, while API 1-5% or AMI 25 - 50% and high endemicity if API> 5% or AMI> 50%. Based on these standards, North Gorontalo is located at a moderate level of endemicity.

2. Materials and Methods

This research was conducted at SDN 5 East Sumalata. This was an observational analytic study with cross sectional study design. The sample was 105 children aged 7-12 years. All the children were taken of blood and examined malaria microscopically and by Immunochromatographic Test (ICT). From the number of students who got 105 positive children malaria falciparum 79 people (75.2%). Positive samples counted the number of parasitemia and then the students who tested positive were given treatment with anti-malarial drugs ie Artemisinin Combination Therapies (ACT) and antacids to avoid nausea caused by taking malaria drugs and respondents are parents of children.

Dependent variable in this study is the incidence of malaria namely the respondents whose blood test results

showed positive results of one or a combination of plasmodium malaria from laboratory examination with a microscope, while the independent variables in this study is the incidence of anemia and nutritional status. The variable of occurrence of anemia is the occurrence of malaria based on Haemoglobin examination that is normal if the examination is 10,8-13,6 gr / dL, and for nutritional status based on the calculation of body mass index (IMT).

Data on the incidence of malaria, the incidence of anemia and nutritional status were taken at the time of laboratory examination. Data were analyzed using Chi-square test with 95% significance ($\alpha = 0,05$).

3. Results

Malaria is a highly contagious infectious disease in the tropics and sub-tropics and can be deadly. At least 270 million people of the world suffer from malaria and more than 2 billion or 42% of the population of the earth has a risk of malaria. WHO notes every year that no less than 1 to 2 million people die from Anopheles mosquito-borne diseases. The source of infection for humans is another human who suffers from malaria with no symptoms or clinical symptoms. In endemic areas malaria-affected children have not developed immunity to malaria in their bodies when compared with adults, so the severity of malaria will be more severe. Conversely in areas with low endemicity, adults do not have the same sensitivity and severity as children and migrants from non-endemic areas of malaria.

Based on the research that has been done on 105 samples, the following research results are presented:

Table 1: Description of the variables studied (incidence of malaria, age, sex, educational level, occurrence of anemia and nutritional status) in students at SDN 5 East Sumalata

Variabel	n	%
Malaria occurrence		
Malaria	79	75,2
Not Malaria	26	24,8
Age :		
7-9 year	22	20,9
10-12 year	83	79,1
Sex		
Female	39	37,1
Male	66	62,9
Parents education level		
Basic school	25	23,8
Junior high school	57	54,3
Senior high school	21	20,0
Higher education	2	1,9
Anemia occurrence		
Anemia	60	57,1
Normal	45	42,9
Nutrition Status		
Less	13	12,4
Normal	92	87,6
Number	105	100,0

Table 2: Description of the variables studied (age, gender, parental education level, occurrence of anemia, and nutritional status,) with malaria incidence in students at SDN 5 in East Sumalata

Variabel	Malaria	Not Malaria	Number
Age :			
7-9 year	17 (21,5%)	5 (19,2%)	22 (20,9%)
10-12 year	62 (78,5%)	21 (80,8%)	83 (79,1%
Sex			
Female	30 (38,0%)	9 (34,6%)	39 (37,1%)
Male	49 (62,0%)	17 (65,4%)	66 (62,9%)
Parents education level			
Basic school	21 (26,6%)	4 (15,4%)	25 (23,8%)
Junior high school	46 (58,2%)	11 (42,3%)	57 (54,3%)
Senior high school	11 (13,9%)	10 (38,5%)	21 (20,0%)
Higher education	1 (1,3%)	1 (3,8%)	2 (1,9%)
Anemia occurrence			
Anemia	59 (74,7%)	1 (3,8%)	60 (57,1%)
Normal	20 (25,3%)	25 (96,2%)	45 (42,9%)
Nutrition Status			
Less	8 (10,1%)	5 (19,2%)	13 (12,4%)
Normal	71 (89,9%)	21 (80,8%)	92 (87,6%)
Number	79 (75,2%)	26 (24,8%)	105 (100,0%)

From table 1 shows that out of 105 samples, there were 79 students (75.2%) who were malaria positive and 26 students (24.8%) were not malaria. Based on the age variable, it was found that most samples were 10-12 years old, 83 students (79,1%) and gender were 66 men (62,9%). For parents education level variable, most with last education junior high which is 57 people (54,3%). For the occurrence of anemia, most of the sample with Hb level <10,8 gr / dL that is 60 students (57,1%) while for nutrition status, most with normal nutrition status is 92 students (87,6%).

The result of this study also found that based on gender, malaria positive and non malaria, male was the most of the 49 students (62,0%) and 17 students (65,4%). Based on the variable of education level of parents showed that malaria positive and not malaria, low education level (≤ junior high school) is the highest level of education, each of 67 students (84.8%) and 15 students (57.7%). Based on the incidence of anemia, the malaria samples were distributed at Hb <10,8 gr / dL ie 59 students (74,7%) and non-malaria were distributed at normal Hb level of 25 students (96,2%) . Based on data analysis using Chi-Square statistical test obtained $\chi 2$ count 40.082> value $\chi 2$ table 3,841. Because $\chi 2$ count> $\chi 2$ table and p value value (0,000 <α 0.05) this means that H0 is rejected means there is a significant relationship between anemia and malaria incidence.

Table 3: Results of Independent Variables and Dependent Variables

Variabel	χ^2	*p* value
Anemia occurrence	40,082	0,000
Nutrition Status	1,495	0,301

For nutritional status variables, malaria and non-malaria samples were distributed in normal nutrition, 71 students (89.9%) and 21 students (80.8%) and based on data analysis using Chi-Square statistical test obtained $\chi 2$ 1,495 <value $\chi 2$ table 3,841. Since $\chi 2$ count $<\chi 2$ table and p value (0.301> α 0.05) this means that H0 accepted means there is no significant relationship between nutritional status and malaria incidence.

4. Discussion

4.1 Relationship Level of Parents Education with Malaria Incidence

The results of analysis using Chi-Square statistical test obtained $\chi 2$ count 8.409> value $\chi 2$ table 3,841. Since $\chi 2$ count> $\chi 2$ table and p value (0,000 $<\alpha$ 0.05) this means that H0 is rejected means there is a significant relationship between parent education level and malaria incidence. Parents education is one important factor in determining the growth of children, because with good education then parents can receive all information from outside, especially on how to care for good, how to maintain health of children's health, education, diet and so forth. The level of education affects the knowledge of a person, in general, people who have a high level of education easier to know about malaria because it is easier to understand information about malaria. The result of the research shows that malaria occurrence is mostly happened in the sample having low educated parents ($\leq$ SMP). This shows the low knowledge of parents about malaria.

Parents education level will greatly affect the level of knowledge and behavior of parents in maintaining the health of their children. Higher education can improve health behaviors and help prevent disease. A good level of education will affect the behavior of parents who lead to preventive measures of transmission of malaria. This study is in line with research conducted by Indarti [4] where low-educated people are at high risk of contracting malaria. In educational theory is a process that will result in a change in target behavior that is expected by a particular organization by providing formal or informal education to its members.

4.2 The Relationship of the Genesis of Anemia with Malaria Occurrence

In this study to determine the anemia examined levels of hemoglobin (Hb). Hb levels of children in this study varied from 8.2 to 13.6 g / dL with an average Hb of 10.7 g / dL and were in very mild anemia classification. The results showed that the malaria samples were distributed at Hb <10,8 gr / dL ie 59 students (74,7%) and non-malaria were distributed at normal Hb level of 25 students (96,2%). Based on the data analysis using Chi-Square statistical test, the result of $\chi 2$ 40,082 and p value (0,000 $<\alpha$ 0,05) means there is a significant correlation between anemia and malaria incidence.

Malaria parasites as well as all organisms need nutrients for their survival and the nutrients themselves can be obtained from environments that are then converted to other molecules or energy (catabolism). Other molecules and this energy will be used to maintain homeostasis, growth and reproduction of the parasite (anabolism). Energy sources are proteins. Malaria parasites require amino acids to synthesize their proteins. One source of amino acids is hemoglobin. Hemoglobin is an abundant protein in cytoplasmic erythrocytes that serves as a major source of parasitic amino acids [5,6]. Although the area of Dulukapa village is a coastal area that consumes a lot of fish that is a high source of iron, but the incidence of anemia is also high this is probably due

to low nutrients intake that can help the absorption of iron. The main factor that can help the absorption of iron is vitamin C (ascorbic acid).

4.3 Relationship of Nutritional status with Malaria Incidence

For nutritional status variables, malaria and non-malaria samples were distributed in normal nutrition, 71 students (89.9%) and 21 students (80.8%) and based on data analysis using Chi-Square statistical test obtained $\chi 2$ 1,495 <value $\chi 2$ table 3,841. Since $\chi 2$ count $<\chi 2$ table and p value (0.301> α 0.05) this means that H0 accepted means there is no significant relationship between nutritional status and malaria incidence. In this study most children have good nutritional status when viewed based on body weight per height. This is in line with preliminary studies conducted in malaria endemic areas in Africa, it turns out that children with good nutritional status are more likely to suffer from malaria than those with mild, moderate and severe nutritional status [7-9]. This suggests that nutritional status is not associated with malaria incidence, children with moderate-to-severe malnutrition increased the risk for malaria infection despite the insignificant results that may be due to the role of micronutrients such as iron, zinc and vitamin A in immunity to malaria [10-12].

5. Conclusion

Based on the result of the research, it can be concluded that the prevalence of anemia is 57,1% with mean Hb (10,7 gr / dL) and is in very mild anemia classification and for the most nutritional status with normal nutrition status is 87 , 6%. there was a correlation between the incidence of anemia and the incidence of malaria ($\chi 2$ = 40,082 p value 0,000) and no relationship between nutritional status and malaria incidence ($\chi 2$ = 1,495 p value 0,301 in SDN 5 in East Sumalata of North Gorontalo Regency .

6. Suggestion

The results of this study can be used as one of the considerations in prevention malaria in children, disseminates information related to malaria and anemia through increased knowledge of malaria, runs iron supplementation programs and food fortification programs.

References

[1] Kementerian Kesehatan RI. Epidemilogi Malaria di Indonesia. Buletin Jendela Data dan Info Kesehatan. 2011

[2] Depkes RI, Epidemiologi Malaria, Direktorat Jenderal PPM-PL, Departemen Kesehatan RI, Jakarta 2003.

[3] WHO., 2015. World Malaria Report 2014, World Health Organization, Geneva, Switzerland, ISBN-13978924156518, Pages 243

[4] Indarti, D. N, 2010. Faktor-faktor yang berhubungan dengan kejadian malaria pada pasien rawat inap

di BLUD.RSU.Dr.M.M.Dunda Kabupaten Gorontalo Tahun 2010.

[5] Das R, Khan PN, Amir A. Epidemiologi Asessment of The Tren of Malaria in Rural Western U'P. Indian J Community Med. 2004;29 (3): 134-135

[6] Datau, S. 2010. Faktor-faktor yang berhubungan dengan kejadian malaria di wilayah Puskesmas Paguyaman Kecamatan Paguyaman Kabupaten Boalemo Tahun 2010.

[7] Lubis, FA., 2008. Efikasi gabungan klinis-doksisiklin pada pengobatan malaria falciparum tanpa komplikasi pada anak, Thesis. Universitas Sumatra Utara, Meda, Indonesia

[8] Harijanto, P., 2011 Tata Laksana Malaria untuk Indonesia, Jakarta; Buletin, Kementerian Kesehatan RI

[9] Rahayu, S, M, 2010. Faktor-faktor yang berhubungan dengan kejadian malaria di wilayah Puskesmas Paguyaman Kecamatan Paguyaman Kabupaten Boalemo Tahun 2010.

[10] Dinas Kabupaten Gorontalo Utara, 2016, data penderita malaria, Gorontalo Utara

[11] Notoadmodjo, S. 2007. " Perilaku Kesehatan". Rineka Cipta. Jakarta.

[12] Puskesmas Sumalata Timur, 2017, Data penderita malaria, Gorontalo Utara.